



Course program and reading list

Semester 1 Year 2020

School: Sammy Ofer School of Communications M.A.

Psychological Foundations for HCI: Cognitive and Social Psychology

Lecturer:

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Course No.:	Course Type :	Weekly Hours :	Credit:
2876	Lecture	2	2

Course Requirements :	Group Code :	Language:
Final Paper	201287600	English

 Course Description

This course is organized in 2 parts: The first half of the course is on the Social Psychological Foundations of HCI (taught by Dr. Beatrice Hasler Lev-Tov) and the second half is on the Cognitive Psychological Foundations of UX (taught by Dr. Jacob Greenshpan).

Part I: Social Psychology Foundations

This course provides an introduction to selected topics and theories in social psychology that are relevant for HCI researchers and designers:

1. The (Social) Self: self-concept, self-esteem, personality, self-serving biases, self-perception, social comparison, cognitive dissonance theory
2. Persuasion and Social Influence: social learning theory, social contagion, conformity (skip minority influence), compliance, obedience to authority, elaboration likelihood model, characteristics of the source and characteristics of the message, relationship between attitudes and behavior
3. Interpersonal Relations and Nonverbal Behavior: need to belong, proximity, similarity-attraction, causal attributions in person perception, fundamental attribution error, impression formation, thin slices of behavior, theory of mind, mimicry and liking, emotional contagion, proxemics (personal space and interpersonal distance), nonverbal social norms
4. Group Processes: cooperation in groups, performance in a social context, deindividuation, social learning theory, audience and co-action effects, social facilitation, group decision making, leadership and power, group diversity and faultline theory
5. Prejudice, Stereotypes, and Discrimination: (explicit and implicit) prejudice, stereotyping, discrimination, ultimate attribution error, ingroup bias, stereotype threat, social identity threat, intergroup conflict, contact hypothesis, perspective-taking
6. Prosocial Behavior: altruism and basic motives for helping, social and emotional triggers for helping (similarity and prejudice, empathy gap, causal attributions, priming prosocial feelings and behavior, why people fail to help (bystander effect)

Course goals:

The students will be able to identify important social issues, analyze social situations and their underlying psychological processes, and apply this knowledge in the design and evaluation of HCI applications that support social interactions or behavior change, and in human-robot/agent interaction design.

Course structure:

The course is composed of six lectures and corresponding reading materials on selected topics and theories in social psychology, focusing on the interplay between attitudes, emotions and behavior in (non-technological) social contexts. In the assignments the students will apply the acquired theoretical knowledge in interactive media contexts, such as social media, mobile apps, games, virtual and augmented reality, social robotics, and smart objects.

Course details:

Weekly assignment: The students will (individually) formulate one research question every week on a specific social psychological issue in interactive media contexts related to the weekly course topics. A list of technology-related references will be provided to each weekly topic as a source of inspiration. A selection of the submitted research questions will be discussed in class with a focus on methodology (i.e., how these questions could be empirically tested).

Final paper: The students will write (in pairs) a mock paper on an innovative HCI design and proposed evaluation that addresses one (or multiple) issues discussed in class. This can be a sketch, for example, of a technology designed for attitude or behavior change in a specific domain, or a technology-based application that facilitates group decision-making, etc.

The paper should include: 1) a design sketch of the HCI system and short description of its intended purpose, 2) a description of the method suitable to evaluate the impact of the HCI system (e.g., experimental design), 3) anticipation of results, and 4) discussion of the theoretical and practical implications of the anticipated findings.

Reading assignments: Mandatory readings (selected pages of 1-2 chapters per week), and selective screening (reading the abstract) of HCI-related references and/or searching for additional HCI-related references as part of the weekly assignments. The articles listed under "further reading" provide a deeper understanding and broader perspective on the course topics but are not essential for the understanding of the basic concepts and theories discussed in class.

Part II: Cognitive Psychology Foundations

Humans can do a lot: they can read, listen to music (even compose it), use their mobile phones, drive cars, fly airplanes, and use a variety of products with great success. However, human beings have limitations, as well. Yes, we can order flight tickets online, but we can hardly do it while listening to the news. Sometimes, we find it very hard to use a new app on our phone, and sometimes, we might even get into critical situations while using some products. Most, if not all, of the above examples are all related to a matching. A match between human cognition abilities, and the demands, which the task impose on it. We can order online tickets because our cognitive system enables us to turn a pile of lines and curves into letters, then into meaning, understand what it means, select one flight over the other, and even, enable us to press the right key with the right finger at the right time.

The course will include 6 meetings, 2 academic hours each, in which the following leading

themes will be covered (most will require more than one meeting):

- Human perception system – how do we perceive our visual and auditory input and turn it into something meaningful?
- Human memory system and decision making – how do we make decisions – both aware and (mostly) unaware, regarding product usage?
- Human motor system – how can we manipulate and use application software?

Class #1: Introduction to cognition in the UX world

Content: In this meeting we will discuss the human cognitive performance in conjunction with UX design. This lecture will be accompanied and based on in-depth analysis of selected examples.

Takeaway: Following this class, students will better understand what the role of cognition in UX is, and how it influences the way we use products.

Reading preparation: N/A

Class #2–3: About perception and screen design

Content: These lessons will introduce the topics of human sensation and perception. The way we perceive our environment greatly influences the way we interact with applications. We will learn about some basic limitations and abilities of human perception but will focus on more advanced and in-depth models. Among these, we will learn about SDT (Signal Detection Theory) as a practical model to AI and machine learning interface design.

Takeaway: Following this class, students will better understand the cognitive considerations following UX visual design. Students will be able to better understand cognitive perceptual limitations and abilities.

Reading preparation:

1. Lugmayr, A., Grenfeld, A., & Zhang, D. J. (2017, April). Selected Advanced Data Visualizations: The UX-Machine, Cultural Visualisation, Cognitive Big Data, and Communication of Health and Wellness Data. In Proceedings of the 26th International Conference on World Wide Web Companion (pp. 247-251). International World Wide Web Conferences Steering Committee.
2. Revell, K. M., & Stanton, N. A. (2018). Mental model interface design: putting users in control of home heating. *Building Research & Information*, 46(3), 251-271

Class #4: Detailed design of displays to support learning and memory processes

Content: This lesson will offer an in-depth account of our memory system. Our memory system influences the way we design systems and apps dramatically. In addition, the way we understand applications and products based on our mental models will be discussed.

During these sessions, we will learn about working memory, declarative memory, procedural memory and more. In addition, we will cover some aspects of UX design principles that are crucial to designing memorable interfaces.

Takeaway: Highly practical implementations of knowing our memory system and the limitations in UX design will be covered.

Reading preparation:

Baddeley, A. (1992). Working memory. *Science*, 255(5044), 556-559.

Class #5: Interaction design based on attention consideration

Content: This lesson deals with the human operator's limits and capabilities to dedicate attention to a specific task, divide attention among tasks and shift attention from one task to another. In this class, we will learn how to take account of these limitations into the UX design.

Takeaway: Following this class, students will understand the limitations of human attention, as well as strengths, and learn how to use them in UX design.

Reading preparation:

Xu, P., Sugano, Y., & Bulling, A. (2016, May). Spatio-temporal modeling and prediction of visual attention in graphical user interfaces. In Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (pp. 3299-3310). ACM

Class #6: Emotions and experience

Content: UX is more than ease of use. Our emotional system plays a major role in the way we behave, as well as in shaping our attitudes towards products. Therefore, in these two classes, we will learn what emotions are and how to map these emotions using common UX techniques such as "emotional maps", "empathy maps", and more.

Technics and takeaway: By the end of this class each student will understand what emotions are, and how they should use them as part of their UX design process.

Reading preparation:

Lerner, J. S., & Keltner, D. (2000). Beyond valence: Toward a model of emotion-specific influences on judgement and choice. *Cognition & emotion*, 14(4), 473-493



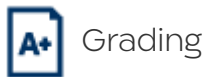
Course Goals

Part I: Social Psychology Foundations

In this course you will learn to identify important social issues, analyze social situations and their underlying psychological processes, and apply this knowledge in the design and evaluation of HCI applications that support social interactions or behavior change, and in human-robot/agent interaction design.

Part II: Cognitive Psychology Foundations

Welcome to the course, which will teach you about the human cognition system, and the way it relates to products design. In this course we will learn how to design systems, which will fit into these human abilities, and make designs, which handles these limitations.



Part I: Social Psychology Foundations

Course requirements:

1. Class attendance and participation
2. Reading the mandatory bibliographical material in preparation for class
3. Submission of weekly assignments (formulating 1 research question) (individual assignment)
4. Submission of a final paper (HCI design sketch and research proposal) (in pairs)

Grade composition:

1. Class participation/attendance and weekly assignments (20%)
2. Final paper (80%)

Part II: Cognitive Psychology Foundations

The students will be asked to fulfill the following:

1. **Class attendance and participation:** it is highly important that all students be present in all classes. Any unjustified and unapproved absence from class will result in a decrease of 5 points from the final grade per lesson according to IDC regulations. In case of two absences or more, the student will be subject to losing the grades or credit for this course.
2. The lecturer may award extra points for exceptional attendance, punctuality and exceptional participation in class and in group assignments along the course.
3. Each student is to submit two short one-page docs, following the end of class #2 and class #4 with two short product's analyses, according to the topics covered. These docs should demonstrate two main themes addressed in class and explain how the design principle applies to it, in a good or bad way.
4. There will be a group assignment of redesigning one main flow of an app / website of your choice, based on the principles learned in class.

The course grade will be calculated as follows:

1. Two product analyses – 10% each.
2. Redesign of one main flow of an app – 80% - will be a group assignment.



Lecturer Office Hours

Social Psychology Foundations:

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Cognitive Psychology Foundations:

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Part I: Social Psychology Foundations

Bibliography:

1. The (Social) Self:

Mandatory reading:

- Greenberg, J., Schmader, T., Arndt, J., & Landau, M. (2015). Social psychology: The science of everyday life. Worth Publishers. Chapters 5 and 6 (selected pages)

Further reading:

- Baumeister, R. F. (1999). The nature and structure of the self: An overview. In R. F. Baumeister (Ed.), *The self in social psychology* (pp. 1–20). Philadelphia: Taylor & Francis Psychology Press.
- Brewer, M. B. (1991). The social self: On being the same and different at the same time. *Personality and Social Psychology Bulletin*, 17(5), 475–482.
- Suls, J., Martin, R., & Wheeler, L. (2002). Social comparison: Why, with whom, and with what effect? *Current Directions in Psychological Science*, 11(5), 159–163.

2. Persuasion and Social Influence:

Mandatory reading:

- Greenberg, J., Schmader, T., Arndt, J., & Landau, M. (2015). Social psychology: The science of everyday life. Worth Publishers. Chapters 7 and 8 (selected pages)

Further reading:

- Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. *Annual Review of Psychology*, 55, 591–621.
- Fazio, R. H. (1990). Multiple processes by which attitudes guide behavior: The MODE model as an integrative framework. *Advances in Experimental Social Psychology*, 23, 75–109.
- Petty, R. E., & Briñol, P. (2012). The elaboration likelihood model. In P. A. M. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology* (pp. 224–245). Thousand Oaks, CA: Sage Publications.

3. Interpersonal Relations and Nonverbal Behavior:

Mandatory reading:

- Greenberg, J., Schmader, T., Arndt, J., & Landau, M. (2015). Social psychology: The

science of everyday life. Worth Publishers. Chapters 4 and 14 (selected pages)

Further reading:

- Ambady, N., & Rosenthal, R. (1992). Thin slices of expressive behavior as predictors of interpersonal consequences: A meta-analysis. *Psychological Bulletin*, 111(2), 256-274.
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117(3), 497-529.
- Chartrand, T. L., & Van Baaren, R. (2009). Human mimicry. *Advances in Experimental Social Psychology*, 41, 219-274.
- Hatfield, E., Cacioppo, J. T., & Rapson, R. L. (1993). Emotional contagion. *Current Directions in Psychological Science*, 2(3), 96-100.
- Hayduk, L. A. (1983). Personal space: Where we now stand. *Psychological Bulletin*, 94(2), 293-335.

4. Group Processes:

Mandatory reading:

- Greenberg, J., Schmader, T., Arndt, J., & Landau, M. (2015). *Social psychology: The science of everyday life*. Worth Publishers. Chapter 9 (selected pages)

Further reading:

- Van Knippenberg, D., De Dreu, C. K., & Homan, A. C. (2004). Work group diversity and group performance: An integrative model and research agenda. *Journal of Applied Psychology*, 89(6), 1008-1022.
- Woolley, A. W., Chabris, C. F., Pentland, A., Hashmi, N., & Malone, T. W. (2010). Evidence for a collective intelligence factor in the performance of human groups. *Science*, 330, 686-688.

5. Prejudice, Stereotypes, and Discrimination:

Mandatory reading:

- Greenberg, J., Schmader, T., Arndt, J., & Landau, M. (2015). *Social psychology: The science of everyday life*. Worth Publishers. Chapters 10 and 11 (selected pages)

Further reading:

- Hewstone, M., Rubin, M., & Willis, H. (2002). Intergroup bias. *Annual Review of Psychology*, 53(1), 575-604.
- Brown, R., & Hewstone, M. (2005). An integrative theory of intergroup contact. *Advances in Experimental Social Psychology*, 37(37), 255-343.
- Čehajić-Clancy, S., Goldenberg, A., Gross, J. J., & Halperin, E. (2016). Social-psychological interventions for intergroup reconciliation: An emotion regulation

perspective. *Psychological Inquiry*, 27(2), 73–88.

- Lai, C. K., Marini, M., Lehr, S. A., et al. (2014). Reducing implicit racial preferences: I. A comparative investigation of 17 interventions. *Journal of Experimental Psychology: General*, 143(4), 1765–1785.
- Todd, A. R., & Galinsky, A. D. (2014). Perspective-taking as a strategy for improving intergroup relations: Evidence, mechanisms, and qualifications. *Social and Personality Psychology Compass*, 8(7), 374–387.

6. Prosocial Behavior:

Mandatory reading:

- Greenberg, J., Schmader, T., Arndt, J., & Landau, M. (2015). *Social psychology: The science of everyday life*. Worth Publishers. Chapter 13 (selected pages)

Further reading:

- Batson, C. D., Fultz, J., & Schoenrade, P. A. (1987). Distress and empathy: Two qualitatively distinct vicarious emotions with different motivational consequences. *Journal of Personality*, 55(1), 19–39.
- Cialdini, R. B., Brown, S. L., Lewis, B. P., Luce, C., & Neuberg, S. L. (1997). Reinterpreting the empathy–altruism relationship: When one into one equals oneness. *Journal of Personality and Social Psychology*, 73(3), 481.

Part II: Cognitive Psychology Foundations

Class #1: Introduction to cognition in the UX world

Reading preparation: N/A

Class #2–3: About perception and screen design

Lugmayr, A., Grenfeld, A., & Zhang, D. J. (2017, April). Selected Advanced Data Visualizations: The UX-Machine, Cultural Visualisation, Cognitive Big Data, and Communication of Health and Wellness Data. In *Proceedings of the 26th International Conference on World Wide Web Companion* (pp. 247–251). International World Wide Web Conferences Steering Committee.

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