

PG 8510: CONTEXT AND CONSEQUENCES OF BEHAVIOR.

COURSE SYLLABUS REVISED

Christopher Newland, Ph.D.
(Spring, 2006)

Course: PG 8510. Context and Consequences of Behavior.
Prerequisites: Conditioning and Learning.
Meeting Times: Room 202 Thach Hall
Monday, Wednesday. 1:00 – 3:00
Text: Readings from the primary and secondary literature. Available on WebCT
Instructor: Christopher Newland, Ph.D.
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Overview and Course Objectives. We will examine the roles that the consequences of behavior, and the context in which behavior occurs, play in its acquisition, maintenance, and structure. As befits a graduate seminar we will work on the assumption that you have some background knowledge of the principles of operant and respondent conditioning. We will spend much time on mechanism, methods, measurement, and quantification, all of which lie behind the phenomena covered in more elementary courses. We will examine some of the integrative theories, including the matching relation. Topics will include response differentiation and induction, the generation of complex response units, contextual control, stimulus equivalence, choice, molecular determinants of behavior, mathematical models of behavior, and the dynamics of behavior during transition states.

We will examine some approaches to linking the analysis of behavior to neural function. This will occur in several places through the course, where topics that we cover at the level of behavior will be extended to some aspect of nervous system function. Toward the end of the course will spend a week or so on neural mechanisms of choice, an area that might provide an interesting nexus of two bodies of literature.

Course Structure. The course will be structured as a seminar based upon the primary literature and focused literature reviews. Through the course of the term we will review the topics and papers listed on the syllabus. For some topics, a review has been identified that covers the literature and current thinking on a topic. The instructor will cover these, unless someone is interested in doing so. This is encouraged since it's an excellent way to learn the material. The reviews are thematic, generally have a theoretical position to advance, and are grounded in data. Indeed, many of them present experiments in some detail. Therefore, we will let the review summarize a topic and provide a perspective on it. Some papers from the primary literature will also be covered during a section. These will be papers representing the experimental approach to a topic, or they will be recent papers on a topic.

Where it is helpful, I will introduce an area by leading a discussion of a review in class. All other papers will be presented by students. Come to class prepared to discuss the literature reviews and papers. Primary papers (reports of experiments) will be presented by students. In most cases we will devote 40 minutes to each paper. Presenters must organize the presentation carefully in order to present the key points, promote and leave time for discussion. By this I mean that you should be able to present the authors' rationale, the methods, results, and

conclusions with skeletal notes. *Do not read highlighted sections directly from the paper.* Powerpoint is available if you find it helpful, but focus on content, not pizzazz. We want the steak, not the sizzle.

In your discussion of a topic be thorough, concise, and clear. Try the "*tell'em*" strategy: "tell 'em what your going to tell 'em, tell 'em, and tell 'em what you told 'em." Set up each paper by summarizing what question is being addressed, why it is an important question, and the methods used to address it, what was found, and what it says about structure and mechanism of behavior. *It is the presenter's responsibility to provide the background material required to understand the paper.* This usually means consulting a good conditioning text or, sometimes, going to the library to read papers referred to prominently. Keep all discussion focused on what was done, what happened, and how this was interpreted. Describe all procedures carefully: say what was done and what happened. *Always* place all behavior in the context of the environmental events such as three-term contingency of reinforcement or the contingencies of respondent conditioning. This may be difficult at first, but maintaining a focus on behavior-environment interactions is worth the effort. **We will not tolerate folksy descriptions of behavior**, but instead, will respect the spirit of Lloyd Morgan's canon:

In no case may we interpret an action as the outcome of the exercise of a higher psychical faculty, if it can be interpreted as the outcome of the exercise of one which stands lower in the psychological scale. (From Morgan, C.L. (1894), *An Introduction to Comparative Psychology*. London: Walter Scott.)

Everybody *not* presenting a paper or review should submit at least one question, comment, extension, or interpretation of the papers to be covered. These should be submitted by 11:00 A.M. on the day of class. These can be submitted on the WebCT page I set up for this course. If something is confusing or needs clarification then ask it. Presenters should review these items before class. Questions questions/observations may be read to the class to promote discussion. Good questions will be those that generate discussion.

Evaluation. Course grade will be a simple average of *four* equally-weighted grades The *first two* grades will be papers, one due on 13 March and the second due on 26 April. These should be about 15 pages in length and may be one of three things: 1) An investigation into an area in more detail than we covered in class or 2) an extension of a topic into an area that interests you or 3) an investigation of a topic in the experimental analysis of behavior that we do not cover on the syllabus. Unless you choose 3 as an option, the paper should be on a topic covered in the course segment that preceded the due date (for the second paper, it could be something subsequent). You should discuss a topic with me before you get started. Please do some background work before discussing it with me. The papers **MUST** draw from the primary and secondary literature and must emphasize behavior-environment interactions. With regard to the latter, other mechanisms can certainly be examined as a secondary theme and they must be well characterized mechanisms. A *third* grade will come from the quantity and quality of questions/comments that you turn in and your participation (quality and quantity) of in the seminar. Note that participation in the seminar is heavily weighted. The *fourth* grade will be based your presentations.

Following are some of the criteria used to evaluate the presentations:

- Clear and succinct description of the research question and coverage of the points listed above.
- Clear description of the methods. (*important* details, not all details).
- Graphical presentation of the results. Whether you use the board, powerpoint, or the overhead projector is up to you. If you use powerpoint, avoid floral, distracting slides. Keep in simple, clear, and clean. Data matter. *Fleur de lis* don't.

- Presentation of the author's conclusions.
- The extent to which you go beyond the paper and incorporate what you know, or what you are learning in this course. This can be in the form of critical comment on weaknesses, unanswered questions raised, further research prompted by this experiment, or extensions to understanding human behavior or application.

Following are some of the criteria for evaluating participation of those not presenting:

- Clear evidence that you have read the paper.
Questions asked and points of discussion raised.
- Insights about how two or more of the papers tie together (especially relevant for those with no responsibilities to present during a class).
- Participation in discussion.

Students with Disabilities. Students with a disability documented by Auburn's Program for Students with Disabilities should schedule a meeting with me early in the term. I will work with the student to meet the accommodations recommended by the Program for Students with Disabilities.

PG 636 BEHAVIOR AND ITS CONSEQUENCES				
Daily Schedule (Spring 2006)				
Class Date	Class Number	Topic	Readings	Presenter
Monday 9-Jan- 2006	1	The selectionistic view of behavior	[1]	Class
Response Differentiation and Induction				
12 Jan		The physical properties of the operant Characteristics of complex response units.	[2] [3]	Schmidtke Newland
Monday 16 Jan	2	No class. Martin Luther King holiday.		
19 Jan	3	Operant variability	[4, 5, 6, 7]	Pesek, Brandt, Polick
Monday 23 Jan	4	The role of reinforcement contingencies.	[8] [9]	Johnson Newland
25-Jan	5	Overflow		
Contextual Control Over Behavior				
Monday 30 Jan	6	Stimulus equivalence	[10] [11]	Suits Irons
1 Feb	7	Typicality in Stimulus equivalence	[12, 13]	Schmidtke Schmidtke
Monday 6 Feb	8	Language acquisition	[14, 15]	Suits Polick
8 Feb	9	Complex response units.	[16] [17]	Newland Irons
Aversive Control				
Monday 13 Feb	10	Introductory comments Maintenance by shock-frequency reduction	[18] [19]	Newland (intro) Pesek Johnson

Monday 15 Feb	11	Safety signals and other stimuli.	[20] [21]	Brandt Polick
Choice				
Monday 20 Feb	12	The strict matching relation and its limits of applicability.	[22] [23]	Newland Suits
22 Feb	13	The generalized matching relation.	[24] [25] [26]	Newland Irons
Monday 27 Feb	14	Matching and the reinforcement of switching	[27] [28]	
1 Mar	15	Contextual control and choice.	[29] [30]	Brandt Schmidtke
Monday 6 Mar	15	NO CLASS/ SOT		
8 March	16	NO CLASS/SOT		
Quantifying the Behavioral Stream				
Monday 13 Mar	16	First Paper Due Behavior as Engagement Bouts.	[31, 32, 33, 34]	Johnson Newland
Contextual Control				
15 Mar	17	Choice and remembering	[35]	Pesek
Monday 20 Mar	18	Choice and remembering	[36] [37]	Johnson Suits
Acquisition and Cortical Mechanisms				
22 Mar	19	Choice in a variable environment.	[38] [55]	Irons Irons
27 Mar (spring break)	20	Cortical and striatal mechanisms	[39] [40]	Polick Pesek
Social Behavior				
Monday		Allocation of individuals by	[41, 42]	

3 Apr	21	groups.		Schmidtke Brandt
5 Apr	22	Reinforcement of modeling	[43]	Suits
Behavioral Momentum and Behavioral Economics				
Monday 10 Apr	23	Behavioral momentum Begin Behavioral Economics	[44]	Polick Newland
12 Apr	24	Behavioral economics.	[45, 46]	
Monday 17 Apr	25	Behavioral Economics: Experimental Approach	[47] [48]	Irons Pesek
19 Apr	26	Behavioral economics. Labor Supply and contingencies	[49]	Brandt
Monday 24 Apr	27	Delay Discounting	[50] [51]	Schmidtke Johnson
26 Apr	28	Delay Discounting Second Paper Due	[52]	Polick
Some Other Developments.				
Monday 1 May	29	Habituation and reinforcers.	[53]	Pesek
8:00 a.m. THURSD AY, 3 MAY	FINAL EXAM DAY.	An integrated theory, con't.	[54]	Class.

1. Skinner, B. F. (1981). Selection by consequences. *Science*, 213(4507), 501-504.
2. Eckerman, D. A., Hienz, R. D., S. S., & Kowlowitz, V. (1980). Shaping the location of pigeon's peck: Effect of rate and size of shaping steps. *Journal of the Experimental Analysis of Behavior*, 33, 299-310.
3. Marr, M. J. (1979). Second-order schedules and the generation of unitary response sequences. In M. D. Zeiler & P. Harzem (Eds.), *Advances in the analysis of behavior. Vol 1. Reinforcement and the organization of behavior.* (pp. 223-260). New York: Wiley.
4. Page, S., & Neuringer, A. (1985). Variability is an operant. *Journal of Experimental Psychology: Animal Behavior Processes*, 11, 429-452.
5. Neuringer, A., Kornell, N., & Olufs, M. (2001). Stability and variability in extinction. *Journal of Experimental Psychology: Animal Behavior Processes*, 27(1), 79-94.

6. Neuringer, A. (2002). Operant variability: Evidence, functions, and theory. *Psychonomic Bulletin & Review*, 9(4), 672-705.
7. Neuringer, A. (2004). Reinforced variability in animals and people: Implications for adaptive action. *American Psychologist*, 59(9), 891-906.
8. Kuch, D. O., & Platt, J. R. (1976). Reinforcement rate and interresponse time differentiation. *Journal of the Experimental Analysis of Behavior*, 26(3), 471-486.
9. Galbicka, G., & Platt, J. R. (1984). Interresponse-time punishment: A basis of shock-maintained behavior. *Journal of the Experimental Analysis of Behavior*, 41, 291-308.
10. Sidman, M., Wynne, C. K., Maguire, R. W., & Barnes, T. (1989). Functional classes and equivalence relations. *Journal of the Experimental Analysis of Behavior*, 52, 261-274.
11. DeGrandpre, R. J., Bickel, W. K., & Higgins, S. T. (1992). Emergent equivalence relations between interoceptive (drug) and exteroceptive (visual) stimuli. *Journal of the Experimental Analysis of Behavior*, 58(1), 9-18.
12. Galizio, M., Stewart, K. L., & Pilgrim, C. (2001). Clustering in artificial categories: An equivalence analysis. *Psychonomic Bulletin & Review*, 8(3), 609-614.
13. Galizio, M., Stewart, K. L., & Pilgrim, C. (2004). Typicality effects in contingency-shaped generalized equivalence classes. *Journal of the Experimental Analysis of Behavior*, 82(3), 253-273.
14. Lowe, C. F., Horne, P. J., Harris, F. D., & Randle, V. R. (2002). Naming and categorization in young children: Vocal tact training. *Journal of the Experimental Analysis of Behavior*, 78(3), 527-549.
15. Lowe, C. F., Horne, P. J., & Hughes, J. C. (2005). Naming and categorization in young children: Iii. Vocal tact training and transfer of function. *Journal of the Experimental Analysis of Behavior*, 83(1), 47-65.
16. Newland, M. C., & Marr, M. J. (1985). The effects of chlorpromazine and imipramine on rate and stimulus control of matching to sample. *Journal of the Experimental Analysis of Behavior*, 44, 49-68.
17. Thompson, D. M., & Moerschbaecher, J. M. (1979). An experimental analysis of the effects of d-amphetamine and cocaine on the acquisition and performance of response chains in monkeys. *Journal of the Experimental Analysis of Behavior*, 32, 433-444.
18. Perone, M., & Galizio, M. (1987). Variable-interval schedules of timeout from avoidance. *Journal of the Experimental Analysis of Behavior*, 47, 97-113.
19. Herrnstein, R. J., & Hineline, P. N. (1966). Negative reinforcement as shock-frequency reduction. *Journal of the Experimental Analysis of Behavior*, 9, 421-430.
20. Badia, P., Harsh, J., Coker, C. C., & Abbott, B. (1976). Choice and the dependability of stimuli that predict shock and safety. *Journal of the Experimental Analysis of Behavior*, 26, 95-111.
21. Mueller, K. L., & Dinsmoor, J. A. (1984). Testing the reinforcing properties of s-: A replication of lieberman's procedure. *Journal of the Experimental Analysis of Behavior*, 41(1), 17-25.
22. Herrnstein, R. J. (1970). On the law of effect. *Journal of the Experimental Analysis of Behavior*, 13, 243-266.
23. McDowell, J. J., & Dallery, J. (1999). Falsification of matching theory: Changes in the asymptote of herrnstein's hyperbola as a function of water deprivation. *Journal of the Experimental Analysis of Behavior*, 72(2), 251-268.
24. Baum, W. M. (1979). Matching, undermatching, and overmatching in studies of choice. *Journal of the Experimental Analysis of Behavior*, 32(2), 269-281.
25. Baum, W. M. (1974). On two types of deviation from the matching law: Bias and undermatching. *Journal of the Experimental Analysis of Behavior*, 22, 231-242.
26. Baum, W. M., & Rachlin, H. C. (1969). Choice as time allocation. *Journal of the Experimental Analysis of Behavior*, 12, 861-874.

27. MacDonall, J. S. (2000). Synthesizing concurrent interval performances. *Journal of the Experimental Analysis of Behavior*, 74(2), 189-206.
28. MacDonall, J. S. (2003). Reinforcing staying and switching while using a changeover delay. *Journal of the Experimental Analysis of Behavior*, 79(2), 219-232.
29. Miller, H. L. (1976). Match-based hedonic scaling in the pigeon. *Journal of the Experimental Analysis of Behavior*, 26, 335-347.
30. Alsop, B., & Davison, M. (1991). Effects of varying stimulus disparity and the reinforcer ratio in concurrent schedule and signal-detection procedures. *Journal of the Experimental Analysis of Behavior*, 56, 67-80.
31. Shull, R. L. G., Scott T; Grimes, Julie A. (2001). Response rate viewed as engagement bouts: Effects of relative reinforcement and schedule type. *Journal of the Experimental Analysis of Behavior*, 75(3), 247-274.
32. Shull, R. L., Gaynor, S. T., & Grimes, J. A. (2002). Response rate viewed as engagement bouts: Resistance to extinction. *Journal of the Experimental Analysis of Behavior*, 77(3), 211-231.
33. Shull, R. L. (2004). Bouts of responding on variable-interval schedules: Effects of deprivation level. *Journal of the Experimental Analysis of Behavior*, 81(2), 155-167.
34. Shull, R. L. (2005). The sensitivity of response rate to rate of variable-interval reinforcement for pigeons and rats: A review. *Journal of the Experimental Analysis of Behavior*, 84(1), 99-109.
35. McCarthy, D. C., & Davison, M. D. (1991). The interaction between stimulus and reinforcer control on remembering. *Journal of the Experimental Analysis of Behavior*, 86, 51-66.
36. White, K. G., & Wixted, J. T. (1999). Psychophysics of remembering. *Journal of the Experimental Analysis of Behavior*, 71(1), 91-113.
37. White, K. G., & McKenzie, J. (1982). Delayed stimulus control: Recall for single and relational stimuli. *Journal of the Experimental Analysis of Behavior*, 38(3), 305-312.
38. Davison, M., & Baum, W. M. (2000). Choice in a variable environment: Every reinforcer counts. *Journal of the Experimental Analysis of Behavior*, 74(1), 1-24.
39. Tremblay, L., & Schultz, W. (1999). Relative reward preference in primate orbitofrontal cortex.[comment]. *Nature*, 398(6729), 704-708.
40. Salamone, J. D., Arizzi, M. N., Sandoval, M. D., Cervone, K. M., & Aberman, J. E. (2002). Dopamine antagonists alter response allocation but do not suppress appetite for food in rats: Contrast between the effects of skf 83566, raclopride, and fenfluramine on a concurrent choice task. *Psychopharmacology*, 160(4), 371-380.
41. Baum, W. M., & Kraft, J. R. (1998). Group choice: Competition, travel, and the ideal free distribution. *Journal of the Experimental Analysis of Behavior*, 69, 227-245.
42. Bell, K. E., & Baum, W. M. (2002). Group foraging sensitivity to predictable and unpredictable changes in food distribution: Past experience or present circumstances? *Journal of the Experimental Analysis of Behavior*, 78(2), 179-194.
43. Howard, M. L., & White, K. G. (2003). Social influence in pigeons (*columba livia*): The role of differential reinforcement. *Journal of the Experimental Analysis of Behavior*, 79(2), 175-191.
44. Nevin, J. A., Mandell, C., & Atak, J. R. (1983). The analysis of behavioral momentum. *Journal of the Experimental Analysis of Behavior*, 39, 49-59.
45. Madden, G. J. (2000). A behavioral economics primer. In W. K. Bickel & R. E. Vuchinich (Eds.), *Reframing health behavior change with behavioral economics* (pp. 3-26). Mahwah, NJ: Erlbaum.
46. Hursh, S. R. (2000). Behavioral economic concepts and methods for studying health behavior. In W. K. Bickel & R. E. Vuchinich (Eds.), *Reframing health behavior change with behavioral economics* (pp. 27-62). Mahwah, NJ: Erlbaum.

47. Collier, G., Johnson, D. F., & Morgan, C. (1992). The magnitude-of-reinforcement function in closed and open economies. *Journal of the Experimental Analysis of Behavior*, *57*, 81-89.
48. Rodefer, J. S., & Carroll, M. E. (1996). Progressive ratio and behavioral economic evaluation of the reinforcing efficacy of orally delivered phencyclidine and ethanol in monkeys: Effects of feeding conditions. *Psychopharmacology*, *128*(3), 265-273.
49. Madden, G. J., Dake, J. M., Mauer, E. C., & Rowe, R. R. (2005). Labor supply and consumption of food in a closed economy under a range of fixed- and random-ratio schedules: Tests of unit price. *Journal of the Experimental Analysis of Behavior*, *83*(2), 99-118.
50. Ainslie, G., & Monterosso, J. R. (2003). Building blocks of self-control: Increased tolerance for delay with bundled rewards. *Journal of the Experimental Analysis of Behavior*, *79*(1), 37-48.
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54. Davison, M., & Nevin, J. A. (1999). Stimuli, reinforcers, and behavior: An integration. *Journal of the Experimental Analysis of Behavior*, *71*(3), 439-482.
55. Davison, M., & Baum, W. M. (2003). Every reinforcer counts: Reinforcer magnitude and local preference. *Journal of the Experimental Analysis of Behavior*, *80*(1), 95-129.