

# The Psychology of Time

Psychology 220  
Spring 2015  
Haverford College

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**Course Description:** Time is often referred to as “the tacit dimension” within psychology because unlike other types of perception, it is not directly available to any sensory organ but can only be apprehended through change and the dynamic flow of environmental events. And yet despite its ephemeral nature, time is a dimension that has a significant impact upon a wide variety of psychological behavior. The intent of this course is to examine some of the ways in which this occurs.

From a structural perspective, it can be demonstrated that events in the world around us display a high degree of temporal organization at all levels of analysis. Many of the body’s physiological processes are entrained to the circadian day-night cycle and the pattern of sleep/wakefulness which, in turn, influences many behaviors and our overall level of functioning. In addition, many of the events we frequently encounter display a spatial array that is structured in and over time. Music, speech, body movements, and walking gaits are among the many events in which the sequence of notes, words, or actions unfold with a characteristic rhythm and tempo over a given time span. This particular arrangement not only influences how an event is perceived and remembered, but also the overall accuracy with which the event’s velocity and total duration are subsequently judged. Beyond this more micro-level, temporal patterning can also be identified within more global and social frameworks of life. The types of activities we perform in everyday existence vary in cyclic patterns over the course of a day, week, and year and thereby provide a scheduling scheme that serves to coordinate subpopulations of individuals. Different cultures have different conceptualizations of time which can be reflected in the types of metaphors used to describe time as well as the overall pace of life.

Another dimension which exerts a major influence upon everyday behavior is temporal perspective and one’s relative orientation toward the past, present, and future. Many clinical psychologists argue that this orientation is central to one’s mental well-being and the degree of ego strength displayed in coping with life’s difficulties. Indeed, it has been found that disturbances in temporal perspective are correlated with both delinquent and criminal behavior and certain forms of mental illness.

Lastly, the neural substrates of different types of temporal behavior will be examined. In general, the mechanisms mediating circadian-driven behaviors are quite different from those governing the internal clock and sensitivity to an event’s duration and overall velocity. This is perhaps most apparent in the analysis of timing disorders due to certain diseases and brain trauma that affect certain areas of the cerebral cortex.

## **Grading:**

Classroom Participation and Discussion	10%
Exam I	25%
Class Presentation	15%
Exam II	25%
Final Paper	25%

# Lecture Outline

## I. Overview

- a. Various manifestations of psychological time
- b. Brief history of time-keeping - psychological impact of clocks

### Readings:

- Andrewes, W.J. (2006). A chronicle of timekeeping. *Scientific American*, 16, 46-55.

## II. Rhythm

- a. Chronobiology: Circadian and biological rhythms
  1. rhythmicities of sleep – different stages, why do we need it?
  2. studies of time isolation: free running rhythms and zeitgebers
  3. chronotypes: larks vs. owls
  4. neural basis of biological clock
  5. practical applications of circadian research
    - jet lag
    - workers' shifts
    - medicine and pharmacology
    - cyclic variations in suicide
    - sleep disorders
    - SAD
- b. Rhythm in Environmental Events: Basic principles of rhythmic organization and production
  1. grouping rules
  2. accents
  3. biases in rhythm perception
  4. modality differences
- c. An example of rhythmic organization within environmental events:
  1. locomotion and walking gaits; biological motion
- d. Some cognitive functions of rhythm
- e. Environmental manifestations of synchrony – fireflies, menstrual cycles, and Pokemon

### Class Presentation: Circadian disturbances within mental illness

### Readings:

- Palmer, J. (2002). Selected chapters from *The Living Clock*. New York: Oxford University Press.  
  
Chapter 2 – Human Rhythms: Basic Processes  
Chapter 3 – Rhythmic Pharmacology  
Chapter 4 – Jet Lag Can Be a Drag
- Phillips, M. L. (2009). Of owls, larks, and alarm clocks. *Nature*, 458, 142-144.
- Alward, R. R. (1988). Are you a lark or an owl on the night shift? *The American Journal of Nursing*, 88, 1336-1339.
- Wright, K. (2006). Times of our lives. *Scientific American*, 16, 26-33.
- Boltz, M.G. (1992). Temporal accent structure and the remembering of filmed narratives. *Journal of Experimental Psychology: Human Perception and Performance*, 18, 90-105.

### III. Role of Rhythm in Language and Social Cognition

- a. Temporal structure of speech and language
  1. Rhythmic structure in the articulation of phonemes, words, sentences
  2. Effects on cognitive behavior
- b. Temporal coordination in conversational interaction
  1. Turn-taking behavior
  2. Interactional synchrony
  3. Speaker accommodation and congruence
  4. Applications to doctor-patient interactions
- c. Social impressions derived from temporal qualities of the voice

**Class Presentation: Temporal metaphors and referential time.**

#### Readings:

- Krauss, R.M. & Chiu, C. (1998). Language and social behavior. In D.T. Gilbert, S.T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology*. (pp. 41-88). McGraw-Hill: New York. **Only read from page 58 (beginning with section on “Language and Social Perception”) to page 67 (up to section on “Language and Gender”).**
- Condon, W. (1986). Communication, rhythm, and structure. In J. Evans & M. Clynes (Eds.), *Rhythm in psychological, linguistic, and musical processes*. (pp. 55-77). Charles Thomas Publishers: Springfield, Illinois.
- Bernieri, F.J. & Rosenthal, R. (1991). Interpersonal coordination: Behavior matching and interactional synchrony. In R.S. Feldman & R. Rime (Eds.), *Fundamentals of nonverbal behavior*. (pp. 401-432). Cambridge University Press: NY, NY.
- Boroditsky, L. & Ramscar, M. (2002). The roles of body and mind in abstract thought. *Psychological Science*, 13, 185-189.

### IV. Tempo

- a. Limits on perception - a range of tempo sensitivity
- b. Cognitive processing of tempo information:
  1. tempo preferences
  2. memory for tempo information
  3. tempo perception - some applications to errors in automobile driving
- c. Relationship between time and space - kappa/tau effects; tempo illusions
- d. Internal tempo
- e. Cross-cultural variations in the pace of life

**Class Presentation: Acceleration of time due to technology and its effects on psychological behavior**

#### Readings:

- Ono, A. (1976). A study of the literature on the interrelations between subjective time, distance, and speed. *Tohoku Psychologica Folia*, 35, 1-11.
- Levine, R. (1996). Cultural differences in the pace of life. In H. Helfrich (Ed.) *Time and Mind*. Hogrefe & Huber Publishers: Göttingen.

- Selected chapters from: Gleick, J. (1999). *Faster: The acceleration of just about everything*. Vintage Books: New York
1. Life as a Type A
  2. Pacemaker
  3. On Your Mark, Get Set, Think!
  4. Eat and Run
  5. How Many Hours Do You Work?

## V. Event Duration

- a. Research paradigm - prospective vs. retrospective
- b. Behavioral measures of event duration: tasks and measures of accuracy and directional bias
- c. Models of Experienced Duration - Prospective Timing
  1. Internal Clock
  2. Attentional Gate - impact of attentional variables and arousal
- d. Models of Remembered Duration - Retrospective Timing
  1. Memory-Based Models:
    - Storage Size Hypothesis
    - Cognitive Change Hypothesis
  2. Shortcomings and Limitations
  3. Structural Remembering Approach - the influence of event structure, learning, and expectancies; predicted duration estimates
  4. A modified version of the attentional gate model

### Class Presentation: Temporal judgments in sports.

#### Readings:

- Zakay, D. & Block, R. (1997). Temporal cognition. *Current Directions in Psychological Science*, 6, 12-16.
- Boltz, M.G. (1998). The role of learning in remembered duration. *Memory & Cognition*, 26, 903-921.
- Buehler, R., Griffin, D. & Ross, M. (2002). Inside the planning fallacy: The causes and consequences of optimistic time prediction. In R. Gilovich, D. Griffin & D. Kahneman (Eds.), *Heuristics and biases: The psychology of intuitive judgment*. (pp. 250-270). Cambridge University Press: NY.
- Hancock, P.A. & Weaver, J.L. (2005). On time distortions under stress. *Theoretical Issues in Ergonomics Science*, 6(2), 193-211.
- Boltz, M.G. (1998). The relationship between internal and external determinants of time estimation behavior. In V. DeKeyser, G. d'Ydewalle, & A. Vandierendonck (Eds.), *Time and the dynamic control of behavior*. Hogrefe & Huber Publishers: Göttingen, Germany.
- Wallisch, P. (2008). An odd sense of timing. *Scientific American Mind*, 37-43.

## VI. Temporal Perspective

- a. Components of experiential time within the self
- b. The multidimensional nature and measurement of temporal perspective
- c. Correlates of future-orientation
- d. Changes across the life-span
- e. Disturbances of temporal perspective due to:
  1. hypnosis
  2. delinquency
  3. mental illness

**Class Presentation: Psychological distance and temporal construal.**

### Readings:

- Boniwell, I. & Zimbardo, P.G. (2004). Balancing time perspective in pursuit of optimal functioning. In P.A. Linley & S. Joseph (Eds.), *Positive psychology in practice*. (pp. 165-178). John Wiley & Sons: Hoboken, NJ.
- Boyd, J.N. & Zimbardo, P.G. (2005). Time perspective, health, and risk taking. In A. Strathman & J. Joireman (Eds.), *Understanding behavior in the context of time*. Erlbaum Press.
- Melges, F.T. (1989). Disorders of time and the brain in severe mental illness. In J.T. Fraser (Ed.) *Time and mind: Interdisciplinary issues. The study of time VI*. Madison, CT: International Universities Press, Inc.
- Melges, F.T. (1982). Time and the future in psychopathological spirals. From *Time and the Inner Future*. John Wiley: NY.

## VII. Role of Time in Autobiographical Memory

- a. Autobiographical memory and its relationship to other memory systems
- b. The temporal organization of personal memories:
  1. The use of temporal reference frames in remembering
  2. The “bump” of autobiographical memory
  3. Childhood amnesia
- c. Event dating:
  1. Factors influencing the accuracy of event dating
  2. Reconstructive processes through temporal schemas and landmarks
  3. Public memories of news events
- d. Prospective memory

**Class Presentation: The development of temporal concepts in children.**

### Readings:

- Smyth, M., Collins, A., Morris, P. & Levy, P. (1994). Memory of your past, in the present and for the future. (pp. 281-291). From *Cognition in action*. Erlbaum: Hillsdale, N.J.
- Rubin, D. (2002). Autobiographical memory across the lifespan. In P. Graf & N. Ohta (Eds.) *Lifespan development of human memory*. (pp. 159-184). MIT Press.
- Larsen, S.F., Thompson, C.P. & Hansen, T. (1996). Time in autobiographical memory. In D. Rubin (Ed.). *Remembering our past*. (pp. 129-156). Cambridge University Press: NY, NY.

- Wilson, A. E. & Ross, M. (2003). The identity function of autobiographical memory: Time is on our side. *Memory*, 11, 137-149.
- Wilson, A.E., Gunn, G.R., & Ross, M. (2009). The role of subjective time in identity regulation. *Applied Cognitive Psychology*, 23, 1164-1178.

## VIII. Society's Influence on Experienced Time

- Monochronic vs. Polychronic Societies
- Social time from three cultural perspectives:
  - Linear Model
  - Circular Model
  - Procedural Model
- Utilitarian concept of time – time as an economic resource
- Applications to consumer research
- Time as embedded within social organizations
  - Various forms of temporal regularity within social systems
  - The stratification of self time, interaction time, and institutional time
- Perceptions of protracted duration within social events

### Class Presentation: Time and art.

#### Readings:

- Radden, G. (2004). The metaphor TIME AS SPACE across languages. In N. Baumgarten et al. (Eds.), *Übersetzen, interkulturelle Kommunikation, Spracherwerb und Sprachvermittlung—Das Leben mit Mehreren Sprachen: Festschrift für Juliane House zum 60. Geburtstag* (pp. 225-238). Bochum: Aks-verlag.
- Lewis, J.D. & Weigert, A.J. (1981). The structures and meanings of social time. *Social Forces*, 60, 432-462.
- Ezzell, C. (2006). Clocking cultures. *Scientific American*, 74-75.
- Selected chapters from: Levine, R. (1997). *A Geography of time*. Basic Books: NY.
  - Living on Event Time
  - Time and Power: The Rules of the Waiting Game
- Selected chapter from Rifkin, J. (1987). *Time wars: The primary conflict in human history*. Simon & Schuster: NY, NY.
  - Chapter 3 – Anthropological Time Zones.

## IX. Neural Bases of Temporal Behavior

- Interval timing vs. circadian timing
- Neural correlates of the Internal Clock/Attentional Gate Model
  - Basal Ganglia - timing and force of movements
  - Substantia Nigra - dopamine receptors and the pacemaker; Parkinson's disease
  - Cerebellum - movement timing, accuracy, and coordination; temporal production and perception

4. Frontal Cortex - planning, attentional resources, temporal ordering, prospective judgments
5. Hippocampus - retrospective duration judgments, anterograde amnesia, Korsakoff's syndrome

**Class Presentation: Temporal behavior of animals.**

**Readings:**

- Wittman, M. (1999). Time perception and temporal processing levels of the brain. *Chronobiology International*, 16, 17-32.
- Block, R. (1996). Psychological time and memory systems of the brain. In J.T. Fraser & M.P. Soulsby (Eds.), *Dimensions of time and life: The study of time VIII*. International Universities Press, Inc.: Madison, CT.
- Wright, K. (2006). Times of our lives. *Scientific American*, 16, 26-33.
- Sacks, O. (1990). The lost mariner. From *The Man Who Mistook His Wife for a Hat and Other Clinical Tales*.
- Sacks, O. (2004). Speed: Aberrations of time and movement. *The New Yorker*, August 23, 2004.

## **Course Requirements**

### **I. Class Presentation**

Each of you will assemble in small groups and be required to give an in-class presentation on a topic designed to provide greater breadth to an area discussed in class. You should plan on speaking for 30 min. and rely on a Powerpoint presentation (which I will then post on Moodle so that it is available to everyone). Each person in the group is expected to speak and so you should allocate the half hour in an equitable fashion. I've provided a set of presentation topics on the syllabus and will try to ensure that everyone receives a topic that is acceptable to them.

### **II. Paper**

In addition to the presentation, you will also be required to write a paper for the course. You are free to choose any topic that interests you as long as it involves some aspect of temporal behavior. It could be a topic that was never discussed, or a topic that was addressed in class but explored from a different perspective. In either case, the paper should be around 10-15 pages and rely on the APA style of referencing. Most of the paper should serve as a review of the relevant literature but the last 2-3 pages should provide your own thoughts and evaluation (e.g. critiques of the literature; ideas for future research). Your paper will be due on **Thursday, April 2**

**Psy 220 – Psychology of Time**  
**Schedule of Lectures and Presentations**  
**Spring, 2015**

- Jan. 20 – Overview and History of Time-keeping  
22 - Rhythm  
27 - Rhythm  
29 – Rhythm
- Feb. 3 – Rhythm - **Presentation on Circadian Disturbances in Mental Illness**  
5 – Time and Language  
10 – Time and Language  
12 – Time and Language – **Presentation on Temporal Metaphors**  
17 - Tempo  
19 - Tempo  
24 – Tempo – **Presentation on Tempo and Technology**  
26 - Duration
- March 3 - Duration  
5 – Duration – **Presentation on Timing in Sports**  
10 – Spring Break  
12 - Spring Break  
17 – **EXAM ONE**  
19 – Temporal Perspective  
24 – Temporal Perspective  
26 – Temporal Perspective - **Presentation on Psychological Distance and Temporal Construal**  
31 – Time and Autobiographical Memory
- April 2 – Time and Autobiographical Memory – **PAPER DUE**  
7 – **Presentation on Development of Time**  
9 – Social Time  
14 – Social Time  
16 – Social Time – **Presentation on Time and Art**  
21 – Neural Mechanisms  
23 – Neural Mechanisms  
28 – Neural Mechanisms – **Presentation on Animal Time**  
30 – **EXAM TWO**

**Presentation Topics**

**Circadian Disturbances**

**Temporal Metaphors**

**Tempo and Technology**

**Time and Sports**

**Temporal Construal**

**Development of Time**

**Time in Art**

**Animal Time**