



College of Applied Sciences and Arts
Department of Kinesiology
Kin 266, Section 1
Spring 2013; Mondays, 1600-1845
SPX 077


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Principles and Concepts of Advanced Motor Learning

D2L and MYSJSU Messaging

Course materials such as the course syllabus and major assignment handouts can be found on Desire to Learn (D2L) the content management system we use at SJSU. From the SJSU home page you can easily find the D2L entry page. From your D2L home page change the settings in preferences so that your e-mail is forwarded from D2L to your regularly used e-mail account. Also, you are responsible for regularly checking with the messaging system through MySJSU (or other communication system as indicated by the instructor).

Required Textbooks and Readings

 American Psychological Association. (2010). *Publication manual of the American Psychological Association* (6th ed). Washington, DC: Author.
*When buying the APA manual make sure it is *not* the first printing.

 Readings from the body of knowledge or subdiscipline of motor behavior are assigned on the *Course Calendar and Readings* handout (see D2L, under course information). Readings are available full text from the Martin Luther King Jr. Library at San José State University and should whenever possible be downloaded in PDF format.

Course Description

Motor behavior and the learning patterns developed in acquiring skill in a motor activity

Kinesiology Program Learning Objectives

- Conduct and critique research using theoretical and applied knowledge
- Interpret and apply research findings to a variety of disciplines within kinesiology
- Effectively communicate essential theories, scientific applications, and ethical considerations in kinesiology
- Acquire skills to become agents of change to address issues in kinesiology through the application of knowledge and research

Course Objectives

- s. Specifically, students will meet the following objectives by the end of the semester:
1. develop in depth knowledge of motor learning and control through discussion of selected current theoretical and empirical scholarship.
 - To meet this student learning objective essays on the midterm and final will specifically address understanding of current theoretical and empirical knowledge of motor learning and control; further the assignment of a scholarly review of literature will require that students pick relevant topics and explore the literature contributing to them.
 2. develop articulate thoughts and engage in critical thinking about motor learning and control problems through written and verbal assignments.
 - To meet this student learning objective the writing of abstracts of required weekly readings and the specific course activities such as reading discussion groups will measure how articulate and engaged students are with the material.
 3. develop questions and problems in motor learning and control research.
 - To meet this student learning objective a narrowly focused scholarly review of literature will be developed that could serve as a review for a specific research question or problem.
 4. develop a base of knowledge from which to draw applications for the work place involving the teaching, designing, preventing, and rehabilitating of motor skills.
 - To meet this student learning objective specific active learning environments will be used to make applications of the knowledge to the workplace. Also combining the ideas of human factors and ergonomics with kinesiology adds to the applications made in team presentations.

Topics

- I. Motor Behavior, a subdisciplinary approach
 - a. Definitions of motor behavior, motor learning, and motor control
 - b. Relationship of motor learning and control to motor behavior
 - c. Trends in motor learning and control for practitioners and clinicians
 - d. Experimental procedures in motor learning and control an the scientific process
 - e. Alternative experimental paradigms using in motor learning and control research
- II. Motor Skill Performance, Learning, and Memory
 - a. Skill taxonomies
 - b. Stages of learning
 - c. Information processing
- III. Nature of Expertise
 - a. Development of expertise
 - b. Expert and novice performance differences
 - c. Dynamic analyses of expertise
- IV. Practice Scheduling and Contextual Interference Theory
 - a. Theoretical ideas on practice scheduling and contextual interference in motor behavior
 - b. Explanations of context effects
 - c. Empirical support for contextual interference theory
- V. Information Feedback
 - a. Knowledge of results

- b. Understanding paradigms used to study KR
- VI. Dynamic Systems Approaches
 - a. Bernstein's perspectives
 - b. Thelen's perspectives
 - c. Complex systems
- VII. Implicit and Explicit knowledge structures

Expectations and Outcomes

Readings are assigned weekly for this course. The course calendar provides the bibliographic references you need to obtain the readings for each class. All readings can be obtained from full text databases made available through the [Martin Luther King Junior Library](#) at San José State University. A PIN is required for remote access to the library. A PIN can be established on-line or at the circulation desk of the King Library. In most cases the required readings can be accessed through the University databases, e.g.: *Academic Search Premier*, *Sport Discus*, and *PsycARTICLES*. Once you link to an article, chose download and if available print the paper in its PDF version. A PDF is an exact replica of the manuscript as it appears printed in a journal. The PDF provides the best vantage point for conducting and viewing scholarly work. When a PDF is not available and you download an HTML version be aware when referring to page numbers from the original article as these do not reflect the page numbers in the published version. Thus page numbers on the HTML version should not be referred to in this way. Reading assignments and due dates are provided on the course schedule. You are expected to come to class each week prepared to discuss topics in a seminar atmosphere and engage in critical thinking activities. **Absences for midterm and final exams will be accepted only for serious and compelling reasons. No papers will be accepted late.**

| <u>Evaluation Tools</u> | <u>Points Assigned</u> | <u>Points Earned</u> |
|---|------------------------|----------------------|
| Midterm exam | 15 | |
| Final exam | 20 | |
| Abstracts of Readings (submission as print copy); two abstracts written and presented according to format presented in class and APA guidelines | 10 | |
| Scholarly review of literature on a topic in motor learning (submission on D2L only) <ul style="list-style-type: none"> • Topic Submission (with 5 scholarly sources) (5) • 2 Page Summary (with more than 5 scholarly sources; must conform to APA format and include appropriate citations to produce a scholarly paper) (10) • Scholarly Review of Literature (no more than 10 pages of text; no less than 15 source materials; must conform to APA and include appropriate citations to produce a scholarly paper) (25) • Oral presentation of review of literature (PowerPoint presentation or other required) (5) | 45 | |
| Team project and overall participation in course; includes participation in on-line discussions and team activities. Rubric for assignment of grade is presented here. | 10 | |

| Grade Calculator | |
|------------------|----------------|
| Points Earned | Grade Assigned |
| 98-100 | A+ |
| 93-97.99 | A |
| 90-92.99 | A- |
| 88-89.99 | B+ |
| 85-87.99 | B |
| 80-84.99 | B- |
| 78-79.99 | C+ |
| 75-77.99 | C |
| 70-74.99 | C- |
| 68-69.99 | D+ |
| 65-67.99 | D |
| 60-64.99 | D- |
| ↓ 59.99 | F |

Exams

The midterm exam is scheduled for **Monday, March 11, 2013** and will be available on D2L from 4pm until 12pm. The final exam is scheduled in class on **Monday, May 20, 2013** as determined by the university catalog. Exams are composed of essay questions. The final exam is cumulative and includes all work discussed in class and in the assigned readings. Students are expected to develop clear, logical, scholarly, and applied descriptions of their newly acquired knowledge.

Abstracts

Students are required submit two abstracts using APA conventions. The abstracts should represent original written work and be developed to summarize one or more of the readings for a particular class. Abstracts should be submitted in print form and should be no more than 250 words. They should be written according to APA conventions (see page 27 and page 41 of the *APA Manual*).

Final Paper, Scholarly Review of Literature

The final paper should reflect a well-focused scholarly review of the literature (see Writing Reviews of Literature guidelines posted) on a current topic in motor learning and control. For this review of literature assignment, select a narrowly focused topic and develop a well written and integrated, extensively researched review paper. To assist with the process of writing the paper the development will be evaluated at three intervals: the topical idea (Due: Feb 25); a summary of the information (Due: April 8); the final scholarly review of literature. The style of the paper should conform to the conventions of the [Publication Manual of American Psychological Association](#) (6th edition). Late papers are unacceptable; only serious and compelling reasons for tardiness will be accepted. The final paper is due on **Monday, May 13, 2013**. In addition to writing the scholarly review of literature each student will be expected to present their review to the class. Oral Presentations of the review of literature will take place on consecutive **Monday, May 13, 2013**.

All submissions must be double spaced and formatted according to APA conventions (Version 6). Submit all printed papers through D2L. The file submission should be labeled as *Firstname Lastname Review of Literature*.

Team Project

Students will be assigned to work teams for the purpose of conducting a team project. Each team will be assigned a topic in motor learning for deeper understanding and critical analysis of an issue in motor behavior. The tasks underlying the assignment include: investigation of a major theory associated with motor learning and control research, discovery of current empirical research paradigms used for testing hypotheses in the specific area selected, and application of the information obtained in our various fields. Excellent papers should help uncover questions for future research, and the need for continuing or possibly discontinuing this line of research. All groups will present their analyses to the class on **Monday, May 6, 2013**.

Team Project Grading Rubric

| | |
|------|--|
| 9-10 | Often acted as team leader; considered a major player in developing ideas; made significant and meaningful contributions to the team project and the class |
| 7-8 | Participated in all aspects of the development and presentation of the team project; followed the will of the group and the class |
| 5-6 | Participated in the project development and presentation as necessary; was often not available for teamwork ; presented a part of the project but was not really integrated into the whole |
| <5 | Meager participation in the team project and the class |

SJSU Statement of Academic Integrity

Academic integrity is essential to the mission of San José State University. As such, students are expected to perform their own work (except when collaboration is expressly permitted by the course instructor) without the use of any outside resources. Students are not permitted to use old tests, quizzes when preparing for exams, nor may they consult with students who have already taken the exam. When practiced, academic integrity ensures that all students are fairly graded. Violations to the Academic Integrity Policy undermine the educational process and will not be tolerated. It also demonstrates a lack of respect for oneself, fellow students and the course instructor and can ruin the university's reputation and the value of the degrees it offers.

We all share the obligation to maintain an environment which practices academic integrity. Violators of the Academic Integrity Policy will be subject to failing this course and being reported to the Office of Judicial Affairs for disciplinary action which could result in suspension or expulsion from San José State University. For more in depth understanding of Academic Integrity see http://sa.sjsu.edu/judicial_affairs/faculty_and_staff/academic_integrity/ten_principles_for_academic_integrity.html.

SJSU Statement on Students with Disabilities

If you need course adaptations or accommodations because of a disability, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities register with DRC to establish a record of their disability.

Classroom Protocol

Classroom protocol requires that students are courteous during class. Any student engaging in disruptive behavior will be asked to leave. This includes arriving more than 10 minutes late to class. Please turn off all cell phones, pagers, PDA's or other electronic device. The use of anything that beeps or vibrates during class is disruptive and will not be tolerated. If you are caught using a telephone (even silently, e.g. texting), you will be asked to leave the classroom.

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester's [Catalog Policies](http://info.sjsu.edu/static/catalog/policies.html) section at <http://info.sjsu.edu/static/catalog/policies.html>. Add/drop deadlines can be found on the [current academic calendar](http://www.sjsu.edu/academic_programs/calendars/academic_calendar/) web page located at http://www.sjsu.edu/academic_programs/calendars/academic_calendar/. The [Late Drop Policy](http://www.sjsu.edu/aars/policies/latedrops/policy/) is available at <http://www.sjsu.edu/aars/policies/latedrops/policy/>. Students should be aware of the current deadlines and penalties for dropping classes. Information about the latest changes and news is available at the [Advising Hub](http://www.sjsu.edu/advising/) at <http://www.sjsu.edu/advising/>.

University Resources

Computer labs for student use are available in the Academic Success Center located on the 1st floor of Clark Hall and on the 2nd floor of the Student Union. Additional computer labs may be available in your department/college. Computers are also available in the Martin Luther King Library. A wide variety of audio-visual equipment is available for student checkout from Media Services located in IRC 112. These items include digital and VHS camcorders, VHS and Beta video players, 16 mm, slide, overhead, DVD, CD, and audiotape players, sound systems, wireless microphones, projection screens and monitors.

Learning Assistance Resource Center (LARC)

The Learning Assistance Resource Center (LARC) is located in Room 600 in the Student Services Center. It is designed to assist students in the development of their full academic potential and to inspire them to become independent learners. The Center's tutors are trained and nationally certified by the College Reading and Learning Association (CRLA). They provide content-based tutoring in many lower division courses (some upper division) as well as writing and study skills assistance. Small group, individual, and drop-in tutoring are available. Please visit [the LARC website](http://www.sjsu.edu/larc/) for more information at <http://www.sjsu.edu/larc/>.

SJSU Writing Center

The SJSU Writing Center is located in Room 126 in Clark Hall. It is staffed by professional instructors and upper-division or graduate-level writing specialists from each of the seven SJSU colleges. Our writing specialists have met a rigorous GPA requirement, and they are well trained to assist all students at all levels within all disciplines to become better writers. The [Writing Center website](http://www.sjsu.edu/writingcenter/about/staff/) is located at <http://www.sjsu.edu/writingcenter/about/staff/>.

Our LIBRARY LIASON is Peggy Cabrera. She can be reached at: peggy.cabrera@sjsu.edu.

Peer Mentor Center

The Peer Mentor Center is located on the 1st floor of Clark Hall in the Academic Success Center. The Peer Mentor Center is staffed with Peer Mentors who excel in helping students manage university life, tackling problems that range from academic challenges to interpersonal struggles. On the road to graduation, Peer Mentors are navigators, offering “roadside assistance” to peers who feel a bit lost or simply need help mapping out the locations of campus resources. Peer Mentor services are free and available on a drop –in basis, no reservation required. The [Peer Mentor Center website](http://www.sjsu.edu/muse/peermentor/) is located at <http://www.sjsu.edu/muse/peermentor/>

**Graduate Motor Learning
Course Calendar Spring 2013**

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|-------------|---|
| January 28 | Introduction to motor learning and course introductions |
| February 4 | Overview of motor learning and information processing approaches |
| February 11 | What about research? Possible on-line class due to Jury Duty; please check appropriate e-mail and D2L postings for further information |
| February 18 | Task classification systems |
| February 25 | The nature of expertise Topic Due |
| March 4 | Schema theory |
| March 11 | Midterm Exam |
| March 18 | Schema theory and practice scheduling |
| March 25 | No class; spring break |
| April 1 | No class; Cesar Chavez Day |
| April 8 | Contextual interference theory 2 Page Summary Due |
| April 15 | Contextual interference theory and empirical research |
| April 22 | Bernstein and dynamic systems perspectives (on-line class; AAHPERD National Convention) |
| April 29 | Implicit and explicit processing |
| May 6 | Presentation of team projects |
| May 13 | Presentation of individual reviews Scholarly Review of Literature Due |
| May 20 | Final exam will be available on D2L from 1600-2359 on this evening |

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***Principles and Concepts of Motor Learning
Spring 2013 Calendar and Assigned Weekly Readings***

Assigned weekly readings are to be completed by the listed dates. With minimal flexibility we will adhere to the schedule provided. After reading the weekly assignment you should be prepared to contribute to class discussions. Consider the following questions and activities while you read to critically analyze and think about motor learning: what kind of research does this article represent; how does the research support theory; in what ways can this area of research be expanded; what are some research questions emerging from these empirical studies; how does the research described fit with the movement focus from kinesiology and human factors/ergonomics approaches?

Each student is responsible for submitting a total of two original abstracts of the weekly readings. The abstract can summarize either one study or multiple studies from the assignments. Abstracts should contain original written material and they should conform to the conventions of the [*American Psychological Association Publication Manual, 6th Ed.*](#)

January 28, 2013 - Introduction to motor learning and control; course introductions

February 4, 2013 - Overview of motor learning and information processing approaches

Park, R. J. (1994). A long and productive career: Franklin M. Henry - Scientist, mentor, pioneer. *Research Quarterly for Exercise and Sport, 65*, 295-307.

Fischman, M.G., Christina, R.W., & Anson, G. (2008). Memory Drum Theory's C movement: Revelations from Franklin Henry. *Research Quarterly for Exercise and Sport, 79*, 312-318.

February 11, 2013 -What about research?

Vicente, K. J. (1997). Heeding the legacy of Meister, Bunswik, & Gibson: Toward a broader view of human factors research. *Human Factors, 39*, 323-328.

Payne, D. G., & Blackwell, J. M. (1997). Toward a valid view of human factors research: Response to Vicente (1997). *Human Factors, 39*, 329-331.

Jones, K.S., Derby, P.L, & Schmidlin, E.A. (2010). An investigation of the prevalence of replication research in human factors. *Human Factors, 52*, 586-595.

February 18, 2013 -Task classification systems

Gentile, A. M. (2000). Skill acquisition: Action, movement, and neuromotor processes. In J. H. Carr, R. B. Shepherd, J. Gordon, A. M. Gentile, & J. M Held (Eds.), *Movement science: Foundations for physical therapy in rehabilitation, 2nd Ed.*, (pp. 111-187). MD: Aspen.

February 25, 2013 -The nature of expertise

Ericsson, K.A., & Ward, P. (2007). Capturing the naturally occurring superior performance of experts in the laboratory. *Current Directions in Psychological Science, 16*, 346-350.

Farrow, D. (2010). A multi-factorial examination of the development of skill expertise in high performance netball. *Talent Development & Excellence, 2* (2), 123-135.

Runigo, C.L., Benguigui, N., Bardy, B.G. (2010). Visuo-motor delay, information-movement coupling, and expertise in ball sports. *Journal of Sport Sciences, 28* (3), 327-337.

March 4, 2013 - Schema Theory

Schmidt, R.A. (1975). A schema theory of discrete motor skill learning. *Psychological Review, 82*, 225-260.

March 11, 2013 - MIDTERM EXAM on D2L which must be completed by midnight tonight.

March 18, 2013 – Schema Theory and practice scheduling

Schmidt, R.A. (2003). Motor schema theory after 27 years: Reflections and implications for a new theory. *Research Quarterly for Exercise and Sport, 74*, 366-375.

Optional

Sherwood, D.E., & Lee, T.D. (2003). Schema theory: Critical review and implications for the role of cognition in a new theory of motor learning. *Research Quarterly for Exercise and Sport, 74*, 376- 382.

Newell, K.M. (2003). Schema theory (1975): Retrospectives and prospectives. *Research Quarterly for Exercise and Sport, 74*, 383-388.

March 25, 2013 – No class; spring break

April 1, 2013 – No class Cesar Chavez Day

April 8 – Contextual Interference Theory

Battig, W. F. The flexibility of human memory. In F.I.M. Craik

Gudagnoli, M.A., & Lee, T.D. (2004). Challenge point: A framework for conceptualizing the effects of various practice conditions in motor learning. *Journal of Motor Behavior, 36*, 212-224.

April 15, 2013 – Contextual Interference Theory and Empirical Research

- Goettl, B. P. (1996). The spacing effect in aircraft recognition. *Human Factors*, 38, 34-49.
- Russell, D.M., & Newell, K.M. (2007). How persistent and general is the contextual interference effect? *Research Quarterly for Exercise and Sport*, 78, 318-327.
- Hodges, N.J., Edwards, C., Luttin, S., & Bowcock, A. (2011). Learning from experts: gaining insights into best practice during the acquisition of three novel motor skills. *Research Quarterly for Exercise and Sport*, 82(2), 178-.

April 22, 2013 - Bernstein and dynamic systems perspectives

- Gentile, A. M. (2000). Skill acquisition: Action, movement, and neuromotor processes. In J. H. Carr, R. B. Shepherd, J. Gordon, A. M. Gentile, & J. M Held (Eds.), *Movement science: Foundations for physical therapy in rehabilitation*, 2nd Ed., (pp. 111-187). MD: Aspen.
- Bongaardt, R., & Meijer, O.G. (2000). Bernstein's theory of movement behavior: Historical development and contemporary relevance. *Journal of Motor Behavior*, 32, 57-71.
- Karwowski, W. (2013). A review of human factors challenges of complex adaptive systems: discovering and understanding chaos in human performance. *Human Factors*, 54, 983-995.

Optional

- Jax, S.A., & Rosenbaum, D.A. (2003). Computational motor control and human factors: Modeling movements in real and possible environments. *Human Factors*, 45, 5-27.

April 29, 2013 – Implicit and Explicit Processing

- Magill, R.A. (1998). 1997 C.H. McCloy research lecture: knowledge is more than we can talk about: implicit learning in motor skill acquisition. *Research Quarterly for Exercise & Sport*, 69 (2), 104-110.
- Masters, R.S.W., Poolton, J.M., Maxwell, J.P., & Raab, M. (2008). Implicit motor learning and complex decision making in time-constrained environments. *Journal of Motor Behavior*, 40 (1), 71-79.

May 6, 2013 -Presentation of Team Projects

May 13, 2013 -Presentations of individual student projects

May 20, 2013 – Final Exam