

CENTER FOR COGNITIVE SCIENCES
MEMBERSHIP HANDBOOK

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SECTION I
CENTER ACTIVITIES

The Center for Cognitive Sciences (CCS) is an interdisciplinary, interdepartmental research center established to promote and support scholarship, research, and training in learning, perception, cognition, and other related areas. Affiliate with the Center is based on demonstrated research interests, activity and expertise. Faculty and student members come from various colleges and schools within the University; their specialty fields include: child development, cognitive science, computer science, electrical and mechanical engineering, communication disorders, instructional design, kinesiology, linguistics, management and decision sciences, neuroscience, physical education, psychological foundations of education, psychology, physiology, and radiology.

The close intellectual contact with other scholars who share an interest in learning, perception, and cognition influences and stimulates each participant in the Center in significant and productive ways. The encouragement of research, especially through the exchange of ideas and paradigms, is the essence of the Center's program. A vital program can only be maintained when all members actively participate.

Almost from its inception, the Center for Cognitive Sciences has provided a formal training component for predoctoral students, and many of its other academic activities also focus on students. Center graduate students belong to several research groups that frequently connect the perspectives of one investigator with those of another. Debates are sharpened and new issues emerge with experimental questions.

Public Participation

Many of the Center's colloquium speakers are from local universities and corporations. The Center organizes other special outreach programs such as the 25th Anniversary Celebration and an Affiliated Scientists Reception where industry professionals were specifically honored and invited to meet with students. The Center organized the 1997 Minnesota Conference on Vision for Reach and Grasp where 26 speakers from 8 countries presented their research. A sesquicentennial conference, Mind and Emotion: From the Molecular to the Cultural was held in the spring of 2001. This conference featured 21 speakers from around the nation as well as professors from the University of Minnesota.

Attendance at the Center's public functions, such as the colloquium series during the academic year, is open to all with an interest in learning, perception, and cognition. The Center is happy to circulate its electronic calendar to all interested persons.

Research Orientation and Training Retreats

Every fall semester new and returning students and faculty participate in a Research Orientation and Training Retreat, an intensive instructional gathering where faculty members present and discuss current research in its full diversity.

A similar retreat occurs each spring in which all trainees present papers or posters based on their significant research activities. The spring retreat is the student counterpart of the fall Research Orientation and Training Retreat. At this retreat, students are the program presenters. The occasion allows the students to make a formal presentation of their research in a situation similar to what they will experience when presenting at a convention or other scientific meetings.

Training Committee

A Training Committee composed of faculty, students, and staff designs a set of training sessions during the academic year. The Training Committee also helps to establish a procedure for evaluating student progress at the end of the year. The training meeting topics usually focus on professional activities and ethics of research. These have included sessions on: grant writing, manuscript preparation, design of introductory and advanced courses, styles of teaching, effective oral presentations, job opportunities in applied settings, use of computers in research designs, rights of students, preparing a vita, postdoctoral fellowship opportunities, establishing a lab, and other topics of professional concern.

Cognitive Science Minor Program

The University of Minnesota has an excellent environment for research in Cognitive Science. We have unusual strength in vision research (including perception, neuroscience, computational modeling and applications) and there is a strong auditory group as well. The University has a flourishing Neuroscience Graduate Program that has been successful in recruiting top graduate students nationally, with more than seventy participating faculty. New strengths in clinical departments, including Neurology, Neurosurgery, and Psychiatry have brought a strong basic science emphasis to these areas and to related clinical programs.

An interdisciplinary minor in Cognitive Science was established by the Graduate School in 1989. The impetus for this minor program was recognition of the need for a formal organizational structure to facilitate graduate academic activities in this rapidly advancing domain of inquiry. The minor is available to both the Masters and Doctoral levels of graduate work. It provides a set of integrated courses that emphasize theory and methods in Cognitive Science. A major goal of the program is to increase and enhance the interactions among graduate students and faculty involved in Cognitive Sciences.

The Center is a major supporting unit for the Cognitive Science Program. The Director of Graduate Studies for Cognitive Science is Charles R. Fletcher. A bi-weekly proseminar in Cognitive Science is required of students in the minor program and open to the University community. It consists of a series of lectures, lab tours, and interactive demonstrations by Cognitive Science Faculty and occasional visiting professors.

Weekly Colloquium Series

In the Center, Trainees and Associates from various backgrounds plan for and participate in the Cognitive Science Colloquium Series, selecting speakers and hosting outside visitors for presentations.

Selected students become steeped in outside visitors' areas of specialization and, during special training meetings, help orient other students and faculty concerning the upcoming research presentation. In addition, regularly scheduled research groups involve faculty and students in informal exchange, discussion, and argumentation on topics that are often related to the colloquium presentations.

A colloquium is presented each week by a Center postdoctoral student, visiting faculty of another institution, faculty member of the University, or by an expert whose work is of special interest to the Center. These presentations may include the beginnings of a research program, data from a specific project, or the report of a student's doctoral research. The occasion is also used to allow advanced students to present their research in a situation similar to what they may experience when interviewing for a faculty position.

The 'internal colloquium' committee is run by students with faculty guidance. The committee solicits speakers and arranges the schedule. The composition of the committee assures an interdisciplinary sampling of speakers. This series also expands the boundaries of the Center, because speakers are selected from any corner of the campus or from neighboring campuses. It is not unusual to have a behavioral scientist from another department request the opportunity to present data at one of these weekly colloquia. It is an excellent opportunity to share ideas with a friendly but critical audience.

Approximately thrice each semester, a distinguished cognitive scientist is invited to campus for two days of intensive interaction with faculty and students. The 'external committee' obtains recommendations from the various research groups within the Center for 'external' speakers who would be especially valuable in guiding their research, and who will also appeal to the Center as a whole. Before the visitor arrives on campus, a set of representative reprints will have been made available in the Center and one of the students will have summarized the visitor's research and experimental approach during a training meeting.

The visitor will usually appear at an informal discussion hour before giving a formal presentation. The formal presentation is open to the entire community. Students escort and have lunch or dinner with the visitor. The visitor also tours relevant laboratories and is asked to consult with the special research groups working in related areas. These visitors present their own research, comment on research being done in the Center, and provide guidance concerning the students' ongoing research programs. Students and faculty also have the opportunity to meet individually with visitors. The 'external'

colloquia offer the occasions for intense and concentrated intellectual activity, both in anticipation of the visit and while the consultant is on campus. It is a time of heightened interdisciplinary exchange and preparation, and an excellent example of a way to motivate scholarly activity without inducements of courses or examinations. The presentations and informal activities provide an important aspect for faculty and students to coalesce and to be stimulated in areas that may be outside of their ordinary sphere of research.

Since 1998, in addition to the regular Cognitive Science Colloquium Series once a month the Cognitive Neuroscience Colloquium Series has brought in internationally known speakers in cognitive science and brain imaging whose work is relevant to human learning and its practical applications. As an example, David Heeger of Stanford described recent work on brain imaging and dyslexia, and Paula Tallal of Rutgers provided an example of bridging research and remediation for language learning impairments (<http://vision.psych.umn.edu/www/cogneurosci/>).

Student Research Support

There are many other activities sponsored by the Center that promote the development of skills in research and theory. Student associates and trainees receive an **annual allotment** that can be used to fund studies for subject payments, purchase lab stimulus/supplies, or travel to present their research at national professional meetings. This opportunity is a significant incentive for our students and insures that they develop professionally as well as scientifically. The students also have access to the Center's shops and other facilities where they can learn about design of equipment and ways of representing data. They serve on committees and learn about the sources of funding for the Center and the mechanisms of governance that support a major collaborative research enterprise. These are not formal academic experiences per se, but they are valuable in preparing students for research careers.

Academic Evaluations

Student progress is monitored both by their home department and the Center. The structure of the Center encourages many faculty members to interact with individual students and to note their growth in understanding research, as well as acquiring the skills for conducting research. Students have numerous opportunities to present their work through the research groups, spring retreat and internal colloquia, all of which are attended by Center faculty. In addition, the training committee sets up a formal evaluation procedure for all Center students each year. The evaluation includes a report by the students of research presentations, completed and published papers, laboratory experiences, current research activity, and complete course work. IN addition, each student is typically interviewed by a faculty member of the Training Committee. These evaluation procedures provide the faculty with detailed information concerning the student's activities and progress. The Training Committee reports to the Governing

Council the information obtained for each student and uses this to make suggestions to the student and advisor concerning the student's progress and activities. On occasion, the evaluations have made clear that a student's interests or level of performance were not consistent with those of the Center and the student's traineeship has been withdrawn. The evaluation also gives students an opportunity to express their views of their experiences in the Center, leading to new programs and other improvements in the administration of the Center.

Summer Research Activities

The Center also administers the Research Experience for Undergraduates, a 10-week intensive summer program that emphasizes student participation in research activities of faculty affiliated with the Center and working in the disciplines of behavioral sciences. Students attend weekly research and lab meetings, develop a project with the assistance of their mentor, present their papers and publish the proceedings at the end of the program. This program is funded by the National Science Foundation, the National Institute of Mental Health, several University collegiate/departmental units, and also includes funding to recruit students of under-represented groups.