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Institutional Representation of Student Presentations at Psychology Research Conferences: Trends and Implications

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**Institutional Representation of Student Presentations at Psychology Research
Conferences: Trends and Implications**

BY

Cathy D. Schoonover

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF

Master of Arts in Clinical Psychology

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY
CHARLESTON, ILLINOIS

2002

I HEREBY RECOMMEND THAT THIS THESIS BE ACCEPTED AS FULFILLING
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Abstract

Student participation in psychology undergraduate research conferences has pedagogical benefits encompassing experiential and collaborative learning, and enhancement of critical thinking skills. This project was designed to determine whether more conference participants originate from baccalaureate colleges than from research universities and what topics they present. Archival data were gathered from five geographically diverse undergraduate conferences and information extracted to determine institutions of origin. Institutions were categorized according to the Carnegie Classification of Institutions of Higher Education, then compared using chi-square tests. Information concerning topics presented were categorized according to six content domains of psychology and also analyzed with chi-square tests. The findings indicate that undergraduate research conferences draw more participants from bachelors and masters institutions than from doctoral institutions, and that social/emotional research topics are significantly overrepresented.

Dedication

To **Dr. Jane Siddens Nickens**, mother of my heart, who has taught me more psychology than textbooks ever could. You have walked patiently with me over hill and vale, always letting me run and always being there when I run back. Through your wisdom, wit, perseverance, and love you have instilled in me the strength and courage necessary for me to become the woman I have become. With undying gratitude and affection, I return to you one of the multiple fruits of your labor, this thesis.

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Institutional Representation of Student Presentations at Psychology Research Conferences: Trends and Implications

During the past two decades, emphasis on student research at the undergraduate level has increased dramatically (Gonzalez, 2001; Kardash, 2000). Once reserved for graduate students, the proposal-to-dissemination research experience is becoming more commonplace in undergraduate psychology departments, emanating from research methods classes, capstone courses, independent studies, and internships. Undergraduate research, however, often serves an entirely different purpose than does its graduate-level counterpart; its aim is pedagogical and student centered (Anderson & Rosenfeld, 1988; Hakim, 1995), with the experience itself the primary goal.

Such research experiences allow students to become “active, creative participant[s] in the scientific process” (Carsrud, 1988, p. 205) by exercising critical thinking and curiosity. Other expected outcomes include independent thinking, improved originality, initiative, resourcefulness, increased knowledge of methodology and theory, and enhanced problem solving and communication skills (Kardash, 2000). Because the majority of baccalaureate psychology majors will not continue toward graduate education in the field (Carsrud, Palladino, Tanke, Aubrecht, & Huber, 1984; Kyle & Williams, 2000), the justifications for undergraduate research must extend beyond graduate school preparation if it is to be of value to all psychology students. Indeed, we find undergraduate research encompassing larger, yet more subtle objectives within the scope of broader goals such as education in general, science as a whole, institutions of higher learning, and the overall psychology curriculum.

According to the National Research Council, “undergraduate education in science, mathematics, engineering, and technology is a critical determinant of our national future” (Newman, 1998, p. 1033). Faced with the challenge of this responsibility, educators in psychology contribute proficiency in methodology as well as human elements that the “hard” sciences often lack. Education is a human process that requires a human focus. Academic psychologists continue to provide this focus, offering an informational core for the foundations underlying all education, including expertise in the subfields of perception, learning, memory, intelligence, and creativity as well as in the social and organizational principles involved in integrating them.

Science education, however, does not necessarily need the injection of more scientific information in order to be more effective. As John Dewey long ago suggested, the better approach to learning may lie in creative and discovery-oriented avenues rather than in traditional lecture style education (Boyer, 1990; Boyer Commission, 1998; Newman, 1998). Project Kaleidoscope (PKAL) represents the work of one of several organizations dedicated to reforming science education. Toward the objective of “shaping a new educational philosophy,” two basic problems are cited as threats to undergraduate science: 1) “the tension between research and teaching at the undergraduate level,” and 2) “the scarcity of programs which enable students to take an active role in their learning, through structured opportunities for hands-on, collaborative, investigative learning” (Project Kaleidoscope, 2002, p. 1).

The notion that lecture-style teaching is not central to learning is prevalent in social constructivist theory (Lave & Wenger, 1999). Learning is a broader concept than teaching alone can accommodate, often happening implicitly, as a way of life.

Constructivist theorists and researchers (e.g., Driscoll, 1994; Herrington & Oliver, 2000; Lave & Wenger, 1999; Nyikos & Hashimoto, 1997; Vygotsky, 1980) have emphasized the importance of social interaction to the learning process, suggesting that collaboration and cognitive apprenticeships enhance cognition by placing learning in its context. They have purported that meaningful learning takes into account the dependent interrelationship between cognition and situation; thus, in order to be available in real-life situations, information must be stored as useful tools rather than as facts. This philosophy integrates the acts of knowing and doing into the single concept of situated learning, defined by Collins as “the notion of learning knowledge and skills in contexts that reflect the way the knowledge will be useful in real life” (Herrington & Oliver, 2000, p. 23). After all, knowledge is generally not meant to be the final product of education; subsequent application gives knowledge its real value.

College research experiences potentially place the student in this situated learning setting and in a position of legitimate peripheral participation, described by Lave and Wenger (1999) as an apprenticeship in a community of practice. As an apprentice, a student works with a master in a reciprocal, mentoring-type relationship in which solutions are co-constructed and decision making is shared (Driscoll, 1994). In this way, the student builds personal power through participation and engagement in practice, while cognitive development arises from the incorporation of new ideas and viewpoints into the student’s existing schema. As cited in Kardash (2000), Richmond claims that “all students are capable of developing skills associated with scientific understanding and problem solving, and that participation in a scientific community helps students to

develop a view of the culture and practice of science that enhances that understanding” (p. 199).

Critical thinking is both a required element in, and an outcome of, the situated learning setting. The student who does not practice critical thinking *learns* to practice it. Halpern (1996) suggests that when the design of instruction is purposefully set up to teach critical thinking, college students will learn to think more critically. She describes critical thinking as “purposeful, reasoned, and goal directed” (p. 5). Defined by Beyer (1985, p. 276) as “the process of determining the authenticity, accuracy, and worth of knowledge claims,” critical thinking requires “a frame of mind that allows examination of multiple viewpoints and a number of specific mental operations, such as determining the reliability of a source, distinguishing relevance, detecting bias, identifying assumptions, and recognizing inconsistencies or fallacies.” Lawson (1999) has extended this definition to encompass what he terms “psychological critical thinking” (p. 207), specifying that undergraduate students should be able to apply basic principles of psychology, readily pinpointing such weaknesses as a lack of empirical evidence, biased samples, anecdotal evidence, and correlational data when evaluating claims. The ability to apply skills to different contexts is an important aspect of this type of thinking, required daily in life outside academia (Halpern, 1996). Thus, critical thinking becomes a key tool in situated learning, lending the ability to apply knowledge to context. Enhancement of critical thinking skills, a mutual goal of education, science, and psychology, is an expected outcome of undergraduate research.

Herrington and Oliver (2000) extracted nine critical characteristics of situated learning from available literature. These elements can easily be applied to the ideal

undergraduate research experience, allowing that “knowledge” refers to knowledge of the research process rather than of the topic researched:

1. Provide authentic contexts that reflect the way the knowledge will be used in real life.
2. Provide authentic activities.
3. Provide access to expert performances and the modeling of processes.
4. Provide multiple roles and perspectives.
5. Support collaborative construction of knowledge.
6. Promote reflection to enable abstractions to be formed.
7. Promote articulation to enable tacit knowledge to be made explicit.
8. Provide coaching and scaffolding by the teacher at critical times.
9. Provide for authentic assessment of learning within the tasks. (p. 26)

Expert performances, modeling of processes, collaboration, and coaching are all provided by the instructor or mentor, serving as an advisor for the project. As the client-therapist relationship is critical to the success of therapy, the student-faculty relationship is critical to the authentic learning experience. To be effective the faculty mentor and the protégé must be well matched (Kring, Richardson, Burns, & Davis, 1999), and the relationship must be one of mutual trust and respect (Boyer Commission, 1998), focused on the student’s learning (Kardash, 2000). Ideally, the mentor-protégé collaboration takes place in frequent, regular meetings, during which the student has the opportunity to articulate reflections on his or her work. In addition, it may be helpful to include several research students in such meetings, even though they may be working on different

projects. With the input of other minds comes other perspectives and additional opportunities for collaboration and reflection.

Because dissemination of information is usually the goal of a research project, undergraduate research conferences serve as authentic contexts as well as authentic activities for students who participate in collaborative research, offering a process and climate comparable to professional conferences. This is not to say that the research experience will only be valuable to those students who plan to pursue a career involving further research; rather, that the learning experience follows the same course that any researcher, regardless of operational level, might pursue.

Assessment should to some degree be ongoing throughout all stages of the project, from selection of a topic and creation of a working bibliography to the writing and presentation of the research paper. Thus, with these nine elements of situated learning met, the undergraduate research experience becomes an authentic learning experience, complete with all its benefits. Even for those who do not choose to attend graduate school, participating in undergraduate research builds problem solving skills that are essential to most professional careers and helpful in many life circumstances (Boyer Commission, 1998; Carsrud, et al., 1984).

Ironically, throughout its history, undergraduate student research has been associated with teaching-centered baccalaureate institutions rather than with prestigious research universities, from which students may graduate without ever seeing, let alone benefiting from, the resident world-class professors and their associated work (Boyer Commission, 1998). According to the Carnegie Classification of Institutions of Higher Learning (Carnegie Foundation, 2000), Doctoral/Research Universities generally offer a

wide variety of baccalaureate programs and offer graduate degrees through the doctorate. They award a minimum of 10 doctoral degrees per year over at least three disciplines (Intensive) or a minimum of 50 doctoral degrees per year over 15 or more disciplines (Extensive). Research universities “consider research capability as a primary qualification for appointment, promotion, and tenure of faculty members” (Boyer Commission, 1998, p. 2), housing the world’s top scholars and a large percentage of Nobel laureates. A major consequence of this perspective is that many professors are conducting research rather than teaching, leaving the bulk of undergraduate instruction to graduate student teaching assistants. It is precisely this inattention to the undergraduate student that prompted the recommendations of the Boyer Commission (1998), culminating in a call for research institutions to “define in more creative ways what it means to be a research university committed to teaching undergraduates” (p. 38) by providing more than an ineffective imitation of the benefits that liberal arts colleges afford their undergraduates.

The Carnegie Classification (Carnegie Foundation, 2000) defines Liberal Arts Baccalaureate Colleges as primarily undergraduate institutions awarding at least half of their degrees in liberal arts fields (i.e., English, literature, foreign languages, biological/life sciences, mathematics, philosophy and religion, physical sciences, psychology, social sciences and history, visual and performing arts, area, ethnic, and cultural studies, general studies, and interdisciplinary studies). These institutions are generally known for having faculty that are committed to teaching as well as to scholarship. In this environment, “research typically engages undergraduates as research apprentices and often as collaborators,” and “one-on-one mentoring is commonplace”

(Myers & Waller, 1999, pp. 359-360). According to National Research Council data, liberal arts graduates earn math and science PhDs at more than twice the national average and natural science PhDs at two times the rate of baccalaureate graduates of research universities (Myers & Waller, 1999). Researchers surmise that the secret to this successful production of scientists may lie in the liberal arts environment, in which undergraduate mentoring and research opportunities create a genuine and lasting interest among students (Hakim, 1995; Myers & Waller, 1999; Newman, 1998; Kierniesky, 1984, Lopato, 2002; Schmauder, Robinson, & Hartley, 1999).

According to a report by the American Psychological Association's (APA) appointees to the Association of American Colleges' (AAC) 1988 study of 12 undergraduate majors, "a liberal arts education in general, and the study of psychology in particular, is a preparation for lifelong learning, thinking, and action; it emphasizes specialized and general knowledge and skills" (McGovern, Furumoto, Halpern, Kimble, & McKeachie, 1991, p. 600). The report states that just as institutions vary in their missions, the curricular goals of psychology departments vary among institutions. Researchers concur that common goals are, however, identifiable among different departments (e.g., Brewer, 1997; Halonen, et al., 2002; McGovern & Hawks, 1986; McGovern, et al., 1991; Messer, Griggs, & Jackson, 1999; Perlman & McCann, 1999). The Task Force on Undergraduate Psychology Major Competencies, appointed by the APA's Board of Educational Affairs, identified 10 suggested learning goals and outcomes for the psychology major: a) knowledge of the theory and content of psychology; b) knowledge of research methods in psychology, including the ability to "plan, conduct, and interpret results of research studies" (p. 11); c) critical thinking skills;

d) application of psychological principles; e) ethics and values; f) literacy in information technology; g) communication skills; h) sociocultural awareness; i) personal development; and j) career planning and development (Halonen, et al., 2002).

Similarly, in the AAC report (McGovern, et. al., 1991), eight specific goals of an undergraduate degree in psychology were recognized: (a) a knowledge base that involves a conceptual framework rather than isolated facts, (b) critical thinking skills involving inquiry and evaluation, (c) communication skills in both speaking and writing, (d) information gathering and integration skills, (e) research methods and statistical skills, (f) interpersonal awareness and sensitivity, (g) an understanding of the history of psychology, and (h) an understanding of ethical responsibility.

Participants in the APA-supported St. Mary's Conference of 1991 produced an instrumental publication, *Handbook for Enhancing Undergraduate Education in Psychology* (McGovern, 1993), stressing that goals such as the aforementioned should be included in curriculum planning. The St. Mary's report (McGovern, 1993) also suggests that an integrative senior capstone experience be included, in the form of supervised research projects, internships, or advanced courses.

In a follow-up study to the recommendations emanating from the St. Mary's Conference, Messer, et al. (1999) examined the curricula of 292 psychology programs, representative of each of the four major categories as identified by the Carnegie Classification guidelines (i.e., national universities, national liberal arts colleges, regional colleges and universities, and regional liberal arts colleges). Among their findings is that a relatively low percentage of degree options (16%) require a capstone research project, although their overall statistics indicate that 97% of programs require some type of

integrative experience. In a similar study, Perlman and McCann (1999b) found that 63% of departments required capstone courses, with only 5% of those mandating some type of research project. The majority of required capstone courses appear to be in history and systems (Perlman & McCann, 1999b; Messer et al., 1999). Another study by Perlman and McCann (1999a) shows that in 1997, research study was listed as an available course in only 28% of institutions, an increase from 24% in 1975.

Although there are discrepancies in the numbers presented, the picture comes into focus; undergraduate research is touted as extremely beneficial to science education; yet, outside of research methods courses, many psychology programs do not require, or even offer it. Such figures and the conclusions to which they lead seem to belie the professed growth of interest and participation in undergraduate research. This apparent contradiction may stem in part from a definitional issue, since in many schools, student research is not listed as a course, per se, but is included as independent study. In Perlman and McCann's study (1999), "independent study" is ranked much higher than "research participation" in a listing of the most frequently offered undergraduate psychology courses, showing a 13% increase (from 31% to 44%) in the 22-year period between 1975 and 1997. The data of Messer, et al. (1999) only take into account requirements for the major without considering voluntary research participation. Thus, little current information is available on what percentage of psychology majors are actually participating in independent/collaborative research experiences.

As previously mentioned, liberal arts colleges are providing a fair share of scientists, and it is speculated that a research-rich undergraduate experience is a major catalyst to this end. However, overall indications are, even taking into account the

independent study option, that less than one-half of all institutions make such an experience available to students. In searching for explanations, researchers have proposed several obstacles that may be blocking the widespread implementation of student research. One of these is the basic definition of faculty duties. Newman (1998) reports that only 15% of psychology departments consider research supervision to be part of the teaching load. It is time-consuming and often goes unrewarded, financially and collegiately (Bill, 1995; Friedenberg, 1995; Halpern, et al., 1998). In determining what is expected of faculty, the Society for the Teaching of Psychology's Task Force on Defining Scholarship in Psychology (Halpern, et al., 1998) explains the traditional as well as the extended faculty role. The authors state, "It is interesting to note that most of the general public believes that teaching is the primary task of faculty, yet...it tends to be denigrated and accorded the lowest status of any of the activities in which faculty engage" (Halpern, et al., 1998, p. 1296). Long considered to be equated with highly regarded original research in the field, scholarship is redefined by Halpern's task force to include the scholarship of teaching and its contribution of "stimulating intellectual curiosity in others" (Halpern, et al., 1998, p. 1296).

If instructors at research universities were given more time, compensation, and rewards for providing innovative and constructive learning opportunities, more undergraduate research would likely ensue (Boyer Commission, 1998). One way of doing this is to redefine faculty workloads and redistribute responsibilities according to individual talents for teaching, mentoring, or supervising student research. Such a shift would likely reduce occupational strain and enhance faculty development and morale, simultaneously strengthening the student experience by providing more faculty support

(Myers & Waller, 1999). Additionally, according to Freidenberg (1995) and Newman (1998), administrative support, at both the institutional and departmental level, is critical to the success of science programs, providing “the means, motive, and opportunity for undergraduate research” (Newman, 1998, p. 1041).

The same issues are echoed by PKAL (2002), with the suggestion that the two basic problems facing undergraduate science are (a) “the tension between research and teaching at the undergraduate level,” and (b) “the scarcity of programs that enable students to take an active role in their learning, through structured opportunities for hands-on, collaborative, investigative learning” (p. 1).

Another challenge facing undergraduate research in psychology is that students may not initially consider psychology to be a scientific field. Several researchers (e.g., Bahrnick, 1994; McGovern & Hawks, 1986; Newman, 1998) have noted that many undergraduate psychology majors choose the field because they are interested in its applied, service-oriented face. Though this may be due to a misconception of the breadth of psychology, it is a fortunate misconception in that educators are presented with the opportunity to cultivate scientific and research interests in these students. The drawback of such cultivation is that it takes time, and with laboratory interests generally not developing until at least the junior year (Newman, 1998), there is not much time left to nurture a budding curiosity. Both Newman (1998) and Bahrnick (1994) blame the lack of knowledge about the content of psychology on limited exposure in high schools, with Bahrnick (1994) suggesting “appropriate recruiting strategies” (p.93) beginning at the high school level to improve the fit between student interests and curricular content.

Additionally, obtaining funding for research can be a problem for both departments and individuals. In addition to departmental funding, some institutions and organizations (National Science Foundation, APA, Psi Chi, etc.) as well as corporate foundations provide student grant programs to encourage research participation (Palladino, et al., 1982). This practice takes the experience a step further into authenticity as the student deals with learning the procedures involved with grant application, a potentially rewarding experience educationally as well as financially. The deterrent, of course, is that the supervision of this process requires additional faculty time and effort.

In recapping the expected outcomes of undergraduate research projects, independent thinking, critical thinking, intellectual development, interpersonal cooperation, and growth in creativity, curiosity, initiative, and resourcefulness are all prominent in available literature (Carsrud, et al., 1984; Kardash, 2000; Lopato, 2002; Project Kaleidoscope, 2002). The most often cited goal, however, is the multifaceted ability to understand a research problem well enough to be able to develop questions, assess what information is needed to answer the questions, then obtain that information; and finally, to exercise the skills necessary to communicate the results (Boyer Commission, 1998; Kardash, 2000).

Dissemination of results is the end event for the research process, whether undergraduate, graduate, or professional in nature. Kardash (2000) asserts that undergraduate research is “expected to culminate in a tangible product that is critiqued by other members of the discipline” (p. 191). Most students complete a written report of the finished research, but presenting the report to others is considered the capstone of the experience (Carsrud, 1988; Carsrud, et al., 1984; Friedenberg, 1995; Kierniesky, 1984;

Palladino, et al., 1982). The forum for this presentation is most often a local or regional undergraduate research conference, providing the benefits of a conference experience yet keeping costs and travel time within a feasible range for students (Carsrud, et al., 1984).

The majority of such conferences follow a typical convention format, beginning with a call for submission of papers. Although some conferences are quite selective in paper acceptance, most have lenient standards, taking into consideration the primarily motivational/educational purpose of the undergraduate conference as justification for accepting the majority of papers (Anderson & Rosenfeld, 1988; Carsrud, et al., 1984). In addition to paper sessions moderated by faculty members, poster sessions are generally available. Although presenting a poster possibly produces less anxiety for students, the experience may not provide the resulting sense of achievement and self-confidence attained through oral presentation.

There is some discussion in the literature about the benefits of original research as opposed to faculty-generated research (Carsrud, et al., 1984; Kierniesky, 1984; Palladino et al., 1982). Kierniesky (1984) found roughly twice as many students developing their own research ideas as using faculty ideas and three times more students doing their own projects than participating in a faculty research project. In examining the origin of the research idea in relation to conference presentations, he found that although research that involves “significant faculty input” (p. 17) is more likely to be professionally published or presented, student-originated research is prevalent at undergraduate conferences, suggesting that “originality may come at the expense of the benefits of professional publication and presentation, and vice versa” (p. 18). The conclusions of Carsrud, et al.

(1984) are similar. The argument is one of experience vs. credentials, with each having merits.

The educational value of the undergraduate research experience is clear. Undergraduate research is directed toward the achievement of goals funneling from the broader objectives of education in general, to those of scientific study, to those of the collegiate institution, and narrowing to those specific to the psychology curriculum. The existence and purpose of undergraduate research conferences are well-established, growing, and adapting. In what direction are we moving? Carsrud, et al. (1984) rather casually suggested nearly 20 years ago, "It is interesting to note that surveys of undergraduate psychology research conferences...have consistently indicated that most of the participants come from small or medium sized institutions" (p. 144), but there has been little subsequent attempt to empirically examine this provocative statement.

The purpose of the current study is to assess undergraduate research in today's climate. Are smaller, teaching-centered baccalaureate and masters institutions providing the majority of our undergraduate research presenters? Given the service-directed motives of many psychology majors, are there more presentations in the social/emotional subject domain? My first hypothesis is that more undergraduate research presentations are originating from smaller, baccalaureate colleges than from doctoral research universities. My second hypothesis is that more students are choosing to do research in the applied social/emotional areas of psychology than in other areas.

Method

Officials from five undergraduate research conferences representing different geographical areas of the United States provided data for this project in the form of

conference programs from a 5-year period from 1997 through 2001. These conferences are: (a) Great Plains Students' Psychology Convention, held in Kansas, Nebraska, and Missouri; (b) Mid-America Undergraduate Psychology Research Conference, held in Illinois, Indiana, and Ohio; (c) Mount Holyoke College Annual Undergraduate Psychology Research Conference, held in Massachusetts; (d) Southeastern Undergraduate Research Conference, held in Alabama and Tennessee; and (e) Western Psychology Conference for Undergraduate Research, held in California.

From these programs, the institutions of origin for each presentation were extracted and categorized according to the Carnegie Classification of Institutions of Higher Education. The Carnegie Classification system was originally developed as a research tool in 1973 and last updated in 2000. Institutions are classified as private not-for-profit, or private for-profit organizations. They are also categorized into basic groups of (a) doctoral/research universities, (b) master's colleges and universities, (c) baccalaureate colleges, (d) associate's colleges, (e) specialized institutions, and (f) tribal colleges and universities. These groups are further broken down into specifically defined categories. Because this project only requires the use of the first three categories, they will heretofore be singularly mentioned. These three categories are divided as follows:

1. Doctoral/Research Universities. For the period included in the Carnegie Report (1995-1998) these institutions awarded at least 10 doctoral degrees per year across three or more disciplines.

2. Master's Colleges and Universities. These institutions are committed to education through the master's degree and awarded 20 or more master's degrees per year across three or more disciplines.

3. Baccalaureate Colleges-Liberal Arts. These institutions are primarily undergraduate colleges awarding at least half their baccalaureate degrees in liberal arts fields (as previously identified).

4. Baccalaureate Colleges-General. These baccalaureate colleges awarded less than half of their degrees in liberal arts fields.

In the course of this project, the extracted institutional information was categorized accordingly as either public or private and assigned an institutional type.

Additionally, the title of each research project was recorded and categorized according to the five content domains presented in the National Standards for the Teaching of High School Psychology (2002): (a) history and methods; (b) biopsychological, including biological bases of behavior, sensation and perception, health psychology, and sports psychology; (c) cognitive, including learning, memory, thinking, language, and states of consciousness; (d) developmental; and (e) social-emotional, which includes abnormal psychology, social psychology, motivation and emotion, and individual differences. Because no domain was available for educational/academic psychology, a sixth category was added to include presentations in this field. Interrater reliability was established using Cohen's index kappa (Cohen, 1960) regarding the domain categorization ($K = .67$).

Results

Descriptive statistics were calculated for data from 1375 conference presentations, including specific institutions represented, institutional type (i.e., public vs. private), year presented, type of presentation (i.e., paper, poster, or symposium), whether the presentation was made by an individual or group, subject domain of presentation, and

faculty sponsor. Data from four presentations were discarded because they originated from community colleges rather than 4-year institutions, and data from one university were discarded due to lack of adequate information; thus, 1368 presentations were included in the final analyses. It should also be noted that data were not available for the complete 5-year interval from all the surveyed conferences. Due to this fact, average yearly presentations were calculated for each institution by dividing the institution's total number of presentations by the number of years of available conference information. Additionally, in order to control for differences in the number of potential student presenters, information on institution size was obtained from *U.S. News & World Report* and average number of yearly presentations per 1000 students at each institution was calculated. These listings and calculations are shown in Table 1.

A total of 133 institutions were represented at the sampled conferences. An independent groups t test, equal variances not assumed, conducted on the average presentations per 1000 students indicated that private schools ($M = 1.57$, $SD = 2.08$) were represented at a significantly higher level than were public schools ($M = .34$, $SD = .43$), $t(131) = 4.84$, $p < .001$.

Chi-square goodness-of-fit analyses were conducted to examine the influence of institutional category on number of average yearly presentations. Equal distribution of presentations per student population among categories was assumed in order to generate the expected values (number of students per category was divided by the total number of students at all institutions then multiplied by the total average of yearly presentations). Results, shown in Table 2, indicate significant differences in the observed and expected

values [$\chi^2(3, N = 357.6) = 338.98, p < .001$], with marked underrepresentation by doctoral institutions and overrepresentation by masters and baccalaureate institutions.

A similar chi-square analysis for research subject domain indicates significant overrepresentation of presentations in the social/emotional domain [$\chi^2(5, N = 1368) = 1377.84, p < .001$], as shown in Table 3. All other areas were underrepresented except the cognitive domain.

Paper presentations ($N = 956$) occurred more than twice as frequently as poster presentations ($N = 410$), accounting for 69.9% and 30.0% respectively. Symposia were sparse, with only two represented in the total. Additionally, individual projects ($N = 891$) outnumbered group projects ($N = 477$), 65.1% to 34.9%.

Discussion

Student presentations at undergraduate research conferences appear to be originating most often from private baccalaureate and masters institutions; they are much less likely to come from public or doctoral universities. This finding is consistent with the research of Spencer, Addison, and Schoonover (2000), who investigated undergraduate Psi Chi student presentations at the annual meeting of the Midwestern Psychological Association, finding an overrepresentation of participants from private and liberal arts colleges and an underrepresentation from public and doctoral universities.

As previously stated, private, non-doctoral institutions tend to prioritize education rather than research productivity in their faculty and students. This is not to say that instructors at these institutions are not producing research, just that the emphasis on publication is not as strong. Recent findings of Spencer, Brito, and Addison (2002) show that authors of articles published in *Teaching of Psychology* are much more likely to

come from private and bachelor's degree institutions than from public or doctoral institutions, indicating that even the research from these schools is education-centered.

The availability of faculty mentors may well make a difference in the number of students who participate in the research process. Further studies might do well to investigate the student-faculty ratio and survey psychology departments regarding mentoring opportunities and practices. From observation of the current data, it appears possible that a handful of faculty members from each institution may be sponsoring many (or most) of the student research projects. These instructors could possibly be the driving force behind undergraduate presentations, mentoring and encouraging their students to participate. According to Marklein (2002), when 1600 seniors at Harvard University were surveyed regarding the college experience that had the most impact on them, the most common response (25%) was "a supervised research mentorship" (p. 6D). Mentoring may well be the key to research participation, regardless of institutional category.

An additional recommendation for future study includes the exploration of how many psychology majors are actually participating in research experiences, taking into account voluntary independent study as well as required coursework, expanding on the results of Perlman and McCann (1999b), and Messer, et al (1999). It also might prove productive to replicate Kierniesky's 1984 study, particularly regarding the number of students developing their own ideas and conducting original research as opposed to participating in faculty research, delving into possible differing benefits of each avenue.

The significant overrepresentation of private schools possibly has some financial roots in addition to the previously cited issues. Many public institutions are consistently

underfunded, a condition worsening in today's economic climate. Public colleges and universities might not have funds available for adequate faculty or for providing research equipment and opportunities.

In looking to explain the lack of participation by doctoral universities, one must consider that students from these institutions may indeed be conducting research, but presenting their work in different venues. If these students are working with professors, they may be listed as co-authors on projects presented at professional conferences rather than regional undergraduate conferences. It is also becoming more common to see larger schools holding their own undergraduate research conferences. According to an article in *APA's Monitor on Psychology* (Ballie, 2001), Stanford University held its first undergraduate psychology research conference in the spring of 2001, organized primarily by graduate students, to "support and encourage undergraduate research efforts in the field of psychology" (p. 1). The work of the Boyer Commission has spurred growth in undergraduate research programs at doctoral institutions, but efforts are not well coordinated, and are largely directed toward the best students (Marklein, 2002). Thus, there appears to be progress in this area, but it is slow.

The extreme overrepresentation of research in the social/emotional domain supports the observation that many students enter the psychology major because, as previously stated, they are interested in its applied, service-oriented aspects (Bahrlick, 1994; McGovern & Hawks, 1986; Newman, 1998). As suggested by Bahrlick (1994), and by the Task Force on Undergraduate Psychology (Halonen, et al, 2002) it would be appropriate to make students aware, even at the pre-college level, of the scope of the discipline of psychology.

The future of undergraduate research in psychology is rich with potential. Currently our research presenters are coming mainly from smaller, private, masters and baccalaureate institutions, but there is considerable growth and expansion on the horizon. According to Marklein (2002), the Undergraduate Research and Creative Activities Program at SUNY Stony Brook grew from 596 participants in fall 1998 to 954 in spring of 2001. The responsibility at hand, then, rests with all educators. Those who are participating in successful undergraduate research programs have the responsibility to enhance their growth, both within and outside of their own institutions. Psychology departments without undergraduate research programs or opportunities have the responsibility to consult with those who do and model their successes.

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Table 1

Colleges or Universities Represented at Sample Undergraduate Research Conferences

Ranked by the Number of Presentations per 1000 Students at Each School.

Rank ^a	College or University	Presentations per 1000 ^b	Average Presentations ^c	Undergrad Population	Carnegie Category ^d	Institutional Type
1	Wabash College	11.8	10.0	849	B-LA	Private
2	Westminster College	6.8	5.2	768	B-LA	Private
3	Oakwood College	6.7	12.0	1,778	B-G	Private
4	Franklin College	6.4	6.6	1,028	B-G	Private
5	Mt. Holyoke College	6.0	12.3	2,037	B-LA	Private
6	Nebraska Wesleyan	4.9	8.0	1,621	B-LA	Private
7	Bellarmino University	4.6	11.4	2,470	M	Private
8	Mills College	4.0	3.0	742	B-LA	Private
9	Earlham College	3.7	4.0	1,078	B-LA	Private
10	Westmont College	3.0	4.0	1,374	B-LA	Private
11	Thomas More College	2.7	3.8	1,422	B-G	Private
12	Santa Clara University	2.6	11.0	4,279	M	Private
13	Creighton University	2.5	9.2	3,679	M	Private
14	St. Meinrad College	2.4	.6	250	B-G	Private
15	Rockhurst College	2.4	4.8	2,011	M	Private
16	Samford University	2.4	7.0	2,890	M	Private
17	Friends University	2.3	6.0	2,629	M	Private
18	University of Evansville	2.2	5.6	2,542	M	Private
19	Cedarville College	2.2	6.6	2,943	B-G	Private

20	Oklahoma Christian Univ.	2.1	3.6	1,714	B-G	Private
21	Univ. of Nebraska Kearney	1.9	10.2	5,407	M	Public
22	Park College	1.8	1.8	1,000	M	Private
23	Missouri Western State	1.7	8.6	5,102	B-G	Public
24	Eureka College	1.5	.8	514	B-G	Private
25	Newman University	1.4	3.0	2,071	M	Private
26	Hanover College	1.3	1.4	1,111	B-LA	Private
27	Central Methodist College	1.3	1.6	1,226	B-G	Private
28	Doane College	1.3	2.0	1,539	M	Private
29	St. Mary's College	1.2	3.0	2,497	M	Private
30	Wayne State College	1.2	3.4	2,835	M	Public
31	Washburn University	1.2	6.2	5,098	M	Public
32	Eastern Illinois University	1.2	11.0	9,115	M	Public
33	Rockford College	1.1	1.2	1,056	M	Private
34	Benedictine College	1.1	1.4	1,297	M	Private
35	University of St. Francis	1.1	1.6	1,484	B-LA	Private
36	California Lutheran Univ.	1.1	2.0	1,846	M	Private
37	Univ. of Nebraska Lincoln	1.1	19.4	17,985	D	Public
38	Bethany College	1.0	.6	622	B-LA	Private
39	Jacksonville State Univ.	1.0	7.0	6,868	M	Public
40	Antioch College	.9	.6	682	B-LA	Private
41	Seattle University	.9	3.0	3,352	M	Private
42	University of Montevallo	.8	2.0	2,559	M	Public
43	Emporia State University	.8	3.6	4,287	M	Public
44	Missouri Southern State	.8	4.6	5,899	B-G	Public
45	De Pauw University	.7	1.6	2,219	B-LA	Private

46	Seattle Pacific University	.7	2.0	2,828	M	Private
47	Madonna University	.7	2.0	3,043	M	Private
48	Fort Hays State University	.7	3.0	4,565	M	Public
49	Univ. of Southern Indiana	.7	6.4	8,783	M	Public
50	Vanguard University	.6	1.0	1,578	B-G	Private
51	Baker University	.6	1.2	1,903	M	Private
52	Wittenberg University	.6	1.4	2,284	B-LA	Private
53	Bellevue University	.6	2.0	3,205	M	Private
54	Eastern Nazarene College	.5	.3	620	M	Private
55	Marian College	.5	.6	1,255	B-G	Private
56	Spelman College	.5	1.0	2,139	B-LA	Private
57	Palm Beach Atlantic College	.5	1.0	2,216	M	Private
58	Webster University	.5	2.0	3,760	M	Private
59	Worcester State College	.5	2.7	4,915	M	Public
60	Univ. of Alabama Huntsville	.5	3.0	5,466	D	Public
61	Northeastern State University	.5	3.8	7,490	M	Public
62	Purdue University Calumet	.5	3.8	8,120	M	Public
63	William Jewell College	.4	.4	1,089	B-LA	Private
64	Missouri Valley College	.4	.6	1,577	B-G	Private
65	Amherst College	.4	.7	1,638	B-LA	Private
66	Connecticut College	.4	.7	1,835	B-LA	Private
67	Point Loma Nazarene	.4	1.0	2,353	M	Private
68	Indiana University Kokomo	.4	1.0	2,519	B-G	Public
69	Southern Oregon University	.4	2.0	4,890	M	Public
70	SUNY Oneonta	.4	2.0	5,458	M	Public
71	Northern Kentucky Univ.	.4	4.6	11,269	M	Public

72	Tabor College	.3	.2	571	B-G	Private
73	Stephens College	.3	.2	618	B-LA	Private
74	University of Indianapolis	.3	1.0	2,854	M	Private
75	Azusa Pacific University	.3	1.0	3,654	M	Private
76	Pittsburg State University	.3	1.6	5,471	M	Public
77	Indiana Wesleyan University	.3	1.6	5,721	M	Private
78	St. Louis University	.3	2.0	7,228	D	Private
79	Univ. of Alabama Birmingham	.3	3.0	9,954	D	Public
80	Wichita State University	.3	3.6	11,303	D	Public
81	California State Univ. LA	.3	4.0	13,898	M	Public
82	Southwest Missouri State Univ.	.3	4.4	15,147	M	Public
83	Indiana U-Purdue U Indianapolis	.3	7.0	20,695	D	Public
84	Goshen College	.2	.2	984	B-LA	Private
85	Southwestern College	.2	.2	1,175	B-G	Private
86	Maryville University	.2	.4	2,632	B-G	Private
87	Alabama A & M	.2	1.0	4,671	D	Public
88	Northwest Missouri State Univ.	.2	1.2	6,200	M	Public
89	Univ. of California Santa Cruz	.2	3.0	12,034	D	Public
90	Eastern Kentucky University	.2	2.6	12,804	M	Public
91	California State Univ. Chico	.2	3.0	14,634	M	Public
92	UCLA	.2	4.0	25,328	D	Public
93	Concordia University	.1	.2	1,358	M	Private
94	Evangel University	.1	.2	1,529	B-G	Private
95	Colorado College	.1	.2	1,934	B-LA	Private
96	Barnard College	.1	.3	2,261	B-LA	Private
97	Stonehill College	.1	.3	2,613	B-G	Private

98	Smith College	.1	.3	2,665	B-LA	Private
99	Univ. of Wisconsin Platteville	.1	.8	5,154	M	Public
100	Stanford University	.1	1.0	7,279	D	Private
101	Central Missouri State Univ.	.1	1.0	9,068	M	Public
102	University of Miami	.1	1.0	9,359	D	Private
103	Univ. of Wisconsin Osh Kosh	.1	1.2	9,414	M	Public
104	California State Univ. Hayward	.1	1.0	9,528	M	Public
105	University of Louisville	.1	1.4	14,109	D	Public
106	University of Alabama	.1	2.0	15,201	D	Public
107	Cal Poly San Luis Obispo	.1	2.0	17,066	M	Public
108	Auburn University	.1	2.0	18,922	D	Public
109	Oklahoma State University	.08	1.4	17,211	D	Public
110	Westfield State College	.07	.3	4,378	M	Public
111	University of Wyoming	.07	.6	8,929	D	Public
112	SUNY Geneseo	.06	.3	5,371	M	Public
113	California State Univ. Fresno	.06	1.0	16,086	M	Public
114	Bridgewater State College	.05	.3	7,199	M	Public
115	Univ. of Missouri Kansas City	.05	.4	8,299	D	Public
116	Metropolitan State College	.05	1.0	18,445	B-G	Public
117	New York University	.05	1.0	19,028	D	Private
118	Boston College	.04	.3	9,000	D	Private
119	Wright State University	.03	.4	10,562	D	Public
120	Kansas State University	.03	.6	18,770	D	Public
121	Murray State University	.02	.2	7,763	M	Public
122	Northwestern University	.02	.2	7,816	D	Private
123	Univ. of Northern Colorado	.02	.2	10,161	D	Public

124	Southern Illinois Univ.-C	.02	.4	16,802	D	Public
125	Univ. of Massachusetts Amherst	.02	.3	19,368	D	Public
126	Purdue University	.02	.6	30,987	D	Public
127	Mississippi State University	.01	.2	13,604	D	Public
128	Ball State University	.01	.2	16,535	D	Public
129	Univ. of Missouri Columbia	.01	.2	18,431	D	Public
130	University of Cincinnati	.01	.2	19,841	D	Public
131	Rutgers University	.01	.3	28,351	D	Public
132	Univ. of Michigan Ann Arbor	.008	.2	24,547	D	Public
133	Ohio State University	.005	.2	36,049	D	Public

^a Ascending order according to number of presentations per 1000 students

^b Number of presentations per 1000 undergraduate students at each institution

^c Average number of presentations per year for each institution

^d D = Doctoral, M = Masters, B-LA = Baccalaureate-Liberal Arts, B-G = Baccalaureate-General

Table 2

Chi-Square Analysis for Number of Presentations by Institutional Category

Carnegie Category	Total Students	Average Yearly Presentations	Expected Presentations	χ^2
Doctoral	513,825	61.3	199.47	
Masters	319,513	184.3	124.05	
B-Liberal Arts	32,034	57.7	12.44	
B-General	55,770	54.3	21.63	
				338.98**

** $p < .001$

Table 3

Chi-Square Analysis for Research Domain

Domain	Actual Number of Presentations	Expected Number of Presentations	χ^2
Methods/History	43	228	
Biopsychological	124	228	
Cognitive	220	228	
Developmental	148	228	
Social/Emotional	726	228	
Educational	107	228	
			1377.84**

** $p < .001$