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Student experiences in PhD programs: How to do interdisciplinarity at doctoral level

By Karri A. Holley, Assistant Professor, College of Education, University of Alabama

Historically, the doctoral degree has been part of the disciplinary structure of American higher education. Students are trained to the most specialized levels of inquiry within particular fields of study. By assuming faculty positions in academic departments, doctoral recipients continue the disciplinary lineage, promoting knowledge and behavior reflective of the field for a new generation of students. Despite its international preeminence, the model of doctoral education in the United States is not without its critics. Over the past two decades, increased acknowledgment has been given to the disciplinary limitations of the PhD. An influential 1995 report from the National Academy of Science, for example, highlighted the need for researchers in science and engineering fields to be able to collaborate with peers from other disciplines as well as engage in interdisciplinary research. The Woodrow Wilson Foundation (2005), as part of its Responsive PhD project, focused on the need to balance the depth of the disciplinary doctorate with the breadth of interdisciplinary capabilities, a challenge echoed by the National Science Foundation (2006) and the National Institutes of Health (2008). The

balance is a delicate one made even more challenging by the perceived economic, social, and cultural demands associated with academic research and knowledge production.

It is significant to note, however, that doctoral programs do exist that have engaged in interdisciplinary work for some period of time. Women's studies, neuroscience/cognitive studies, and self-designed interdisciplinary studies programs are just a few examples of doctoral curricula that reflect interdisciplinary influences. Less than 1 percent of American doctoral degrees are awarded through Interdisciplinary Studies programs (National Center for Education Statistics, 2007). Yet they provide a rich example of how interdisciplinarity can be accomplished on a doctoral-level as well as lessons for faculty and administrators interested in cultivating interdisciplinary engagement across graduate programs. I conducted a case study analysis of one PhD program in Interdisciplinary Studies at Southwestern University. (The institution is not named in this article, and pseudonyms are used to protect participants' identity.) Through 10 interviews with prospective students, current students, program
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Come to Tuscaloosa for 31st AIS conference



The 31st annual AIS Conference, will be October 8-11, 2009, on the University of Alabama campus in Tuscaloosa, hosted by the New College program, the College of Arts and Sciences, and the Creative Campus Project at the University of Alabama. "Creativity and Play Across the Disciplines," this year's theme, will be explored in 50 panels, workshops, and roundtables. Special attractions will include a Showcase of Alabama Music on Friday, and a choice of excursions to the Moundville Archaeological Park, the Westervelt-Warner Museum, or a Campus Civil Rights Tour on Saturday. A detailed agenda is now available on the conference website, <http://aisconference.ua.edu>. ■■■

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Student experiences in PhD programs ...

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alumni, and faculty, I examined student motivation for enrollment, how the program facilitated interdisciplinary work, and the influence of faculty and peers on student experiences.

Doctoral student experiences are frequently examined through the framework of socialization theory. Socialization is “a cultural process that involves the exchange of patterns of thought and action” (Tierney & Rhoads, 1993, p. 21). Newcomers to an organization (in this case, students entering a doctoral program) become immersed in the norms, behaviors, and values that define the community. These hallmarks are typically disciplinary in nature and are reflected in the curriculum, professional conferences, research activities, and social networking. For example, doctoral students in physical and hard science disciplines almost immediately become part of a laboratory research team, while their peers in the humanities and certain social science areas perform as solitary researchers on particular topics. Doctoral student retention is related to the degree that individuals match disciplinary norms, and become incorporated into the daily activities of the community (Golde, 2000).

One challenge for students in an interdisciplinary doctoral program is the engagement required with faculty and peers from multiple disciplinary communities. This challenge is in part structural: The university is constructed with academic departments and disciplinary programs as the accepted norm. Interdisciplinary work requires a change to the accepted structure that has long ordered the development of academics. Beyond the prevailing disciplinary structure, however, doctoral students in interdisciplinary programs are faced with cultural and professional obstacles. For example, how do students construct an interdisciplinary curriculum reflective of their field of study? How do doctoral students in an interdisciplinary

program secure funding, frequently allocated by individual faculty and departments? How do these students garner teaching experience, when introductory undergraduate classes have long been based in the disciplinary organization? These questions underscore the highly disciplinary nature of “interdisciplinarity.” Although students may be engaged in an interdisciplinary field of study, the structure, culture, and history of the university ensures that the field of study is embedded within the disciplines (Holley, 2009).

Program background and student motivation for enrollment

The Interdisciplinary Studies PhD program at Southwestern University represents a very small percentage of doctoral students at the institution. Its goal is to provide advanced study for students only in areas where the traditional disciplines do not suffice. Students are required to submit a detailed program of study and research prospectus before admission and also identify faculty and coursework from at least two campus departments that support their interdisciplinary interests. The faculty committee, which is identified by the student (and also serves as the dissertation committee), works to ensure a robust program of study. Students are motivated to enroll in the program based on experience with an interdisciplinary undergraduate or master’s degree, or through advice from a faculty mentor. One student, Susan, who is completing her first year in the program, identified her academic background in interdisciplinary areas as a positive influence. “My research interests are so broad, but I was able to fit them together before, so I know it can be done,” she concluded. She studied English as an undergraduate, and completed a self-designed master’s program in Africana and women’s studies. “I was really able to integrate all the things I wanted to do,” she explained. Quincy, who is preparing to

defend her dissertation, noted that she could not find a traditional program that accommodated her multiple interests in criminal justice, political science, education, and psychology. A professor in her master’s program recommended that she apply to the Interdisciplinary Studies PhD. Grady, who is a recent applicant to the program, felt that the interdisciplinary curriculum would complement his master’s degree in theology. “I’ve had a hard time picking just one thing. Language, history, psychology, biblical studies, philosophy, I think they all relate to the study of religion,” he said.

Having an enthusiastic faculty mentor was mentioned as an important influence for interdisciplinary doctoral study by several students. Deanna is a current student in the program, and recently celebrated her 70th birthday. “I knew this is what I wanted to do,” she said. “I did an undergraduate degree here, and they were my family. [The faculty] there encouraged me to go on for my PhD, and to use this program to do what I wanted.” Faculty and administrators identified support from professors as a crucial element of student persistence in the program. “Because there is no home department and often no dedicated funding source, students can really drift. The completion rate is not high. Students need a community to do well,” said Dr. Haginas, who worked in the graduate school when the Interdisciplinary Studies PhD program was first developed over a decade ago.

Facilitating doctoral student engagement in an interdisciplinary program

All of the participants emphasized the challenges involved in achieving an interdisciplinary curriculum within the traditional university structure. “Students really need to be autonomous,” Susan explained. “There’s so much upfront work in the application process.” Dr. Albini, who currently facilitates the program as part of her administrative responsibilities within the Graduate School, noted that the

numerous steps required for application (which exceed those of almost all of the traditional PhD programs on campus) often dissuade students from applying. Grayson, a recent applicant, confided that his initial efforts to contact faculty on campus had met with failure. "I talked to so many professors who didn't even know the interdisciplinary program existed," he said. "Others tried to discourage me from applying, saying that I wouldn't be marketable."

Faculty and administrators agreed that the program did little to explicitly assist students in terms of interdisciplinary experiences. Dr. Albin explained, "It's really up to students to make connections with faculty and peers." Students developed their programs of study by working with a faculty advisor. "The committee is based on different disciplines, and it should be the committee that decides on the student's coursework...but having the right chair is really crucial," concluded Dr. Wilson, a professor from the College of Arts and Sciences. Faculty seemed to participate in the program based on their sense of obligation to graduate students as well as their belief in the innovative potential of interdisciplinary work. No financial rewards or institutional benefits were offered for working with students in the Interdisciplinary Studies PhD program. Not surprisingly, the same small group of faculty (predominantly tenured, senior professors) was most commonly identified as those involved with the program.

Several students highlighted the challenges of staying "on track" once they started the program. This challenge was in part due to the lack of a home department. None of the current students interviewed for this study knew the participants other than by name. Students instead referenced relationships with faculty and peers from specific disciplines, usually those most closely associated with the student's interdisciplinary interests. Without an interdisciplinary community, students felt lost amid the university structure. "I felt completely on my own,"

Quincy summarized. Her initial advisor passed away not long after she began the program. "No one else even knew I existed. There was no longer a chair, and I wasn't really sure of the steps I should take to get one."

The impact of faculty and peers on student experiences

A recurrent theme throughout this study was the need for doctoral students in the Interdisciplinary Studies program to develop their own community. Deanna concluded, "You have to do it yourself, find professors and friends who share your interests and support your work." She attributed her status as a 70-year-old doctoral student with her success in the program. "It can be hard for a young person to put a program together," she added. "If you don't have the lived experience to bring to the table, I think it can be hard to articulate what you need from people." Frequently, the sense of community was embodied by individuals associated with the various constituent disciplines. The community was not only a social one, but also one that provided financial resources and intellectual camaraderie. At this university, however, graduate student benefits such as teaching and research assistantships are primarily concentrated at the departmental level, leaving those students in the Interdisciplinary Studies PhD program without a dedicated source of support. Even the personal and professional connections with faculty and staff were lacking. Susan explained, "I don't have a connection with faculty. Even [the original professor] who agreed to be my advisor, she really didn't have any knowledge of the program and wasn't very supportive." Quincy identified most closely with the criminal justice department, but added, "I always have to remind the chair who I am when I see her, and that I'm still around. I don't think she has ever seen me as one of 'their' students."

For doctoral students, faculty and peers are more than just a physical location and a social support system. Such a

community also serves as a cultural reference point, allowing students to mark their progress to the degree as well as define and pursue their professional aspirations. A common theme from the interviews was the question of marketability and future opportunities for program graduates. Dr. Haginas explained, "An interdisciplinary program at this level is not like an undergraduate program. You need a career goal, and an informed idea of how the [Interdisciplinary Studies PhD] can help you get there." One interesting exception emerged, however: While the university does not offer a PhD in criminal justice, several students pursued the Interdisciplinary Studies PhD with this interest in mind. Two recent graduates secured faculty positions at regional, four-year institutions in criminal justice departments.

Conclusions and implications for Interdisciplinary Studies PhD programs

As universities are encouraged to provide interdisciplinary opportunities for graduate students and faculty, this study offers several significant lessons for design and implementation. The Interdisciplinary Studies PhD program at Southwestern University was not affiliated with an academic department or administrative unit on campus. The lack of ownership by any group on campus resulted in uncertainty and frustration for students. While interdisciplinary programs may not have a dedicated location on campus, I suggest the consideration of an organizational structure that is transparent and accessible as a means to ensure student success. Although the SWU Graduate School directed program admissions, little effort was made to systematically support, organize, or advise students after they were admitted. One attribute of the disciplines that works to support doctoral student retention is the development of a scholarly community. The deliberate construction of such a community is perhaps even

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more essential for interdisciplinary doctoral education, particularly when a home department or location is not available. Given the lack of a dedicated community, the students enrolled in the Interdisciplinary Studies PhD program frequently found affiliations with faculty and peers from the closest constituent discipline.

In addition, faculty received no benefits from their home department for working with doctoral students in the interdisciplinary program. Because it was not well publicized, few faculty on campus even knew the program existed. The involvement of faculty from multiple disciplines is necessary to ensure the success of the program as well as its interdisciplinary nature. Finally, those doctoral students

associated with the program felt cut off from opportunities designed to socialize them to the academic profession. The responsibility for doctoral student socialization does not lie solely with the academic department. Particularly from a program such as this, the university is required to provide intellectual, social, and personal support.

What institutional recommendations might be gained from this study related to developing and supporting an Interdisciplinary Studies PhD program? First, affiliation with a department or center on campus can serve to bolster the program. The lack of ownership by any campus group negatively impacts the student experience. Also, the program curriculum should reflect the deliberate, intentional nature of the interdisciplinary process. One option is to provide a required seminar on interdisciplinarity during the first semester of the student's enrollment; the institution might also host a series of informal lunches related to interdisciplinarity, research, and writing. These activities could be open to all graduate students, enabling a greater sense of community for those individuals enrolled in the Interdisciplinary Studies PhD program. Third, universities must recognize that, when the academic department is removed as the primary influence of doctoral student socialization, the institution must provide structured, ongoing support. This support includes GTA or GRA funding, office space, a peer network, and travel resources. In addition, offering faculty benefits for working with doctoral students in the interdisciplinary program might increase support for the program from the departments. These benefits do not have to be monetary. But they can serve as institutional acknowledgment of the significance of interdisciplinary work for faculty and doctoral students. Greater institutional recognition may offer increased legitimacy to the degree. Finally, doctoral programs in Interdisciplinary Studies should

reflect a small percentage of the total graduate student enrollment at any institution. At Southwestern University, student admissions were guided by the individual's qualifications for acceptance into any degree program as well as interests that are strongly interdisciplinary (and not reflected in an existing doctoral program). The exceedingly small nature of the degree is befitting its mission and goals.

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AAC&U 'Integrative Learning' conference October 22-24, 2009

"Integrative Learning: Addressing the Complexities" is the theme of the Association of American Colleges and Universities (AAC&U) Network for Academic Renewal conference. The conference will be October 22-24, 2009, in Atlanta, Georgia.

The Association for Integrative Studies has been named the Academic Partner for the conference, and members of the AIS Board of Directors will lead four of the sessions.

For information on registration, hotel, and the preliminary program, go to http://www.aacu.org/meetings/integrative_learning/

AJPM Special Supplement explores: Interdisciplinarity and the Science of Team Science

Review of The Science of Team Science Assessing the Value of Transdisciplinary Research, a special supplement of the *American Journal of Preventive Medicine* edited by D. Stokols, K.L. Hall, B.K. Taylor, R.P. Moser & S.L. Syme, American College of Preventive Medicine, Association for Prevention Teaching and Research, 35(Suppl. 2), August, 2008.

Reviewed by Sharon B. Buchbinder, RN, PhD, Professor and Chair, Department of Health Science, Towson University, Towson, Maryland.

This special issue of the *American Journal of Preventive Medicine (AJPM)* was dedicated to the exploration of how interdisciplinary and transdisciplinary teams work, i.e., the science of team science, particularly as it applies to the world of preventive medicine and public health. The articles in this issue were drawn from the National Cancer Institute National Institutes of Health Conference on the Science of Team Science in Bethesda, Maryland, during October 2006. As I read, a series of questions came to mind, providing me with a framework for examination of this topic. By using these issues to guide my review, I hope to contribute to the discussion and to provide the reader with an understanding of this special issue of *AJPM*.

What are they and why do we need interdisciplinary teams and teamwork?

This issue of *AJPM* began by defining the terms, **undisciplinary**, **multidisciplinary**, **interdisciplinary**, and **transdisciplinary**. Several authors reiterated these definitions throughout the journal (Klein, 2008; Hall, Feng, Moser, Stokols & Taylor, 2008; Hall, Stokols, Moser, Taylor, Thornquist, Nebeling et al., 2008; Mabry, Olster, Morgan, & Abrams, 2008; & Stokols, Hall, Taylor & Moser, 2008). This was not happenstance. The authors wanted the audience to know exactly what they meant with the terminology. As Newell (2007) wrote, it is important to agree on a working definition because it impacts what we do, how we do it, and who we bring

to the party. People involved in research teams need to know upfront what the expectations are. Based on the articles and definitions from the above noted authors, here's my interpretation of how to explain the distinctions to a colleague. If you want to be alone in your silo, working only with like researchers, you are a **undisciplinarian**. If you like working with other disciplines to address an issue, but don't feel the need to learn new constructs and theories, then you will probably be happy in a **multidisciplinary** team. If you are interested in learning more about other disciplines and are willing to take a risk and cross boundaries of potentially conflicting theories and constructs, you might enjoy working on an **interdisciplinary** team. If you want to build new theories, products, sciences and ways of knowing the world and the problems to be solved, then you may also enjoy working on a **transdisciplinary** team.

A number of authors appeared to have used the terms **interdisciplinary** and **transdisciplinary** interchangeably. The distinctions, however, are important in terms of evaluation of outcomes, so I would argue that it is critical to explicitly state the expectations (à la Newell) to be sure everyone is on the same page. If we say we are going to create a new science with our transdisciplinary team and if we are funded to do so, we will be measured by the yardstick of transdisciplinarity. On the other hand, if we say we are an interdisciplinary team and have some happy byproducts that are new, we have exceeded our goals

and not failed at them. Bottom line: Know what the definitions are and be mindful of how the team will be evaluated.

All of the authors in this special issue spoke resoundingly to the need for interdisciplinary teams to solve real-world preventive medicine and public health vexing problems, which are complex, complicated, and messy. Rittel and Webber (1973, p. 160), writing on planning, first dubbed these "wicked problems." Drinka and Clark (2000, p. 37) wrote about "tame versus wicked problems." Tame problems can be defined; wicked problems are difficult to define and not easily resolved. You need to have every involved area's input to analyze a wicked problem, because it won't be solved by one person—or one discipline. Most problems fall along the continuum of tame to wicked, with many levels of messiness along the way. Conklin (2006) speaks of fragmentation as a result of vexing, wicked problems interacting with social complexity. Having only one discipline's community examining an issue, problems can actually be exacerbated, rather than ameliorated. By having side-by-side disciplines staring at their pieces of the puzzle, but not truly crossing boundaries, problems are addressed in a piecemeal, not a holistic manner. Hence the pressing need now for interdisciplinary and transdisciplinary teams to solve these vexing problems—despite the myriad of obstacles to planning, organizing, implementing, and evaluating such teams.

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The Science of Team Science...

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What are the obstacles to and facilitators of interdisciplinary teamwork?

As critical as it is to succeed in solving our wicked, vexing problems there are significant barriers to enticing people to work in the vineyards of interdisciplinary research. We must be prepared to answer the important question: “What’s in it for me?” Stokols, Misra, Moser, Hall and Taylor (2008, pp. S107-S109) explicitly delineated the “facilitating and constraining factors” and the “key contextual factors influencing transdisciplinary team effectiveness.” Some of the constraints included: “Groupthink”; size of team for problem; communication issues; attitudes and values of team members; inadequate infrastructure and technology; conflicts between research models; lack of experience, skills, and training; and lack of ongoing institutional supports and rewards for collaboration, including promotion and tenure considerations for multi-authored publications/products and time.

Some of the facilitators included: shared vision; clear goals; shared principles; cohesiveness and continuity of working relationships; organizational support and rewards for collaborative processes and outputs; individual researchers’ readiness for collaboration; excellent infrastructure and communication networks; opportunities for face-to-face meetings; prior positive experience with teams, enthusiastic leadership; and incentives to participate and remain involved, including external validation of the work accomplished by the team, and time.

While not explicitly stated by Stokols and his colleagues, I would suggest their charts could provide a checklist to assess if organizations and individuals who are proposing a project are ready for interdisciplinary teamwork. It takes time to build a truly interdisciplinary or transdisciplinary team, to build trust, infrastructure, and rewards. A good wine cannot be grown in bad *terroir*. The soil, water, weather, and vines must work together

in context to produce a palate pleaser. Likewise, interdisciplinary teams require good *terroir*.

What is the best way to select team members and leaders for interdisciplinary teams?

Gray (2008) spoke to the need to enhance transdisciplinary research through collaborative leadership. She identified the challenges associated with leading a team of such diverse individuals and of the need to cut across and through the silos. Not only does this leader need the ability to identify the wicked problem with conceptual and cognitive skills and abilities, this person must understand the structural tasks at hand and the process challenges. The type of project will certainly help to determine the choice of a leader, but ensuring the success of the project depends on the dance between the leader and the followers, where he or she takes turns with others depending on the needs of the project at hand. The ability to step back and say, “I’m not the best leader for this portion of the project” is key. Along with the project itself, the outcomes (publications in most instances) will also be determined by how well the leader and the team interact.

Nash (2008) spoke to the need for training researchers early in their careers to participate in interdisciplinary teams. Although not reaching back to the baccalaureate level as Newell (1998, 2007) might recommend, Nash does address the importance of good doctoral and post-doctoral transdisciplinary experiences with mentors who are comfortable with the process. He addresses the importance of communication and trust in the training process as well as infrastructure and organizational supports and rewards for teamwork.

It was interesting to me that not one author identified **emotional intelligence (EI)** as an area that could be used to assist with interdisciplinary team talent identification, recruitment, and retention. Stokols, Hall, Taylor & Moser (2008, p. S81)

brushed up against EI with “social and interpersonal processes” and “collaborative styles and behaviors.” The business world has long utilized the Myers-Briggs and emotional intelligence assessment tools to select executives who will fit the corporate team (Wideman, 2003; Consortium for Research on Emotional Intelligence in Organizations, 2009). Perhaps it’s time for the scientific community to consider using these tools to help select the right people for interdisciplinary and transdisciplinary research teams.

How do we measure process and outcomes of interdisciplinary teamwork?

Klein (2008, p. S122) reviewed the literature on interdisciplinary and transdisciplinary research and found a wide range of contexts for such work. She addressed the terminology (interdisciplinary versus transdisciplinary) and found seven areas emerged: “variability of goals, variability of criteria and indicators, leveraging of integration, interaction of social and cognition factors in collaboration, management and coaching, iteration and transparency in a comprehensive system, effectiveness and impact.” Within these areas, she identified key issues and offered interpretations of what she found.

Mâsse, Moser, Stokols, Taylor, Marcus, Morgan et al. (2008) provided a set of metrics with which to measure the processes of collaboration and integration in interdisciplinary teams. With these tools, one can assess the progress of the team toward integration and the satisfaction of team members with the experience—including the creation of new knowledge and products. As a professor who is constantly exhorting her students on the importance of team work and has a few rubrics of her own to assess in-class team experiences, this is one of the articles I will use to drive home the point *once again* that interdisciplinary team work is critical in health care.

Network approaches to evaluation of transdisciplinary and interdisciplinary teamwork offer opportunities for re-

searchers to be better informed about the process of collaborative efforts. Provan, Clark and Huerta (2008) examined transdisciplinarity among tobacco harm-reduction researchers and identified those disciplines that were more likely to work within their own community and those that were more likely to work across disciplines. They also found there were some individuals who were relationship “brokers,” i.e., almost matchmakers, who would connect researchers to each other. These relationships often led to joint publications, an important outcome measure. The authors suggested that improved understanding of research networks will enable policy makers to encourage more transdisciplinarity.

Systems and data issues plague us with respect to inter-institutional collaboration and research. Holmes, Lehman, Hade, Ferketich, Gehlert, Rauscher et al. (2008) delineated the complexity of trying to have common definitions in data collection with health disparities research. Across institutions and across systems data collection and analyses are problematic, creating concerns with outcomes evaluation. While multilevel methods and systems approaches have the most to offer with respect to holistic views of vexing, wicked problems, these authors urged us to work at common definitions and datasets so we can offer *appropriate* solutions to problems and assess our efforts as well.

What are the next steps for interdisciplinary teamwork?

A number of authors recommended that we should study the successful interdisciplinary and transdisciplinary projects and learn from them. Some of these exemplars are: reduction of tobacco use in the U.S., weather forecasting, and creation of the public health network to prevent and reduce the risk of a future pandemic (Leishow, Best, Trochim, Clark, Gallagher, Marcus et al., 2008, p. S202). These areas brought together interdisciplinary teams of experts who were interested in and willing to “de-

velop and apply systems methods and processes, worked to build and maintain network relationships, built system and knowledge capacity, and encouraged transformation to a systems culture.” The results of their efforts addressed problems that crossed not only disciplinary boundaries, but also national ones.

Perhaps the most readily accessible and highly engaging exemplar of success is the Harvard Center for Cancer Prevention’s interactive website, YourCancerRisk, now called “Disease Risk Index @ Harvard School of Public Health” available at <http://www.diseaseriskindex.harvard.edu/update/english/> (Emmons, Viswanath & Colditz, 2008). This project “brought together clinicians, epidemiologists, behavioral scientists, and decision scientists.” The plan was to help individuals to calculate their disease risk—but they quickly discovered that computer-based calculations and technology would enable everyone access to risk estimations, not just those who were good at math. The key to the success of this effort was the inclusion of the community as equal partners. As a result, the project addressed community concerns in a timely manner.

The calls for collaboration in health care have increased as the recognition that patient safety and quality of care outcomes depend on setting aside professional differences and working together in interdisciplinary teams (Drinka & Clark, 2000; Freshman, Rubino & Chassiakos, 2010). Based on this issue of *AJPM*, it appears that many in preventive medicine have bought into the idea of interdisciplinary and transdisciplinary research. The challenge will be to ensure that others not present at this conference or reading this journal will receive the message, too.

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IDS conference explores contexts of psychiatric care

The fourth FPR-UCLA Interdisciplinary Conference will focus on “Cultural and Biological Contexts of Psychiatric Disorder: Implications for Diagnosis and Treatment.” The conference will be January 22-24, 2010, at University of California, Los Angeles. The early registration deadline is November 13, 2009. For more information, go to the conference webpage, <http://www.thefpr.org/conference2010/overview.php>.

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