

Developing Pediatric Psychology Science and Application Competencies in Doctoral-Level Graduate Programs: Timing and Sequencing of Training at the University of Georgia

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Pediatric psychology competencies were recently defined. There remains discussion about the timing of specialization and sequencing of training experiences in doctoral programs to optimally develop these competencies. A developmental model of training within the Science and Application clusters (Palermo, Janicke, et al., 2014) is presented with reference to sequencing of specific training experiences, timing of specialization, and outcome data over the past 5 years for individuals completing the doctoral program at the University of Georgia. This training model involves a progression from developing broad-based, clinical psychology competencies in early training to increased focus on pediatric psychology competencies over time.

Keywords: competence, doctoral training, pediatric psychology, specialization

Doctoral-level graduate training in pediatric psychology is a time of significant professional development. A primary goal during this period is to obtain skills, knowledge, and abilities necessary to be a competent pediatric psychologist. The Task Force on Competencies and Best Training Practices in Pediatric Psychology recently identified six primary competency clusters for pediatric psychology trainees to obtain (Palermo, Janicke, et al., 2014) to promote optimal outcomes. The definition of these competencies prompted discussion about the timing and sequencing of pediatric psychology specialization during training (Cohen, 2014; Steele, Borner, & Roberts, 2014). The Science and Application clusters are particularly relevant to the sequence and timing of specialization within the graduate training program at the University of Georgia. Graduate students at our program attain these competencies by completing a delineated progression of training experiences in Science and Application with increasing specialization in pediatric psychology over time.

Our training model reflects the perspective of a pediatric psychology research laboratory with multiple pediatric clinical externship opportunities, within a clinical psychology doctoral program at a public university. The University of Georgia's doctoral program has one training track in clinical psychology rather than designated pediatric, child clinical, adult clinical, or other tracks. However, there are clear opportunities to specialize in pediatric psychology research and application. The current sequence and timing of our program was adopted approximately 5 years ago, and includes 5 years on-campus before entering a 1-year internship in pediatric psychology. Previously, students spent 3 years on campus, completed internship in the fourth year, and returned to campus in the fifth year to complete the dissertation and other studies. We believe that the current training sequence provides students with greater opportunity to develop competency in Science and Application before beginning internship and entering the profession. To demonstrate the efficacy of this model and sequence, we present student outcome data from the past 5 years. Outcome data were obtained by reviewing and coding information from vitas provided by the graduates over the past 5 years (2010–2015; outcome data include means and percentages).

Although the exact program sequence has shifted in the past 5 years, the approach to

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training has always involved forming a strong base of Science and Application cluster competencies in early graduate school, which serve as the foundation upon which specialization in pediatric psychology research and clinical activities is developed in later training. We view this process as a shaping procedure, with basic competencies facilitating acquisition of pediatric psychology competencies. Training experiences are sequenced to reflect gradual shifting from broad to increasingly specialized competency development across time. The primary goals of this manuscript are to (a) present our training model as a summarization of the sequence and timing of pediatric psychology specialization during graduate training (see [Tables 1 and 2](#)); (b) describe how this program sequence provides opportunities to develop competencies

within the Science and Application clusters, with linkages to associated skill domains ([Palermo et al., 2014](#)); (c) demonstrate the efficacy of this training sequence and model via program outcome data; and (d) comment on future directions for attaining and evaluating professional competence during graduate training in pediatric psychology.

Developing Competencies in Science and Application

Science

General competency in skill domains relevant to scientific research is obtained via coursework in the first 1 to 3 years of training. These domains include clinical and evaluation

Table 1
Sequence of Training Experiences to Develop Competencies in Science

Year	Specific training mechanisms	Domains
1	<ul style="list-style-type: none"> • Completing first year project on pediatric psychology topic • Assisting with dissemination of other research findings • Completing coursework in research methods • Assisting with supervised recruitment, data collection, IRB protocols, and hypothesis testing on interdisciplinary team for ongoing projects 	A, B, C, D
2	<ul style="list-style-type: none"> • Disseminating first year project in peer-reviewed journal • Assisting with dissemination of other research findings • Completing coursework on ethical conduct in research • Assisting with supervised recruitment, data collection, IRB activities, data analysis, and manuscript writing on interdisciplinary team for ongoing projects • Beginning to apply for research funding, fellowships, and grants 	A, B, C, D
3	<ul style="list-style-type: none"> • Completing Master's thesis on pediatric psychology topic • Assisting with dissemination of other research findings • Completing coursework on cultural diversity in research • Transitioning to coordinating recruitment, data collection, IRB activities, data analysis, and/or manuscript writing on interdisciplinary team for ongoing projects • Applying for research funding, fellowships, and grants 	A, B, C, D
4	<ul style="list-style-type: none"> • Disseminating Master's thesis data in peer-reviewed journal • Coordinating dissemination of other research findings • Coordinating recruitment, data collection, IRB activities, data analysis, and manuscript writing on interdisciplinary team for ongoing projects • Propose and conduct dissertation on pediatric psychology topic • Applying for research funding, fellowships, and grants 	A, B, C, D
5	<ul style="list-style-type: none"> • Completing dissertation on pediatric psychology topic • Coordinating dissemination of other research findings • Supervising recruitment, data collection, IRB activities, data analysis, and manuscript writing on interdisciplinary research team for ongoing projects • Applying for research funding, fellowships, and grants 	A, B, C, D

Note. A = Research and evaluation methodology; B = Ethical conduct of research in children; C = Interdisciplinary research; D = Dissemination and knowledge transfer ([Palermo, Janicke, et al., 2014](#)).

Table 2
Sequence of Training Experiences to Develop Competencies in Application

Year	Specific training mechanisms	Domains
1	<ul style="list-style-type: none"> • Conducting therapy and assessment with family, child, adolescent and adult clients at in-house clinic • Completing coursework in evidence-based, child/adult assessment and therapy 	A, B, C
2	<ul style="list-style-type: none"> • Completing 1 day-a-week pediatric neuropsychology externship • Conducting therapy and assessment with family, child, adolescent and adult clients at in-house clinic • Completing coursework in evidence-based child/adult therapy 	A, B, C
3	<ul style="list-style-type: none"> • Completing 1 day-a-week pediatric psychology clinical externship with focus on intervention and consultation (<i>optional</i>) • Conducting therapy and assessment with family, child, adolescent and adult clients at in-house clinic 	A, B, C, D
4	<ul style="list-style-type: none"> • Completing 2–3 day-a-week pediatric psychology clinical externship with focus on intervention and consultation • Peer supervising child/adolescent assessment and therapy clients at in-house clinic 	A, B, C, D
5	<ul style="list-style-type: none"> • Completing 2–3 day-a-week pediatric psychology clinical externship with focus on intervention and consultation • Peer supervising child/adolescent assessment and therapy clients at in-house clinic 	A, B, C, D

Note. A = Evidence-based practice; B = Assessment; C = Intervention; D = Consultation (Palermo, Janicke, et al., 2014).

methodology, legal regulations and ethical issues for conducting research with children, systematic literature reviews, ethical and diversity issues in interdisciplinary research settings, and dissemination of research findings (Palermo, Janicke, et al., 2014). Acquired knowledge from coursework is tailored and applied in the laboratory setting to ongoing pediatric psychology-specific research activities throughout the 5 years at the University of Georgia and beyond.

The Science cluster represents the earliest opportunity to develop specific pediatric psychology competencies. Beginning in the first week of graduate school, students engage in sequenced activities aimed at honing their research skills by contributing to ongoing pediatric psychology research projects. Under the guidance of their faculty mentor and senior student mentors, they become knowledgeable about ongoing investigations, acculturate to the lab environment, contribute to the conduct of these studies, grow in basic laboratory skills, aid in preparing abstracts and manuscripts, and earn authorship. In their first semester, with the support of their mentor and lab members, first-year students take lead roles in preparing independent research projects and publish these studies

during the second year. The process of completing the “first year project” involves demonstrating the ability to conduct literature searches, develop and test hypotheses, prepare research findings for publication, and interface with co-authors from a variety of disciplines (e.g., medicine, pharmacy; Palermo, Janicke, et al., 2014). The first year project is completed with greater supervision, as Science cluster competencies are still in development. As students progress into the second-third year of graduate school (when the Master’s thesis is completed), and the fourth–fifth year (when the dissertation is completed), greater independence and competence is expected in completing these research tasks.

The expectation is to publish thesis and dissertation data and multiple additional manuscripts to accumulate greater research expertise in pediatric psychology and scientific competency. As evidence of demonstrated competency in the dissemination and knowledge transfer domain, 100% (4/4) of students in the past 5 years published data in peer-reviewed journals during graduate school. Additionally, 100% (4/4) continued to publish empirical research after completing graduate training. In the past 5 years, students have obtained an average of

10.25 publications (includes peer-reviewed manuscripts and invited chapters), suggesting that the program provides students with many opportunities to develop scientific competency during graduate school.

Pediatric psychology trainees at the University of Georgia demonstrate an understanding of the vital role of research funding and writing proposals for grants and other internal and external funding sources (e.g., university, foundation, or federal resources). Grant writing competencies are developed via departmental courses, conference workshops, and practice within the laboratory. For individuals fewer than 5 years postgraduation, 100% (4/4) received research funding in the form of grants, fellowships, or awards during graduate school ($M = \$78,747/\text{student}$). These data suggest that the program emphasizes the importance of research funding in pediatric psychology and promotes seeking opportunities to develop competency in this domain during graduate school.

The progression in the science cluster is marked by increasing specialization in pediatric psychology and independence in designing studies, disseminating results, and obtaining funding to support continued interdisciplinary research (see Table 1). As evidence of Science competency, 100% (4/4) of individuals completed or are completing a postdoctoral fellowship and 100% (2/2) obtained an academic position at a university pediatric medical center as their first job, which is a typical first job placement for graduates of our program.

Application

Early graduate training involves demonstrating knowledge within the Application cluster via coursework in the domains of evidence-based practice, assessment, and intervention (Palermo, Janicke, et al., 2014) for children and adults. Knowledge and skills covered in courses are applied by working directly with clients at our supervision-intensive, in-house, community psychology clinic. Students begin seeing clients in the first year of graduate school to develop competencies in conducting biopsychosocial intake interviews, forming case conceptualizations, selecting evidence-based treatments, and providing assessments and interventions to a diverse clientele of adults, families, children, and adolescents. As the junior members of ver-

tical teams, first-year students observe therapy cases during the majority of their first semester and pick-up their first client at the end of the first or beginning of the second semester. Pediatric psychology students spend approximately three years developing Application competencies at the in-house clinic, with one year devoted to an adult clinical team and two years devoted to child clinical teams. Experience obtained on child clinical teams develops core competencies in providing evidence-based, child-focused assessments and treatments that translate to specialized pediatric psychology training opportunities.

Pediatric psychology specialization in assessment begins in the summer before their second year at a pediatric neuropsychology externship at a children's hospital. This externship develops competence in test selection, administration, and report writing for cases involving pediatric patients with various medical conditions (e.g., cerebral palsy, traumatic brain injury). Given the high degree of structure in conducting neuropsychological assessments, this externship is viewed as a transitional training experience that dually prepares students for working in outpatient and inpatient pediatric medical settings, in which greater autonomy will be expected. The externship involves two days a week during the summer and one day per week during the fall with the option to continue through the spring. Concurrently, students in their second year continue seeing clients on a clinical team in the training program's in-house clinic.

In the third year, students have the option to complete an advanced, one day-a-week, pediatric psychology externship while completing the final year of training at the in-house clinic. By the fourth and fifth years of graduate school, students complete 100% of applied training at pediatric psychology externship sites (e.g., inpatient and outpatient transplant, hematology-oncology, rehabilitation, pain management), which includes 2 to 3 full days of conducting clinical assessment, intervention, and consultation with diverse patients and families. Externship experiences further develop competence in assessment and intervention skills (e.g., conducting brief outpatient/inpatient assessments of presenting problems with respect to medical diagnoses, selecting appropriate interventions or referrals), in addition to providing consulta-

tion-liaison services as requested by interdisciplinary medical personnel (Palermo, Janicke, et al., 2014; see Table 2 for more details on the sequence of Application experiences). A unique aspect of the training model is that our research sites and clinical externships often overlap, providing comprehensive learning experiences about the mutually informative relationship between Science and Application in pediatric psychology.

In the past 5 years, 100% (4/4) of individuals completed clinical training in assessment, intervention, and consultation at pediatric psychology externships during graduate school. As evidence of the efficacy of these training experiences, 100% (4/4) matched at and completed accredited internships at sites providing pediatric psychology training. Of graduates eligible at this stage in their career, 100% (2/2) demonstrated professional competency in the Application cluster domains by obtaining licensure status. Under the current training model, students completed an average of 5.75 pediatric externship placements for clinical training, which resulted in an average of 40.5 months of pediatric psychology clinical training during graduate school. The high rates of pediatric psychology clinical training may be attributed in part to our laboratory's faculty and students looking for opportunities to combine Application and Science by conducting research at the externships sites. This approach has proven to be appealing to externship supervisors, as evidenced by the supervisors having become our primary research collaborators in the areas of transplantation, neuropsychology, and oncology. Our lab's research collaborations in these pediatric specialties, with one extending for more than 12 years, initially started solely as pediatric clinical externship opportunities. Now, Science and Application training are highly interwoven at three of our most utilized externship sites. We continue to look for new opportunities develop combined pediatric Science and Application training relationships.

Evaluation of Competencies

At the end of each semester, summative evaluations are provided for each student in specific areas of the Science and Application competency clusters. A standard, Likert-scale rating form (1 = *very poor* to 5 = *excellent*) is used to

assess competencies within the Science cluster, including research methodology, statistics, ethics, collection of data, written and oral communication, and diversity. A similar process is used to assess competency attainment in the Application cluster, with the same Likert-scale ratings applied to evaluate competency in clinical assessment skills, treatment structure and implementation, ethics, report-writing and note-keeping, responsiveness to supervision, and issues of human diversity. For both clusters, there are open-ended questions for assessing strengths, weaknesses, and areas for improving aspects of competency domains. Ratings of Science competencies are completed by the major professor and Application competencies by the clinical supervisor.

There are strengths and weaknesses to this evaluation process. The rating anchors and domains are broad enough to be tailored to the student's developmental level and applied to the range of opportunities and experiences completed within a given semester. However, this process lacks evaluation of validity and empirical support for reliably measuring true attainment of competency. The systematic evaluation process remains an area of quality improvement for graduate training.

Final Thoughts

In response to the recently defined competencies (Palermo, Janicke, et al., 2014), there has been discussion about the timing of specialization in pediatric psychology, particularly in graduate training, to best facilitate trainee development (Cohen, 2014; Palermo, Mullins, et al., 2014; Steele et al., 2014). Our training model at the University of Georgia provides one answer for how and when Science and Application competencies may be attained within the context of a "general" clinical psychology graduate program. This is accomplished by gradually shifting toward greater specialization in pediatric psychology following the development of general, broad-based clinical psychology competencies.

We believe that our training model successfully addresses issues of sequencing training priorities and opportunities by providing students with general knowledge early in training that translates into completing specialized experiences in pediatric psychology later in training.

The field is based on foundational principles and competencies that are applicable across specializations in clinical psychology. A strong “pediatric psychology” identity is instilled in students via specialized experiences that provide clear opportunities to develop and demonstrate Science and Application competence in a variety of pediatric settings. Our students have provided highly regarded clinical service and excelled in conducting research in pediatric settings. Additionally, our program is unique in that there is a high degree of overlap between research projects and clinical training experiences, providing complementary opportunities for developing Science and Application competencies, often in the same setting. The success of this approach is evidenced by student outcomes in Science and Application competencies over the past 5 years. The high numbers of publications, student research funding, and pediatric clinical training experiences during graduate school suggests that the current training model yields outstanding outcomes for Science and Application cluster competencies (Palermo, Janicke, et al., 2014).

Our training model’s sequencing of training experiences and timing of specialization may have applicability to similar doctoral programs including students with goals of becoming pediatric psychologists. We encourage greater communication among doctoral training programs to facilitate further discussion on best practices for developing pediatric psychology competencies during graduate school. Communication among programs could be facilitated via the establishment of a training-specific special interest group, conference symposiums, or

empirical study of graduate programs that consistently produce pediatric psychologists. Although our current program sequence appears to facilitate competency development and acquisition as evidenced by the outcome data, there remains a need for measures and indices of competency attainment that possess a level of detail and precision that our current assessment system does not offer. Future research is needed to develop and validate such instruments for use in pediatric psychology training programs.

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