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# Recruitment in Child Psychiatry: The Impact of a Voluntary Fellowship Program on Medical Students Career Decisions

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Recruitment in Child Psychiatry:  
The Impact of a Voluntary Fellowship Program on Medical Students' Career Decisions

A Thesis Submitted to the  
Yale University School of Medicine  
in Partial Fulfillment of the Requirements for the  
Degree of Doctor of Medicine

Eric R. Arzubi

2008

## ABSTRACT

This study was designed to measure interest in child and adolescent psychiatry among medical students and to assess the impact of an innovative medical student fellowship program on that interest.

Students (N = 916) from ten medical schools completed an online survey designed to measure their interest in child and adolescent psychiatry and their understanding of the subspecialty. Students (N = 123) participating in a voluntary child and adolescent psychiatry fellowship offered at six of the ten medical schools completed an online survey designed to evaluate the quality of their experience and to measure the impact of the fellowship program on their understanding of the subspecialty and on their interest in becoming child and adolescent psychiatrists.

There exists relatively low interest in pursuing a career in child and adolescent psychiatry among medical students in general, with 79% of fellowship non-participants stating that they have ruled out a career in the subspecialty. Medical students also indicated they had limited knowledge of the field, with 61% of non-fellows stating that they had little or no understanding of child and adolescent psychiatry. Conversely, medical students who did report a strong understanding of child and adolescent psychiatry were much more likely to show interest in pursuing a career in the field. The fellowship was rated highly by participating medical students, with 83% of participants rating the experience “Good” or “Excellent”; the fellowship appeared to make its biggest impact on students’ understanding of the subspecialty, with 53% indicating that their understanding was greatly increased. The fellowship program succeeded in strengthening a strong initial interest in a child and adolescent psychiatry career among medical students. 62% of participants said they joined the fellowship program in part because

they were already considering a career in the subspecialty, and 64% of students continued to express that interest after taking part in fellowship activities. 22% of participants stated the fellowship program greatly increased their desire to become child and adolescent psychiatrists.

Given the high prevalence of pediatric mental disorders, a closer look at the state of child and adolescent psychiatry education and recruitment is warranted. Psychiatric disorders are among the most frequently diagnosed medical conditions in children and adolescents, and there is a shortage of clinicians who are equipped to treat them. Only 2% of medical students indicated a very strong understanding of child and adolescent psychiatry and 1% of medical students expressed a maximal interest in pursuing a career in the subspecialty. Medical education must prepare primary care physicians, many of whom will encounter a significant number of pediatric patients with mental illness, to properly assess and treat them. Moreover, leaders in child and adolescent psychiatry must continue improving existing recruitment initiatives. Until medical school curricula include more teaching of child development and psychopathology, the fellowship can prove to be an effective vehicle through which to teach medical students about child and adolescent psychiatry. The fellowship is particularly effective as the program provides medical students with opportunities to work directly with children and their families in clinical settings and in schools. That exposure, coupled with effective mentoring relationships, has turned the fellowship into an effective recruitment tool for child and adolescent psychiatry.

## **ACKNOWLEDGEMENTS**

First and foremost, I would like to thank my dear mentors, Dr. James Leckman and Dr. Andres Martin. They were instrumental in helping me craft a vision for my future in medicine. Also, they opened countless doors and presented me with wonderful opportunities in child psychiatry, one of which was the chance to evaluate the Klingenstein Third Generation Foundation (KTGF) Medical Student Fellowship in child and adolescent psychiatry, the foundation of this thesis.

Thank you also to KTGF and to the American Academy of Child and Adolescent Psychiatry (AACAP) for supporting my efforts in the evaluation of the KTGF Fellowship and the investigation of medical student interest in this critical medical subspecialty.

Finally, thank you to Kaplan, Inc. for donating subscriptions to widely used online test prep materials to help students study for the United States Medical Licensing Examinations. These subscriptions were used to help increase the response rate among medical students filling out our survey instruments.

## TABLE OF CONTENTS

Introduction	6
Methods	27
Results	30
Discussion	42
References	48
Appendix	52

## INTRODUCTION

There is a critical mismatch between the prevalence of psychiatric disorders in U.S. children and the number of clinicians who are equipped to care for them. Psychiatric disorders rank among the most common medical conditions affecting children and adolescents (1); the median prevalence of functionally impairing pediatric mental illness is 12% and the World Health Organization estimates that 10% to 20% of all children experience one or more mental disorders (for brevity, the term *children* is used to refer to children and adolescents).(2) Other estimated prevalence rates of functionally impairing mental disorders among children have approached 20%.(3)

There are too few child psychiatrists practicing in the U.S. and the shortage has been widely reported for several decades. As early as 1964, the American Psychiatric Association recommended an increase in the number of available child psychiatry training programs in a report called “Career Training in Child Psychiatry”.(4) More recent studies continue to report an existing shortage of child psychiatrists. The Graduate Medical Educational National Advisory Committee Report estimated that about 14.38 child psychiatrists per 100,000 children are required to provide adequate care, a figure that was met or exceeded by only six states in 2001: Connecticut, Hawaii, Maryland, Massachusetts, New York, and Rhode Island.(5) It was only a slight improvement compared to 1990 because the two states joining the list, Hawaii and Rhode Island, are home to a relatively small number of children compared to other states.(5) Other studies reveal that the shortage is expected to continue well into the future. According to an analysis commissioned by the American Academy of Child and Adolescent Psychiatry’s (AACAP) Task Force on Workforce Needs, 12,624 child psychiatrists will be needed by

2020 to meet the expected demand for services.(3) Unless dramatic changes are made in funding and recruitment, the true number of child psychiatrists will likely fall short by one-third of the optimal number, reaching only 8,312. While the general shortage of child psychiatrists is certainly problematic, a poor distribution of the country's existing clinicians compounds the problem in many communities.(5) The problem for children from poor communities is particularly severe; they are more likely than their wealthier peers to develop mental illness, while mental health practitioners are less likely to extend services to their neighborhoods.(5) By any measure, the U.S. shortage of child psychiatrists is a serious problem that prompted the AACAP in 2001 to declare that recruitment into the subspecialty would be the organization's top priority through 2011.(3)

Table A summarizes the factors leading to the child psychiatrist shortage in the U.S. and the recommendations to address the problem as outlined by AACAP's Task Force on Workforce Needs. The recommendations focus on faculty mentoring of medical students and residents, collaborating with other primary care specialties, improving education undergraduate medical education, and boosting research efforts in child psychiatry.

Boosting the number of practicing child psychiatrists is a long-term goal. In the meantime, the shortage of mental health services can be addressed in part by improving the training of primary care physicians who are asked to assess and treat so many of the children with behavioral disorders presenting to their practices.(1, 3) Given the existing shortage of child psychiatrists, children suffering from mental illness very often present



to the offices of general practitioners and pediatricians.(1) One study found that 38% of adolescents

**Table A: Analysis and recommendations from AACAP's Task Force on Workforce Needs(3, 6)**

Factors affecting medical student decisions:	<ul style="list-style-type: none"> <li>• Lack of exposure to child and adolescent psychiatry during medical school education.</li> <li>• Increasing levels of educational debt burden.</li> <li>• Long years of residency training and relatively smaller income potential in general psychiatry as well as in child and adolescent psychiatry.</li> </ul>
Factors affecting recruitment of residents and faculty:	<ul style="list-style-type: none"> <li>• Inadequate support in academic institutions.</li> <li>• Decreased Graduate Medical Education (GME) funding.</li> <li>• Decreased clinical revenues in managed care environment.</li> <li>• Devalued image of the profession.</li> </ul>
Recommendations:	<ul style="list-style-type: none"> <li>• Each child and adolescent psychiatry program should offer mentoring both to medical students and residents.</li> <li>• Child and adolescent psychiatrists should form liaisons with national organizations such as the American Medical Association and the American Academy of Pediatrics.</li> <li>• Medical students and general psychiatry residents should be exposed to child and adolescent psychiatry early on in their education.</li> <li>• To enhance professional exposure of child and adolescent psychiatrists as specialists, they should be trained to form relationships with local and national news agencies.</li> <li>• Undergraduate and medical students should be asked to get involved in paid summer research programs in child and adolescent psychiatry.</li> <li>• The creation of new children's mental health programs and funding for child and adolescent psychiatry research training should be sought.</li> </ul>

treated by a general practice in London had suffered from a psychiatric disorder in the previous year.(7) In the U.S., pediatricians are also often the first point of referral for child psychiatry cases. A 1996 study of Chicago pediatric practices revealed that 21% of patients aged 2 to 5 had a mental disorder.(8) Although there has been a dramatic increase in the number of effective treatments for children with mental illness over the last 30 years, the number of clinicians equipped to implement them has not kept apace.(9) Several studies have revealed that general practitioners and pediatricians find it difficult to diagnose and manage mental health problems. In an Australian survey, pediatricians listed nine psychosocial disorders among the ten most difficult conditions to manage, including conduct disorder, eating disorders, autism, and attention-deficit/hyperactivity

disorder.(10) U.S.-based pediatricians revealed similar attitudes, naming anticipatory guidance, mental health, and attention-deficit/hyperactivity disorder as important areas of research for their practices.(11)

The growing prevalence of mental illness among children and the broadening range of clinicians called upon to diagnose and treat psychopathology demand that medical educators give the child psychiatry curriculum greater importance.(1) Currently, the amount of teaching time dedicated to understanding normal child development or learning to assess families and children falls far short of that required to reflect the size of the public health burden resulting from pediatric mental illness.(1) Moreover, there are no minimum teaching requirements for child psychiatry in the medical school curriculum.(12) The Liaison Committee on Medical Education of the American Medical Association outlines broad educational objectives and general requirements, but falls short of outlining specific or subject-based learning objectives.(12) Child psychiatry departments from different medical schools must collaborate to develop standards and learning objectives so that medical students graduate with the requisite skills to identify, assess, and treat common childhood psychiatric disorders that are often encountered in primary care settings.(1)

The evolving history of this problem demands a three-pronged approach to expand mental health services for children and adolescents (see Table 2). First, AACAP and child psychiatry faculty must sustain their efforts to boost recruitment of medical students and residents into the subspecialty. Secondly, medical educators must place a greater emphasis on providing mental health training to trainees who are likely to encounter children in primary care settings such as pediatricians' offices and family

medical practices. Increased research activity, the third leg in the approach to reversing the shortage of mental health services for children, is required to support recruitment and education efforts.

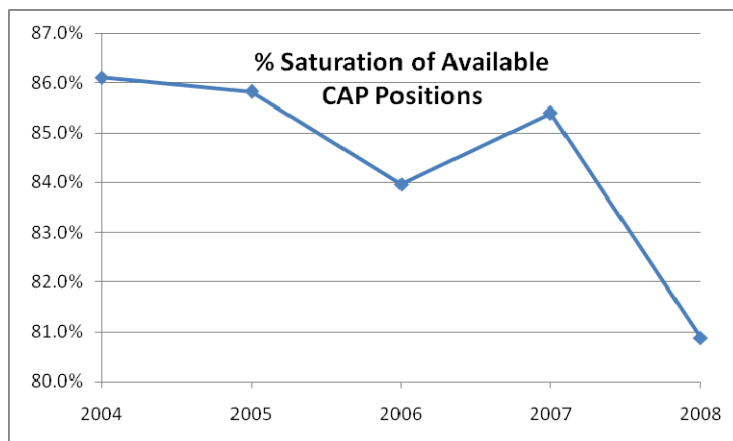
**Table B: Summary of the problem and proposed strategies.**

<p><b>Problem:</b> The number of evidence-based treatments in child and adolescent psychiatry has grown over the last 20 years, but there is a shortage of physicians who are equipped to treat children struggling with mental illness.</p> <p><b>Strategy:</b> A three-pronged approach that aims to increase the number of child and adolescent psychiatrists, while equipping more primary care physicians, including pediatricians and family practice doctors, to use evidence-based assessment and treatment options to support children with mental illness.</p> <ol style="list-style-type: none"> <li>1. Increase the number of child and adolescent psychiatrists.             <ol style="list-style-type: none"> <li>a. Expand the number of child and adolescent fellowship positions.</li> <li>b. Implement effective recruitment initiatives to fill the positions by targeting the following trainee populations:                 <ol style="list-style-type: none"> <li>i. Medical students</li> <li>ii. Psychiatry residents</li> </ol> </li> </ol> </li> <li>2. Equip primary care physicians with the tools to assess and treat children struggling with mental illness.             <ol style="list-style-type: none"> <li>a. Expand the medical school curriculum to include more didactics on child development and psychopathology.</li> <li>b. Outline minimum educational goals and objectives across medical schools that deliver instruction on child development and psychopathology.</li> <li>c. Introduce innovative programs to teach interested medical students more about child and adolescent psychiatry.                 <ol style="list-style-type: none"> <li>i. Didactics</li> <li>ii. Clinical exposure to children and families</li> </ol> </li> </ol> </li> <li>3. Encourage research activity focusing on the assessment and treatment of children with mental illness.             <ol style="list-style-type: none"> <li>a. Foster research specific to child and adolescent psychiatry</li> <li>b. Develop research initiatives that depend on collaboration with other specialties, including pediatrics and neurology.</li> </ol> </li> </ol>
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Historically, child and adolescent psychiatrists have held clinical and teaching appointments at medical schools, often lacking the clout of physicians from other specialties who generate more research money and hold senior administrative

positions.(1) In fact, child and adolescent psychiatrists often work for the Department of Psychiatry or Pediatrics, making it even more difficult for them to promote the subspecialty's priorities within their medical schools. In order to boost the visibility of child and adolescent psychiatry, faculty members must look to generate more research activity. While expanded research will continue to broaden treatment options for children with mental illness, it will also serve to better position child and adolescent psychiatrists for promotions at research-oriented medical schools.(1) With more child and adolescent psychiatrists in senior administrative positions, lobbying for more teaching time within the medical school curriculum will yield more results. Since the number of child psychiatrists at individual medical schools is generally small, collaboration across different institutions is key boosting research activity and outlining common educational objectives in the subspecialty.(1)

### Medical Student Attitudes Towards Child and Adolescent Psychiatry



**Figure 1: Number of new child psychiatry fellows divided by the number of total available fellowship positions.**

If recruitment initiatives are to be successful, it is important first to examine the reasons for which medical students choose to pursue or reject a career in child psychiatry. Research has consistently found that

interest in psychiatry among medical students is relatively low.(13) In fact, the latest data from the National Residency Match Program reveals that the percentage of graduates

from U.S. allopathic medical schools matching in a psychiatry residency program has declined to 4% in 2008 from 5% in 2004. The absolute number of graduates from U.S. medical schools matching in psychiatry has declined by 7%, to 595 in 2008, down from 641 in 2004.(14) The trend is concerning since most child psychiatry trainees, or fellows, are recruited from the pool of residents training in general psychiatry. For now, the numbers for child psychiatry are slightly more promising. The number of residents filling child psychiatry fellowship positions grew by 16%, to 258 in 2008, from 223 in 2004; however, the number of available fellowship spots outpaced that growth, resulting in matches for 81% of available positions in 2008, compared to 86% in 2004 (see Figure 1).

The AACAP Task Force on Workforce Needs already outlined a number of obstacles to increasing the number of practicing child psychiatrists (Table 1).(3) Subsequent research has supported those findings and uncovered other reasons for deciding against a career in child psychiatry, including concerns about scientific rigor, therapeutic efficacy, and enjoyment of the specialty.(13) Additionally, medical students believe that psychiatry will require them to use only a portion of the extensive scientific and clinical knowledge acquired during their undergraduate medical years.(13) There are only a few studies examining the reasons for which medical students choose or reject a career in child and adolescent psychiatry. Additionally, little is known about which interventions are most effective in improving medical student perceptions of child and adolescent psychiatry.

In one study, the faculty at the Drexel University College of Medicine examined changes in medical student attitudes towards general psychiatry and child psychiatry

before and after a six-week psychiatry clerkship during the 2002/2003 school year.(13) About 55% of students spent up to three weeks in child psychiatry inpatient units and all students received a minimum of two formal child psychiatry lectures. Pre-clerkship, the most positive aspects of child psychiatry named by students included the opportunity to help children and the perception that children were more responsive to treatments than adults. The two most negative aspects of child psychiatry identified at the outset of the clerkship included a perception that the work was emotionally very stressful and that there appeared to be a lack of familial or societal support for children. While the positive elements of child psychiatry remained largely unchanged at the end of the clerkship, the negative attitudes did change. Significantly fewer students ultimately felt that the work of a child psychiatrist was too emotionally stressful, while a significantly larger number of students perceived a lack of familial or societal support for children. The number of students planning to specialize in psychiatry did not change over the course of the six-week clerkship.(13)

In 1994, the faculty at the Medical College of Wisconsin described a similar study in which they polled 24 students before and after a child psychiatry sub-rotation. Fifty percent of students revealed that their attitudes towards child psychiatry were positively affected, while no one felt their perception of the subspecialty changed for the worse.(15) There were four common characteristics among students identifying a positive change in attitudes: (1) college major of nonbiology or psychology, (2) female, (3) oldest sibling, (4) medical career focus on interpersonal relations (versus research or teaching). Moreover, results showed that students with an interest in primary care specialties were more likely to consider a fourth year child psychiatry elective compared to students

interested in specialties with less patient contact like pathology and radiology. 44% of students felt the child psychiatry rotation was important to being a good doctor.

The Wisconsin results were not dissimilar to findings described by the faculty from the Loma Linda University School of Medicine in 1988. Based on data from the Association of American Medical Colleges (AAMC) Graduation Questionnaire (GQ), medical students indicating an interest in child psychiatry were more likely to have completed a pediatric elective or clerkship, be female, and have an inclination towards primary care work.(16)

#### *The Role of Mentorship in Recruitment and Education*

Clinical experiences certainly influence medical students' career choices(17); however, mentorship by faculty is critical to help students process the wide range of reactions to clinical encounters experienced during medical training. In fact, mentorship is considered important to the general training of health care professionals and to advancing clinical care, research, and education.(18) The first systematic review of mentoring in academic medicine, published in the Journal of the American Medical Association in 2006, revealed that mentorship is an important influence on personal development, career guidance, career choice, and productivity.(18) It is therefore no surprise that AACAP's Task Force on Workforce Needs listed the mentoring of medical students and residents first on its list of recommendations to address the critical shortage of child psychiatrists. (6)

Although mentoring has long been considered critical to the career development of medical professionals, the research on mentorship is limited, making it difficult to draw conclusions regarding the effect size of mentoring on any aspect of academic or

professional development.(18) Nevertheless, mentors and mentees continue to meet with one another, forging relationships that anecdotal evidence reveal to be rewarding for both parties.(19) The 2006 review of mentoring concluded that more research was necessary and encouraged randomized trials and the evaluation of formal, multi-site mentoring programs.

Faculty members from the Department of Medicine at the University of California, San Francisco (UCSF) published the results in 2005 of a focus group study designed to elucidate the functions of mentors, characterize successful mentoring relationships, and uncover barriers to mentoring for medical students.(19) The study, based on discussions with senior medical students at UCSF, revealed five themes that were critical to mentoring relationships: (1) support from a mentor and trust that the mentor will always focus on the student's best interest; (2) a personal connection that includes friendship and personalized guidance; (3) open-mindedness on the part of mentors when discussing a student's career plans and help crafting a vision; (4) student empowerment and initiative to seek out an appropriate mentor and nurture that relationship; and (5) a challenge to nurturing mentoring relationships may be presented by the structure of medical education.(19) A summary of the themes and recommendations from the UCSF study is provided in table C.



**Table C: Important themes in mentorship and recommendations from medical students on how to improve mentoring relationships.(19)**

Themes	<ul style="list-style-type: none"> <li>✓ Support and trust <ul style="list-style-type: none"> <li>○ Moral support</li> <li>○ Sincerity</li> </ul> </li> <li>✓ Personal Connection <ul style="list-style-type: none"> <li>○ Friendship</li> <li>○ Personalized guidance</li> </ul> </li> <li>✓ Career development <ul style="list-style-type: none"> <li>○ Open-mindedness</li> <li>○ Achieving a vision</li> </ul> </li> <li>✓ Student empowerment <ul style="list-style-type: none"> <li>○ Student initiative</li> <li>○ Student education</li> </ul> </li> <li>✓ Structure of medical school <ul style="list-style-type: none"> <li>○ Disconnect between preclinical and clinical years</li> <li>○ Inadequate access to faculty</li> <li>○ Conflict of interest</li> </ul> </li> </ul>
Medical student recommendations for improving mentoring.	<ul style="list-style-type: none"> <li>✓ Develop system that accommodates students' changing needs throughout medical school.</li> <li>✓ Encourage students to pursue mentors.</li> <li>✓ Expand potential pool of mentors.</li> <li>✓ Educate faculty how to mentor.</li> <li>✓ Enhance value of mentoring for faculty.</li> </ul>

If implemented properly, an effective mentoring program could be particularly useful to boost recruitment and interest in underrepresented medical specialties.(20) For example, mentoring was a major component of an intervention in Canada designed to boost recruitment in family medicine.

The number of medical students choosing a career in family medicine in Canada has been deteriorating over the last ten years.(21) Family medicine in Canada appears to be facing many of the challenges encountered by child psychiatry in the U.S.; Canadian students opt out of a career in family medicine because they show interest in research, look for more prestigious specialties, encounter negative attitudes towards the field in educational and clinical settings, and hope to pursue a higher-paying specialties.(21) In an attempt to stimulate interest in the specialty at the Faculty of Medicine at the University of Toronto in Ontario, Canada, a student-run interest group in family medicine

was created in 2003 with a focus on three areas: (1) informing medical students about family medicine; (2) coordinating a mentorship program between family practice doctors and medical students; and (3) advocating increased family medicine exposure in the medical school curriculum. An evaluation of the interest group and its activities revealed that it was successful in dispelling many of the myths surrounding family medicine through education and more clinical exposure.(21) Furthermore, the interest group created a community of students with similar interests, making them feel supported in pursuing a career associated with some negative stereotypes.(21) Ultimately, the family medicine interest group served to boost the credibility of the medical specialty at the University of Toronto and it sustained student interest by fostering a community of students with overlapping interests.(21) Additionally, the interest group provided positive role models through its mentorship program.(21)

In child psychiatry, another underrepresented medical specialty, organizers of U.S. and international conferences have recently introduced mentoring programs as part of regularly scheduled activities.(20, 22) Medical students, psychiatry residents and child psychiatry fellows are matched with mentors who have volunteered to lead small group meetings that have been included in the conference schedule. These short-term mentoring programs were implemented during AACAP's annual meetings in 2006 and 2007, the Congress of the International Association of Child and Adolescent Psychiatry and Allied Professions (IACAPAP) in 2006 and 2008, and the International Congress of the European Society for Child and Adolescent Psychiatry (ESCAP) in 2007. The conference-based mentoring programs led to increased interest in child psychiatry and a greater feeling of connectedness to mentors and to the subspecialty among trainees.(20)

Additionally, the experience increased the likelihood that participants, including mentors and trainees, would continue to foster mentoring relationships upon return to their respective academic institutions.(22)

In order to continue monitoring the quality and effectiveness of the conference-based mentoring programs, organizers consistently collected information from participants using survey instruments.(20, 22) The development of the survey began in 2006 in preparation for the 17<sup>th</sup> Congress of IACAPAP and was conducted using a paper-based format. In preparation for this study, Eric Arzubi further refined the survey in 2007 and converted it to a web-based instrument which was used to collect data to evaluate subsequent conference-based mentoring programs in 2007 and 2008. (see Table D) The table refers also refers to two long-term mentoring programs, the Donald J. Cohen (DJC) Medical Student Fellowship and the Klingenstein Third Generation Foundation (KTGF) Medical Student Fellowship, both of which will be discussed in the next section.

#### *An Intervention to Generate More Interest in Child Psychiatry*

About six years ago, a program was developed at the Yale School of Medicine to improve the understanding of child psychiatry among medical students and to pique their interest in the subspecialty. In 2002, the KTGF and the John and Patricia Klingenstein Fund established the DJC Medical Student Fellowship program to honor Dr. Cohen, who was a graduate of the Yale Medical School and who served as the Director of the Yale Child Study Center (YCSC) from 1983 until his passing in 2001.

**Table D: Surge in mentoring activity in child psychiatry and the evolution of a tool to evaluate its impact.**

Year	Use	Survey Format
2002 to 2006	Donald J. Cohen Fellowship at the Yale Child Study Center, New Haven, CT	Paper
2006	Mentoring Program at the 17 <sup>th</sup> Congress of the International Association of Child and Adolescent Psychiatry and Allied Professions (IACAPAP), Melbourne, Australia	Paper
2006	Mentoring Program at the 53 <sup>rd</sup> Annual Meeting of the American Academy of Child and Adolescent Psychiatry (AACAP), San Diego, CA	Paper
2007 to Present	Klingenstein Third Generation Foundation Medical Student Fellowship, Multi-Site Program	Online
2007	Mentoring Program at the 13 <sup>th</sup> International Congress of the European Society for Child and Adolescent Psychiatry (ESCAP), Florence, Italy	Online
2007	Mentoring Program at the 54 <sup>th</sup> Annual Meeting of AACAP, Boston, MA	Online
2008	Mentoring Program at the 18 <sup>th</sup> Congress of IACAPAP, Istanbul, Turkey	Online

The KTGF contacted the Director of Research at the YCSC, Dr. James Leckman, and asked how funding might be used to support medical students at Yale to increase their interest in Child Psychiatry. Dr. Leckman, who was acutely aware of the shortage of physician-scientists with a background in child and adolescent psychiatry pursuing independent research careers, saw this as an opportunity to increase the number of students entering the field. At the time, Dr. Leckman was mentoring a medical student, Michael H. Bloch, who was completing his thesis; Yale Medical School requires that students complete a research project in order to graduate. In the context of their ongoing meetings, the initial conceptualization of the DJC Medical Student Fellowship Program took shape. Key elements included: (1) a voluntary program for medical students to directly participate in the care of children and families; (2) direct mentorship, linking a child mental health professional with a medical student, ideally in the first two years of

training; (3) a monthly evening seminar in which the medical students would discuss their experiences over a free meal; and (4) student leadership, such that medical students with a clear interest in child and adolescent psychiatry would organize and lead the monthly seminars, spearhead the recruitment effort and monitor the success of the program. The KTGF funds were used to purchase beepers, the Lewis textbook on Child and Adolescent Psychiatry, and to fund the monthly seminars.

The DJC Fellowship was designed to encourage medical students to become familiar with the special challenges associated with the care of children and adolescents afflicted by mental, behavioral and developmental disorders.(23) Although this program is called a “fellowship”, any interested medical student can join and there is no financial incentive for participating. The DJC Fellowship can in some ways be regarded as a child psychiatry interest group for medical students; Fellowship activities center around student-faculty mentoring relationships and monthly group meetings to discuss interesting cases encountered by students. The first cohort of Fellows was made up of 15 students and Fellowship activities began in the second half of the school year, spanning from January 2003 to May 2003. Dr. Bloch took the lead in recruiting his fellow students while Dr. Leckman encouraged his peers to become mentors and organized the introductory seminars in which interested students heard from potential mentors about their ongoing efforts on behalf of children, ranging from clinical services to research programs. Medical students were paired with faculty mentors from the Yale Child Study Center who had volunteered their time to this endeavor. Mentors, students and the Fellowship’s faculty directors gathered monthly at the seminars when students gave case presentations describing clinical encounters with child psychiatry

**Table E: Summary of DJC Fellowship Evaluations at the Yale Child Study Center. Ratings are based on a 10-point scale in which 10 is the highest and most favorable rating.**

<b>Academic Year</b>	<b>N</b>	<b>Theme</b>	<b>Pre-DJC</b>	<b>Post-DJC</b>
2002/2003	10	Overall Experience	-	8.3
		Clinical Experiences	-	8.7
2003/2004	22	Overall Experience	-	7.9
		Avg. Likelihood of Pursuing CAP Career	3.8	5.7
		Avg. Likelihood of Doing CAP Elective	4.2	8.1
		No. of Students Considering CAP Career	2	5
2004/2005	22	Overall Experience	-	8.7
		Avg. Likelihood of Pursuing Peds Career	6.1	7.0
		Avg. Likelihood of Pursuing CAP Career	3.4	5.2
		Avg. Likelihood of Doing CAP Elective	5.5	8.7

patients. During the last meeting of the year, students used a paper-based evaluation form to rate their experiences on a 10-point scale, with 10 as the highest possible score. Based on 10 responses, the mean rating of the overall experience was 8.3/10 and the quality of the clinical experiences was rated an 8.7/10. In the second year of the Fellowship, which lasted from September 2003 to May 2004, word-of-mouth from the prior year's participants was largely responsible for the recruitment of new Fellows.(24) As a result, the Fellows who were particularly vocal in their endorsement of the Program were asked to provide leadership in all aspects of the Fellowship, including the organization of monthly seminars and the management of the mentorship pairings. The second year, the duration of the Fellowship was expanded to last the entire school year and nearly twice as many students participated. 22 of the 29 Fellows from the second year completed the paper-based evaluations and rated the overall Fellowship experience a 7.9/10. The Fellows also indicated that they met with their mentors an

average of 10.5 times throughout the year, or an average of more than once monthly. In the comments section of the evaluations, medical students also recommended increased exposure to clinical encounters with child psychiatry patients and more didactics during the monthly seminars to support the case presentations. The evaluations also revealed that the Fellowship had made a material impact on students' interest in child psychiatry. On a 10-point scale in which 10 represents the absolute highest likelihood, the average measure of likelihood that medical students planned on pursuing a career in child psychiatry rose to 5.7/10, compared to 3.8/10 before participating in the Fellowship. Similarly, 5 medical students expressed interest in a career in child psychiatry after participating in the Fellowship, compared to 2 medical students at the beginning of the year. Before the start of the Fellowship, the average likelihood of choosing to complete an elective child psychiatry clerkship was 4.2/10, compared to 8.1/10 after students participated in the Fellowship. The Fellowship also seemed to influence research interests. During the 12 years before the beginning of the Cohen Fellowship, 17 medical students, or an average of 1.4 per year, chose to engage in summer research projects at the Yale Child Study Center. During the summer of 2004, four medical students elected to pursue research projects at the Yale Child Study Center, some of which eventually resulted in a Doctor of Medicine research thesis.<sup>(24)</sup> Using similar measures, the third year of the Fellowship at the Yale Child Study Center was considered a success.<sup>(24)</sup> 22 of the 26 Fellows completed paper-based evaluations and gave the Fellowship experience high marks. The mean rating of the overall experience was 8.7/10 out of 10 and one student included the following remark: "The Cohen Fellowship is well-run, well-organized and probably the most professional of the extracurricular activities available to

first-year students at Yale.” Again, the Fellowship experience made a positive impact on student attitudes towards child-related medical subspecialties. The mean likelihood that a participating student planned to pursue a career in pediatrics increased to 7.0/10 after the Fellowship experience, compared to 6.1/10 at the beginning of the year. Similarly, the mean likelihood of Fellows pursuing a career in child psychiatry rose to 5.2/10 from 3.4/10 and the mean likelihood of Fellows participating in child psychiatry electives grew to 8.7/10 compared to 5.5/10 at the beginning of the 2004/2005 school year.

Additionally, student leaders continued to provide much of the energy and leadership behind the Fellowship by generating enthusiasm for the Program among the student body and by organizing the monthly seminars. Interest in child psychiatry research among Fellows remained strong throughout the year, with Paul Kalanithi, a third year student, and Shobi Ahmed, a fourth year student, publishing papers in highly esteemed medical journals. Table F provides a compilation of several papers published by Yale’s Cohen Fellows from 2005 to 2007.

The growing popularity of the DJC Fellowship among student and faculty at Yale led to two important events that helped to extend the impact of the Program. First, the KTGF acknowledged the success of the Cohen Fellowship model by sending a request for proposals (RFP) in 2005 to over 20 child psychiatry departments from U.S. allopathic medical schools. These schools were selected because they had shown an interest by attending a national meeting in the summer of 2005 in which Dr. Leckman, Dr. Bloch, another Yale medical student, Amy Meadows, representatives of AACAP and the Board of the KTGF presented the initial results of the DJC Fellowship. The RFP invited child



**Ahmed S**, Tie it and Trust. *Journal of the American Medical Association* 2005; 294(15): 1873-1874.

**Bloch MH**, Leckman JF, Zhu H, Peterson BS. Caudate volumes in childhood predict symptom severity in adults with Tourette syndrome. *Neurology*. 2005 Oct 25;65(8):1253-8.

**Bloch MH**, Peterson BS, Scahill L, Otko J, Katsoyich L, Zhang H, Leckman JF. Adulthood outcome of tic and obsessive-compulsive symptom severity in children with Tourette syndrome. *Arch Pediatr Adolesc Med*. 2006 Jan;160(1):65-9.

**Bloch MH**, Sukhodolsky DG, Leckman JF, Schultz RT. Fine-motor skill deficits in childhood predict adulthood tic severity and global psychosocial functioning in Tourette's syndrome. *J Child Psychol Psychiatry*. 2006 Jun;47(6):551-9.

**Caminis A**, Henrich C, Ruchkin V, Schwab-Stone M, Martin A. Psychosocial predictors of sexual initiation and high-risk sexual behaviors in early adolescence. *Child Adolesc Psychiatry Ment Health*. 2007 Nov 22;1(1):14.

**Kalanithi P**, Zheng W, Kataoka Y, DiFiglia M, Grantz H, Saper CB, Schwartz ML, Leckman JF, Vaccarino FM: Altered parvalbumin-positive neuron distribution in basal ganglia of individuals with Tourette syndrome. *Proceedings of the National Academy of Sciences of the USA* 2005; 102(37): 13307-13312.

Leckman JF, **Bloch MH**, King RA, Scahill L. Phenomenology of tics and natural history of tic disorders. *Adv Neurol*. 2006;99:1-16. Review

Martin A, Ruchkin V, **Caminis A**, Vermeiren R, Henrich CC, Schwab-Stone M. Early to bed: a study of adaptation among sexually active urban adolescent girls younger than age sixteen. *J Am Acad Child Adolesc Psychiatry*. 2005 Apr;44(4):358-67.

**Table F: Summary of Publications by Yale Cohen Fellows from 2005 to 2007.**

psychiatry faculty to apply for grants to fund the creation of KTGF Medical Student Fellowship sites at their schools. In other words, additional KTGF funding led to the replication of the DJC Fellowship at other medical schools under a new name, the KTGF Medical Student Fellowship. Following a strong response to the RFP, five new KTGF Fellowship sites were announced: Harvard Medical School, Johns Hopkins School of Medicine, Mount Sinai School of Medicine, Stanford School of Medicine, and UC Davis School of Medicine.

At Yale, the existence of the Fellowship is announced to the student body in September of every year using email, a school-wide student activities fair, and word-of-mouth generated by faculty and former Fellows. At the first meeting in October, interested medical students are introduced to some of the faculty mentors. Fellowship organizers also distribute a list of all participating faculty mentors along with biographies and summaries of their research

*The Donald J Cohen Fellowship mentoring program gave me my first opportunity to work with children as a medical student. I volunteered in an anger management group for the YNH in-patient child psychiatry department. I have always known that I want to work with children in my future career, but before the program I never considered psychiatry. However since participating and then leading the program, my interest in the field of child psychiatry has grown, as it incorporates many of my interests: listening to children's stories and feelings, using creativity and play, understanding the families' dynamics, and, ultimately, making a positive impact in their lives.*

*- Stephanie Nguyen, 2007/2008  
Yale Student Leader*

interests. Students are asked to submit a wish list of faculty mentors in order of preference, and Fellowship organizers do their best to match students with their top mentor choices. Mentors and mentees are then free to meet as often and as regularly as their schedules allow, and they are encouraged to join in monthly group-wide Fellowship meetings. The faculty leaders of the Fellowship, Drs. Leckman and Andres Martin, strongly encourage the mentors to include medical students during interactions with child psychiatry patients and their families. While the faculty leaders feel that clinical experiences in child psychiatry are powerful teaching tools, research has also shown that such experiences have positive outcomes on medical students' perception of a medical specialty.(17)

At the group meetings, current and former Fellows give presentations about significant Fellowship experiences, covering a wide range of topics in child and

adolescent psychiatry. In an effort to encourage open access to the Yale Child Study Center and its resources for the entire student body, all medical students, including non-Fellows, are invited and encouraged to join the monthly meetings.

Encouraged by growing participation among medical students and committed faculty, the KTGF sent out another RFP in 2006 to more than 20 medical schools in an effort to continue growing the network of Fellowship schools. In 2007, the following institutions were selected as the newest Cohen Fellowship sites, bringing the total to 11 schools: Brown University School of Medicine, Mayo Medical School, University of Maryland School of Medicine, University of North Carolina School of Medicine, and the University of Vermont College of Medicine. While this group of 11 medical schools hosting the Fellowship represents a growing and coordinated effort to recruit students into the field of child and adolescent psychiatry, it also represents an emerging network of academic departments with faculty members who are looking to advance the field in general. After the newest sites were announced in early 2007, Mr. Arzubi and Dr. Martin, the current faculty leader of the KTGF Fellowship at Yale, leveraged the network's reach to complete a multi-site study examining the impact of the Fellowship on medical students' career choices and on their understanding of the field of child and adolescent psychiatry. Concurrently, interest in child and adolescent psychiatry and the understanding of the subspecialty among the general medical student population at all 11 medical schools was evaluated. Unfortunately, approval from the IRB at the University of Maryland School of Medicine was not secured in time to include its students in the study.

## METHODS

Mr. Arzubi, working closely with Dr. Martin, designed a survey using SurveyMonkey.com, an online survey design tool, and distributed a link to the instrument via email to all students (N=4,677) from the ten medical schools in this study. The Institutional Review Board at the University of Vermont indicated it did not need to approve the study as respondents were voluntarily answering a survey evaluating a program in which they participated. Unsurprisingly, the response rate among current and former Fellows was dramatically higher than the overall response rate, a number that combined responses from both Fellows and non-Fellows from all schools. In total, 70% (123/175) of current and former Fellows completed the instrument, while the overall response rate was 22% (1,039/4,677). At the time of the survey, the five sites which were announced in 2007 had not yet started the Fellowship, so the Fellows responding to the survey necessarily included only those attending medical schools which introduced the Fellowship in either 2002 or 2005, namely Yale, Harvard, Johns Hopkins, Mount Sinai, Stanford, and U.C. Davis. The questions directed to non-Fellows were answered by students attending all 10 medical schools participating in this study. The survey was made up of 46 items, a combination of mostly multiple choice questions and a few requiring free responses (see Appendix). The flexibility and modularity of the online tool allowed students to quickly navigate the survey so that they only had to answer questions which were relevant to each respondent. For example, Fellows were asked several questions specific to the Fellowship, while non-Fellows were not directed to that section. Moreover, only students indicating some level of interest in a career in child and

adolescent psychiatry were asked to answer questions designed to assess the history and source of that interest.

**Table G: Summary of responses to web-based survey organized by medical school.**

Year Started	Medical School	Enrollmt	Total Fellows	Fellow Response	Non-Fellow Response	Fellow Resp Rate(%)	Total Resp Rate(%)
2002	Yale School of Medicine	390	98*	64	113	65	45
2005	Harvard Medical School	771	29	19	143	66	21
	Johns Hopkins School of Medicine	482	9	8	82	89	19
	Mount Sinai School of Medicine	487	10	9	70	90	16
	Stanford School of Medicine	463	8	4	38	50	9
	UC Davis School of Medicine	399	21	19	78	91	24
2007	Brown University School of Medicine	360			79		22
	Mayo Medical School	165			52		32
	University of Maryland School of Medicine	620			-		-
	University of North Carolina School of Medicine	735			91		12
	University of Vermont College of Medicine	425			170		40
Totals**		4677	175	123	916	70%	22%

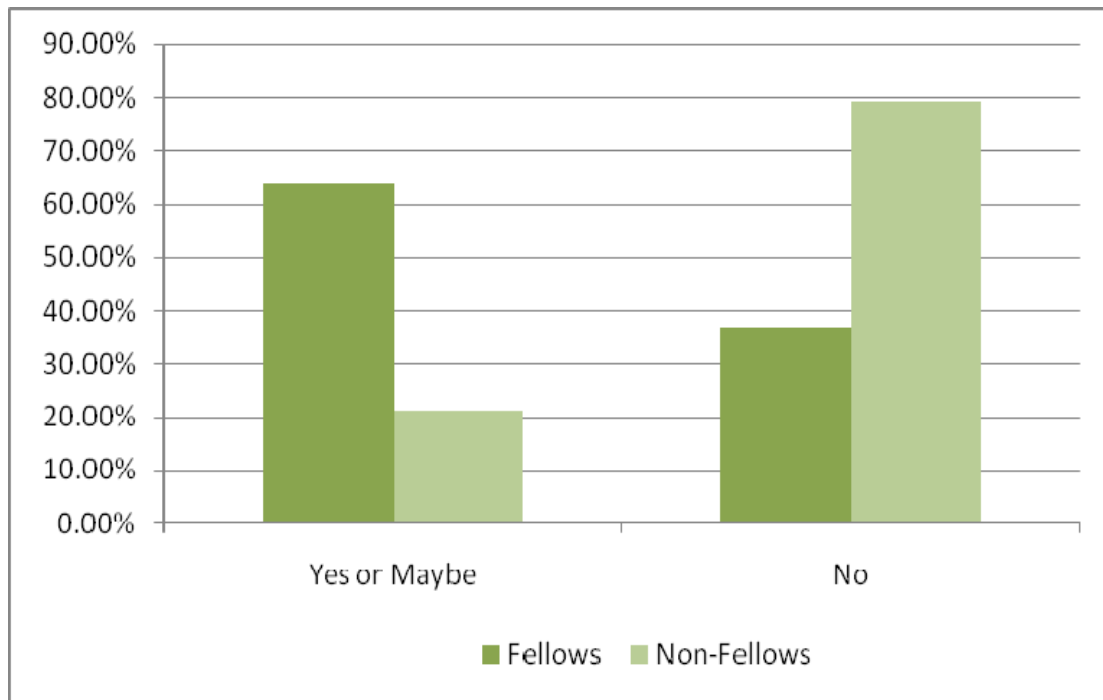
\* This includes a number of former Fellows who had already graduated from Yale.

\*\*Totals do not include the University of Maryland School of Medicine.

**Table H: Perceptions and knowledge of child psychiatry among medical students in general, ie. students who did not participate in a child psychiatry fellowship.**

<b>How much of the following qualities to you believe you possess? (1 = None...5 = A Huge Amount)</b>								
	n	1	2	3	4	5	Mean Score	SD
Desire to become a child psychiatrist.	922	51%	29%	15%	3%	1%	0.2	0.9
Awareness of pediatric psychosocial issues.	921	9%	29%	31%	24%	7%	2.9	1.1
Sensitivity to family dynamics.	920	3%	7%	29%	43%	18%	3.7	1.0
Ability to interact with child and adolescent patients.	923	3%	9%	26%	40%	22%	3.7	1.0
Understanding of the field of child psychiatry.	921	20%	40%	26%	11%	2%	2.4	1.0
Interest in conducting child-related research.	920	28%	25%	24%	14%	9%	2.5	1.3

**Figure 2: Responses of Fellows and non-Fellows to the question  
“Are you considering a career in child psychiatry?”**



## RESULTS

Table G is summary of the schools participating in the survey and the corresponding response rates organized by KTGF Fellows and non-Fellows.

In order to assess the extent of child psychiatry knowledge and interest among medical students in general, non-Fellows were asked to examine six personal qualities and determine how much of each they believed to possess (see Table H). Answers were expressed on a five-point Likert scale in which 1 represented “None” and 5 represented “A Huge Amount” of the quality in question. Only 1% of students expressed a maximal desire to become a child psychiatrist and a mere 2% of students rated their understanding of the subspecialty a 5 out of 5. About 95% of students rated their desire to pursue a career in child psychiatry as average or lower, and 60% of students believed their understanding of the specialty was poor or non-existent by rating it a 1 or 2 out of 5. The relationship between child psychiatry knowledge and interest was examined more closely, yielding an association that makes students with an above-average understanding of the field about 14 times more likely (OR=14, 7.4-27.4, CI 95%) to express an above-average interest in pursuing a career in the subspecialty. Responses to the four other statements reveal more promising data about self-perceived interest and abilities in child psychiatry among medical students. 31% of students indicated an above-average awareness of pediatric psychosocial issues, 61% of students rated their sensitivity to family dynamics as better-than-average, 62% of students rated their ability to interact with child psychiatry patients as above-average, and 23% of students indicated a better-than-average interest in

**Table I: Non-fellows list reasons for ruling out a career in child psychiatry.**

<b>Why have you decided to rule out child psychiatry as a career option? (you can pick more than one answer)</b>		N=730
I would miss the 'physical' part of medicine.		63%
I would feel limited by focusing ONLY on the mind and psycho-social issues.		46%
I can't do something that focuses ONLY on talking to patients		36%
It's too hard to spend a career facing kids who are suffering from mental anguish.		29%
There is a stigma attached to being a 'shrink'.		9%

**Table J: Free-response answers explain in part why students rule out a career in child psychiatry.**

<b>Theme</b>	<b>Comments</b>
<i>Negative Stereotypes of Child Psychiatry</i>	<ul style="list-style-type: none"> <li>• Interventions have little effect on outcomes.</li> <li>• Child and adolescent psychiatry is mostly medication management.</li> <li>• Income and job opportunities are limited.</li> <li>• There is little “science” or evidence behind the practice of child and adolescent psychiatry.</li> <li>• Child and adolescent psychiatrists are no more effective than psychologists, social workers or school counselors.</li> <li>• Other specialties provide a more “hands-on” therapeutic relationship.</li> <li>• The source of many behavioral problems in children is the family and environment, not a brain-based pathology.</li> <li>• Dealing with children’s parents is very difficult.</li> </ul>
<i>Negative Perceptions of Child Psychiatry Training and Education</i>	<ul style="list-style-type: none"> <li>• Most programs do not address pediatric mental illness until the completion of adult psychiatry training.</li> <li>• The training to become a child and adolescent psychiatrist is too long.</li> <li>• It makes more sense to complete a pediatrics residency before specializing in child and adolescent psychiatry.</li> <li>• Not enough exposure to child and adolescent psychiatry during undergraduate medical education.</li> </ul>
<i>Negative Stereotypes of Psychiatry in General</i>	<ul style="list-style-type: none"> <li>• Psychiatrists are not considered “real doctors”.</li> <li>• Psychiatrists have to give up the practice of physical medicine.</li> </ul>



pursuing child-related research. When asked directly “Are you currently considering a career in child psychiatry?”, 79% of non-Fellows answered ‘No’, while 21% answered ‘Yes’ or ‘Maybe’.

Students who ruled out a career in child psychiatry were asked to check all the reasons that helped to explain why they were no longer considering the specialty (see Table I). The most frequently chosen answer was “I would miss the ‘physical’ part of medicine”, with 63% of students checking it as a reason. Twenty-nine percent of respondents indicated it may be too difficult to work with children suffering from mental anguish and 9% of students ruled out a career in child psychiatry in part because there is stigma associated with being a ‘shrink’. Students were also given the opportunity to list other reasons for ruling out a career in child psychiatry as part of a free-response question. Table J lists medical student comments according to themes, explaining in part why they have chosen not to pursue a career in child psychiatry.

### **Evaluating the KTGF Fellowship**

The average ages of Fellows and non-Fellows are equal at 26 years; however, there were differences in gender and life experiences. 66% of Fellows were female compared to 63% of non-Fellows, and 65% of Fellows reported taking time off before medical school to pursue other interests compared to 60% of non-Fellows who reported doing the same.

**Table K: Frequency of college majors among KTGF Fellows and non-Fellows.**

<b>Primary Undergraduate Major of Fellows and Non-Fellows (%).</b>			
Ratio = Fellow % divided by Non-Fellow %			
	Fellow n=122	Non-Fellow n=964	Ratio
Psychology	15	7	2.1
Other Science	7	3	2.0
Music, Theatre or Art	3	2	1.7
Neuroscience	13	8	1.6
English, Literature or Writing	4	4	1.1
Health, Nursing, Child Development	3	2	1.0
Finance, Economics or Business	3	3	1.0
Genetics, Biochemistry	9	10	0.9
History of Medicine or Science	2	2	0.9
Biology	28	34	0.8
Computer Science	1	1	0.8
History, Int'l Affairs, For. Language	9	11	0.8
Chemistry	3	5	0.6
Math or Engineering	2	5	0.3
Religion or Philosophy	0	2	-
Women or Gender Studies	0	1	-
	100	100	

The frequency of undergraduate majors among Fellows revealed some interesting differences when compared to the frequency of majors among non-Fellows.(see Table K) The majors, which were entered by respondents in a free response question, were organized into 16 different categories to simplify the analysis. After listing the frequency of the majors for Fellows and non-Fellows, we compared the relative frequency of each major through simple division. For example, the percentage of psychology majors among Fellows (15%) was 2.1 times as large as it was among non-Fellows (7%). As a result, in relative terms, the five most popular majors among Fellows were psychology, other science (2x), music/theatre/art (1.7x), neuroscience (1.6x), and English/literature/writing (1.1x). The bottom three majors among Fellows were math/engineering (0.3x), religion/philosophy (no Fellows), and women/gender studies (no Fellows).

Medical students were also asked to identify other medical specialties which they are still considering. We asked “Are you still considering these specialties as potential career choices?” and listed 20 specialties from which students could select, answering “Yes”, “No”, or “Maybe”. In Table L, the specialties

*The Fellowship did not convince me that I wanted to pursue a career in child psychiatry, but I think that it provided me with exposure to the field that will be useful to my career as a pediatric subspecialist who might have patients who also see child psychiatrists. I think it is a huge benefit to know what physicians in related fields are doing, so I think it was a useful activity for me even if it did not determine my career path.*

- Tamara Miller, Yale Student Leader (2006/2007)

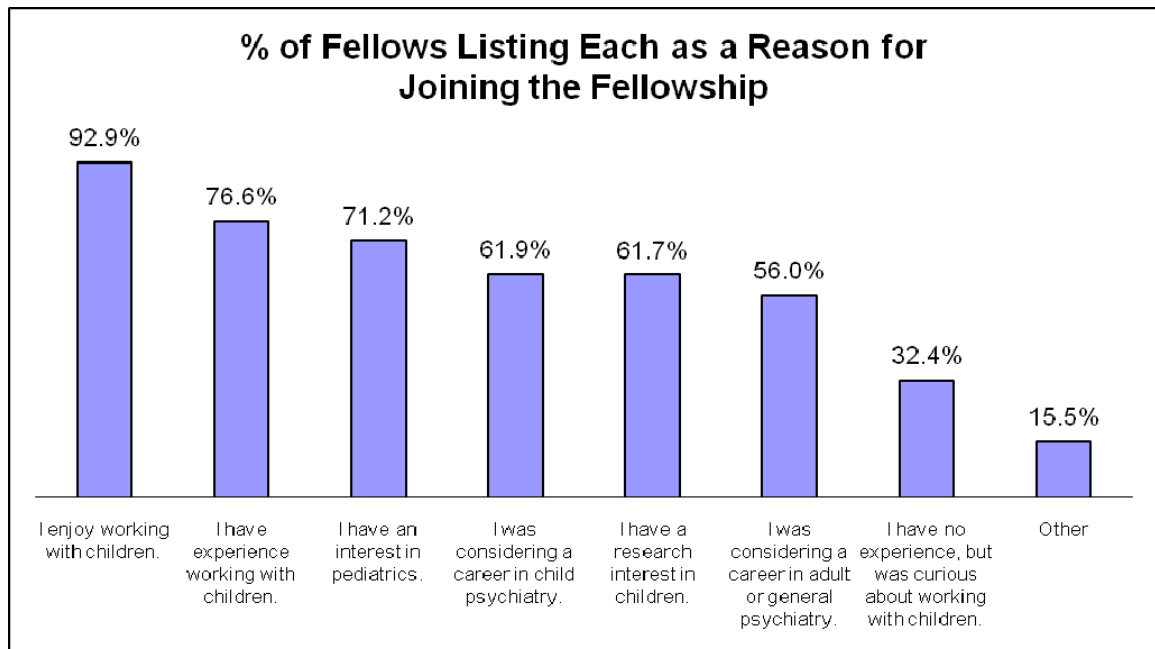
are listed along with the percentage of “Yes” responses from among Fellows and non-Fellows. Only four of the specialties were more popular among Fellows compared to non-Fellows: pediatrics (45% vs. 40%), adult psychiatry (33% vs. 12%), neurology (21% vs. 19%), and pediatric neurology (19% vs. 15%).

In order to assess the motivation among medical students for joining the Fellowship, we asked “Why did you first consider joining the Fellowship?” Below the question stem, we provided eight options, including “Other” so that students could elaborate in the form of a free response. The most popular response was “I enjoy working with children”, with 93% of respondents indicating it was true for them. Interestingly, 62% of Fellows indicated they joined because they were already considering a career in child and adolescent psychiatry. In this question, we made no attempt to assess how strongly they were considering a career in child and adolescent psychiatry before joining the Fellowship. Other important reasons for joining the Fellowship included experience working with children (77%), an interest in pediatrics (71%), and a research interest in children (62%).(see Figure 3)

**Table L: Percentage of Fellows and non-Fellows still considering each Specialty as a career choice.**

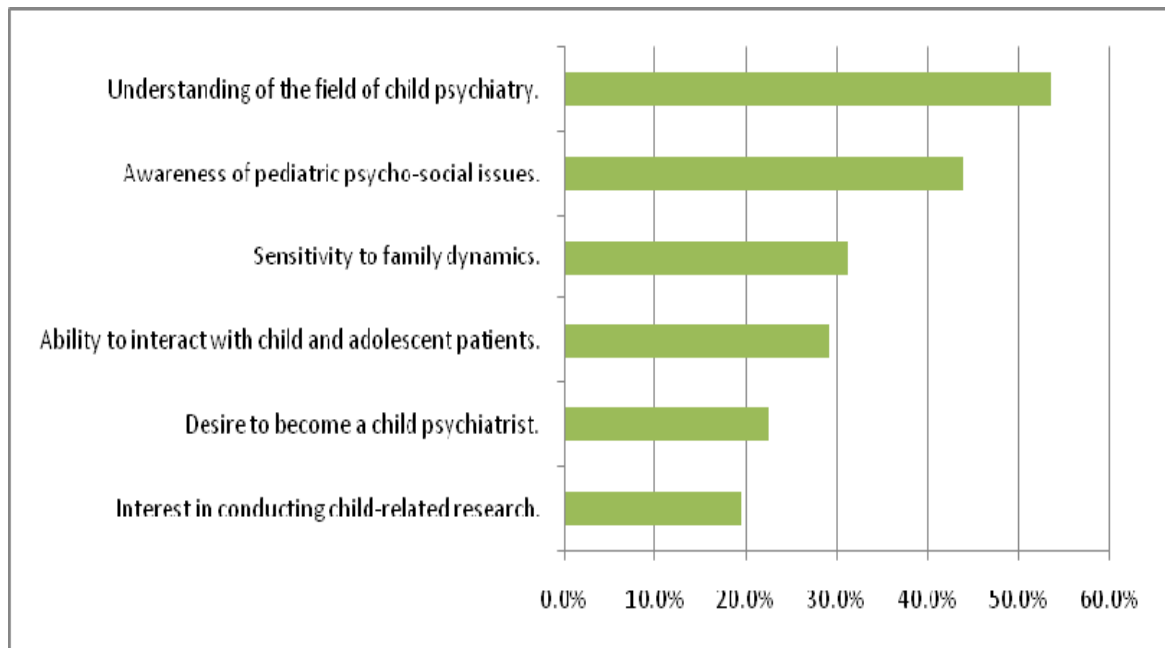
% of Fellows and Non-Fellows Still Considering Each Specialty		
	Fellows n=89	Non-Fellows n=892
Pediatrics	45	40
Internal Medicine	34	44
Adult Psychiatry	33	12
Neurology	21	19
Pediatric Neurology	19	15
Emergency Medicine	18	25
Family Medicine	14	24
Ob/Gyn	10	19
Neurosurgery	7	8
Anesthesiology	6	14
Diagnostic Radiology	6	12
Radiation Oncology	5	11
Dermatology	3	8
Otolaryngology	3	9
Urology	3	8
General Surgery	2	21
Ophthalmology	2	9
Orthopaedic Surgery	2	10
Plastic Surgery	2	9
Pathology	0	7

**Figure 3: Percentage of students listing each reason for joining the Fellowship**



**Table L: Self-reported impact of the KTGF Fellowship on participants.**

<b>How did the Fellowship affect you? Please rate the impact on each of the following items.</b>				
	n	Greatly increased.	Slightly increased.	No impact
Understanding of the field of child psychiatry.	103	<b>53%</b>	43%	4%
Awareness of pediatric psycho-social issues.	103	44%	<b>50%</b>	7%
Sensitivity to family dynamics.	103	31%	<b>55%</b>	14%
Ability to interact with child and adolescent patients.	103	29%	<b>48%</b>	23%
Desire to become a child psychiatrist.	103	22%	38%	<b>40%</b>
Interest in conducting child-related research.	103	19%	<b>48%</b>	33%

**Figure 4: Percentage of Students Indicating the Fellowship "Greatly Increased" the Attribute.**

In order to assess the impact of the Fellowship on participating medical students, we asked them to rate six items using a 3-point scale ranging from “Greatly increased” to “No impact”. Based on the two items receiving the highest ratings, it appears that the Fellowship made its biggest impact as a learning experience. 53% of respondents indicated that their understanding of the field of child and adolescent psychiatry was “Greatly increased”, while 44% of Fellows said the same about their awareness of pediatric psychosocial issues. Since the Fellowship was largely conceived in part as a recruiting initiative, it may seem disappointing that 78% of students felt the Fellowship had little or no impact on their desire to become a child and adolescent psychiatrist. Considering that 62% of participating medical students joined the Fellowship because they were already interested in specializing in child and adolescent psychiatry, it is indeed encouraging that the Program “Greatly increased” the desire of 22% of the

Fellows to become child psychiatrists.(see Table L and Figure 4)

*I went to a Fellowship meeting my very first year of medical school and have been working with child psychiatrists in a clinical or research capacity ever since. So, first and foremost, the Fellowship connected me to these clinicians and researchers I might not have met until third year or later (if at all), and to other students who were interested in child development, families, psychiatry, or some other area that was captured by people involved in the Cohen Fellowship. The larger impact this had on me is that I was exposed to and deeply interested in a lot of questions that came out of clinical encounters as a Fellow that I realized were best addressed through psychiatry, and so decided to pursue this as my choice of residency.*

- Argo Caminis, Yale Med Class of 2008

Unfortunately, this important question, which was crafted to measure the impact of the Fellowship on medical students, has two obvious limitations. First, it is part of a cross sectional study design asking students to assess the effects of the Fellowship on themselves. Secondly, the rating scale was limited to three measures, from “Greatly increased” to “No impact”. The scale should have been broader and included “Slightly

decreased” and “Greatly decreased” to provide more symmetry; however, the information collected from this question is useful, providing valuable information about the perceived impact of the Fellowship and it serves to improve the survey instrument for future studies.

While the Fellowship was extremely effective in teaching students about child psychiatry, it was also successful in dramatically affecting career choices among several students. (see Table V under “Yale”, p. 67) Additionally, the Fellowship brought together students with an existing interest in the subspecialty and it appeared to sustain that interest. In fact, 64% of Fellows answered they are currently considering a career in child psychiatry, a statistic that compares favorably to the 62% of medical students who indicated they joined the Fellowship in part because they were already considering a career in child psychiatry. Without participation in the Cohen Fellowship, medical students are less likely to sustain a nascent interest in the field of child and adolescent psychiatry. For example, 25% of Non-Fellows in their first or second year of medical school indicated they may be considering a career in child psychiatry compared to a lower 17% for students in their third year or beyond. In fact, students in their first or second year of medical school are 1.7x (OR 1.2-2.4, 95% CI) more likely to express an interest in the specialty compared to their older peers. Understandably, the overall interest in pursuing a child psychiatry career was lower among non-Fellows than among Fellows. 79% of non-Fellows (N=923) indicated that they have ruled out career in child and adolescent psychiatry, while 21% (N=193) of medical students answered “Yes” or “Maybe” when asked if they were still considering a career in the subspecialty.

The survey included several questions designed to assess the quality of the Fellowship experience and to examine the level of participation among medical students. In general, students were extremely pleased with their Fellowship experience. Fellows were asked to rate their overall experience plus four components of the Fellowship on a five-point scale ranging from “Terrible” to “Excellent”. Four of the five items were rated “Good” or “Excellent” by at least 80% of the respondents; only patient contact was rated slightly lower, with 79.1% of students rating it “Good” or “Excellent”.

Although the Fellowship was rated highly as an educational experience among medical students with 85.3% of them rating it “Good” or “Excellent”, we wanted to better understand what medical students were hoping to learn. Students who had expressed an interest in a child psychiatry career were asked to identify topics related to the field about which they wanted to learn more; they were asked to pick from among five topics and they were given the option to choose “Other” and list a different topic. Interestingly, both Fellows (N=66) and non-Fellows (N=185) indicated that they would most like to learn about child development and neurology in child psychiatry. 36% of Fellows and 31% of non-Fellows picked child development, while 21% of Fellows and 21% of non-Fellows indicated they wanted to learn more about neurology in child psychiatry.

We also asked Fellows who had expressed an interest in pursuing a career in child and adolescent psychiatry to suggest elements of the Fellowship that should be highlighted when recruiting medical students in the future. Sixty-eight of the Fellows answered this question, with 44% of them suggesting an emphasis on the clinical experiences of the Fellowship and 29% indicating the mentoring relationship should be underscored during recruitment. Since this question asked students which elements of



the Fellowship should be advertised in the future, it can be considered a proxy for a quality rating of each element. In fact, it is likely a better indicator of the relative quality of the components since the mean ratings for were so closely clustered around “Good” and “Excellent”. In this context, it appears that the Fellowship’s clinical experiences and

mentoring relationships were most

memorable, while the Fellowship

meetings, chosen by 3% of the

Fellows to emphasize during

recruitment, were likely held in lower

esteem. It is important to note that the

opinions of non-Fellows, who often

attended the monthly meetings, were

not collected as part of this study.

Attendance of the monthly meetings

at Yale continues to be very strong

despite the opinions expressed

through this survey.

Several questions were asked

about the level of participation in the

Fellowship among the participants.

46% of the Fellows reported attending

75% or more of the group meetings,

while the remaining 54% of

#### Sample of research activity among KTGF Fellows.

- ✓ *Worked with investigators as part of the Childhood Autism Risks from Genetics and the Environment Study (CHARGE) at the University of California at Davis.*
- ✓ *Reviewed the latest research on attention deficit-hyperactivity disorder (ADHD) and presented key findings to elementary school teachers.*
- ✓ *Conducted research on adolescent depression.*
- ✓ *Started doing research on autism and chose that topic as my special studies module.*
- ✓ *Doing a study of medication use and physician specialty in kids.*
- ✓ *Diffusion Tensor Imaging and white matter changes in early-onset schizophrenia.*
- ✓ *Researched ADHD in the Latino and African American population and presented findings to an undergraduate class of students who volunteer at a local free clinic.*
- ✓ *Conducted an educational session on the myths of psychotropic medications for a group of inpatient adolescent patients.*
- ✓ *Cross sectional study on factors related to early adolescent sexual activity and a longitudinal study on psychosocial risk factors related to early adolescent sexual activity.*
- ✓ *Post-mortem histological study of brains from patients with Tourette’s.*
- ✓ *In the summer after my first year, I was introduced to a child psychiatry project at the NIMH by my mentor and received a fellowship to complete that project. Then, I decided to apply for a joint MD/Master’s program and was introduced to my current PI by my mentor and received a one year research grant to complete that work.*

respondents said they attended the meetings less than 75% of the time. In general, Fellows met with their mentors monthly or a few times per semester; 47% of students reported meeting with their mentors one or two times per semester and 33% of students said they met with their mentor once or twice monthly. Nearly 10% of Fellows reported meeting with their mentors at least weekly. Fellows were generally pleased with the frequency of their mentor meetings. 61% of Fellows said the frequency was just right and 39% said they didn't feel they had enough meetings with their mentors. No one reported that they met with their mentors too often. Mentorship was central to the design of the Cohen Fellowship and it was the component which was most highly rated, with 54% of Fellows giving it an "Excellent". Given the importance of mentorship to the success of the Fellowship, we asked Fellows to rate eight items related to mentorship on a five-point scale. (see Table Q, p. 62) Fellows were asked how much of the eight items they were able to get from the mentoring relationship; the rating scale ranged from "Nothing" to a "Huge Amount". The two most highly rated items were "Good interpersonal relationship", with 63% of Fellows rating it "A lot" or a "Huge Amount", and "Clinical learning experience" was given a similar rating by exactly 50% of the Fellows. Fellows felt that the mentoring relationship contributed least to items related to basic science education and research proficiency. 55% of Fellows indicated the mentoring relationship contributed "Nothing" as a basic science learning experience. The contribution to the research learning experience was rated "Nothing" by 42% of Fellows and 38% said they received no research guidance from their mentors.

Although mentorship did not appear to have much of a direct effect on the research effort among Fellows, the participation in the Fellowship did lead to research-

related activities for over a third of the Fellows (34%). About one quarter of Fellows took part in a research project, 20% were awarded a summer fellowship, 12% published a paper, 8% were awarded a grant, and 6% listed another research-related activity.

61% of Fellows and 43% of non-Fellows elected to provide their own reasons and included written answers to explain why they were opting out of a career in child and adolescent psychiatry. Several students turned to other specialties because they felt that the training in child psychiatry was circuitous and too long. One student stated: “I’m sure I want to work with kids, but I’m unsure if I’d want to be a child psychiatrist, and there’s no way to do a pediatrics residency and then a fellowship in pediatric psychiatry. If I wanted to become a pediatric psychiatrist, I’d have to make that decision now, and do a psychiatry residency, not a peds residency.” Other students expressed reservations about the treatment options available in child psychiatry, explaining that they felt the range of options was too small, interventions made little impact on outcomes, and pharmacotherapy was most often the treatment focus. One medical student seemed particularly frustrated by what she felt child psychiatry could offer children: “There is so little known and a lot of child psychiatry seems to be giving meds that have been shown to work only empirically, with little understanding of the mechanism. It seems like there’s not a lot you can do to help the kids because they are often very seriously disturbed.”

## **DISCUSSION**

This is a critical moment in the history of child psychiatry. The field’s leaders have been documenting a shortage of physicians equipped to treat pediatric mental illness for well over three decades. In particular, several studies have reported a critical shortfall

**Existing research**

*Mentoring programs and student interest groups in isolation have demonstrated some level of success in boosting interest in medical specialties. Recommendations exist on how to improve individual mentoring programs and student interest groups at individual medical schools.*

**What this study adds:**

*This is the first evaluation of a multi-site mentoring program and student interest group, measuring the impact on medical student knowledge of a subspecialty and future career choices. Recommendations are provided on how to improve the effectiveness of a multi-site mentoring program and student interest group.*

**Directions for future research:**

*This is a cross-sectional study of a mentoring program and student interest group based on the collection of self-reported data. Future studies must evaluate the longitudinal impact of this type of intervention on student career choices and knowledge of a subspecialty. Additionally, future studies should evaluate the effectiveness of this study's recommendations. The data collection tool must be further refined to allow other medical specialties to evaluate their mentoring programs and interest groups.*

in the number of child psychiatrists, a problem that has been compounded by a poor geographic distribution of those clinicians across the U.S. Well-meaning child psychiatrists have been calling for improved recruitment and education initiatives for much of that span; however, few, if any, successful and sustainable models for expanding the reach of the field have emerged. The six-year evolution of the KTGF

Fellowship has yielded a unique vehicle with which to pursue several important goals in child psychiatry. First, the KTGF Fellowship is a recruitment and career development tool that joins the child psychiatry departments of 11 prestigious medical schools.

Secondly, the emergence of the KTGF network of child psychiatry departments makes it more likely that faculty will coordinate their efforts to develop, in conjunction with AACAP, minimum standards in medical school curricula for teaching child development and psychopathology. Thirdly, faculty, residents and medical students from each of the member schools must seize this opportunity and leverage the KTGF network to create multi-site research initiatives. This study, the first analysis of a multi-site mentoring

program, was only possible by taking advantage of the improving relationships among faculty and students at the 11 medical schools that host the KTGF Fellowship. Child psychiatry has long been perceived, rightly or wrongly, as a field that produces relatively little research compared to other medical specialties. The development of powerful, multi-site research projects could represent a step towards shedding a significant negative stereotype of child psychiatry. More importantly, the KTGF network could help produce a new generation of child psychiatrists that is more likely to produce and use rigorous research.

This study confirmed that many barriers continue to exist in the recruitment of medical students and residents into child psychiatry. Many of the old negative stereotypes persist and trainees have relatively little exposure to child psychiatry in the traditional medical school curriculum. The results of this study clearly demonstrate that students with a good understanding of child psychiatry are more likely to explore a career in the subspecialty. Additionally, other studies have revealed that medical students are more likely to consider careers in pediatrics and child psychiatry after they have been exposed to child psychiatry activities. The KTGF network could represent an advocacy group made up of faculty who coordinate lobbying efforts to secure more time in the medical school curriculum to teach key elements in child psychiatry. The added didactics would serve to increase student interest in the field and it would improve the training of primary care physicians who are likely to encounter children struggling with mental illness.

In the meantime, more medical students can be exposed to child psychiatry by boosting membership in the KTGF Fellowship and enhancing the visibility of the

program at each medical school. The five most popular college majors among medical students expressing an interest in a child psychiatry career included (1) psychology, (2) religion or philosophy, (3) neuroscience, (4) English, literature or writing, (5) music, theatre or art. In addition to announcing the existence of the Fellowship to all medical students at the beginning of each academic year, organizers at each KTGF site should identify incoming first-year students who majored in any of these areas and deliver targeted invitations to join the Fellowship. This is a simple marketing strategy aimed at enticing those who have been identified as the most likely ‘consumers’ of child psychiatry activities.

In January 2008, Yale hosted the third annual gathering of 60 KTGF Fellows and 10 faculty from 9 of the participating medical schools. This represents a significant jump in participation compared to the first two meetings. In 2006 and 2007, the gatherings were attended by students and faculty from Harvard and Yale, with each medical school alternating as host of the activities. A yearly gathering of this nature is important to continue growing an ‘esprit de corps’ among faculty and students. This year’s gathering included several presentations from medical students and child psychiatry fellows who described their research or especially impactful clinical relationships with patients and their families. In addition to generating a greater feeling of connectedness among participants, the meetings serve as important networking events for students looking to meet others with similar passions and interests. The annual gatherings will serve to reinforce positive experiences related to child psychiatry and counteract the many negative stereotypes that continue to circulate around medical school campuses and in clinical settings.

There are other strategies that the faculty and student leaders of KTGF sites could implement to tighten cross-country relationships and to guide the regular activities of the Fellowship. First, a mission statement should be drafted at the next annual gathering. The development of a mission statement will serve to stimulate productive discussion about the direction of the Fellowship and it will serve to anchor all future activities to a commonly designed goal. The mission statement should be prominently displayed on a KTGF network website. The website, which could be maintained for a year at a time by alternating schools in the network, would serve to improve communication across campuses. The website should list the names and interests of students and faculty. Additionally, there should be an area listing ongoing research projects and providing opportunities for participants to take part in the research projects. Another important component of the website would be a section on education. Medical students have clearly expressed a desire to learn more about child psychiatry and faculty should deliver. In particular, Fellows and non-Fellows are looking to learn more about child development, psychopathology, psychopharmacology, and neurology in child psychiatry. (see Table T, p. 66). Faculty could post learning modules to the website corresponding to each of these interests so that students looking to enhance their child psychiatry knowledge could access the information at their leisure. Furthermore, a common education section on the website could continue fueling discussions about nationwide standards in child psychiatry education across medical school curricula.

There are several limitations to this study. (see Table W, p. 69) First, this is a cross-sectional study relying on medical student self-reports. While the large number of total responses (N=1,039) in this unique multi-site study yielded rich data, a longitudinal

study using controls would produce more robust results. Secondly, the survey instrument was not uniformly scaled and every question did not provide an equal number of positive and negative answer choices. In the next stage of development of the survey instrument, a uniform and centered scale must be used to improve the quality of data. Additionally, questions must be rephrased so that other medical specialties can make use of the instrument to evaluate mentoring programs and student interest groups. There are many medical students who are not formally part of the Fellowship, but who do attend monthly meetings. In the future, an effort must be made to collect information about their reasons for attending child psychiatry-related activities.

The KTGF Fellowship, which began as a small mentoring program at the Yale Child Study Center, has evolved into a network of 11 child psychiatry departments from different medical schools. The network has the potential to play an important role in the expansion of child psychiatry built on three pillars: (1) recruitment and career development; (2) education and curriculum design; and (3) multi-site research initiatives. (see Figure 5, p. 61) This is the first multi-site research study produced by this new and evolving structure. After more than 30 years of papers describing the shortage of child psychiatrists and outlining recommendations to address the problem, it appears that the urgency has yielded a promising approach in the KTGF Fellowship. It joins nearly a dozen of the country's most prestigious medical schools in an effort to recruit and educate a new generation of child psychiatrists who are acutely aware of the state of the subspecialty. Students are provided rich clinical experiences, influential mentoring relationships, and critical network opportunities through the Fellowship. Moreover, medical students are given the responsibility to lead and evaluate many components of



the Fellowship. This year, the students and faculty at the Mt. Sinai School of Medicine, in collaboration with AACAP, are in charge of monitoring the progress and effectiveness of the Fellowship.

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## APPENDIX

**Table M: Survey distributed to non-Fellows.**

<ol style="list-style-type: none"> <li>1. How old are you?             <ol style="list-style-type: none"> <li>a. Choices ranged from '20 yrs' to 'over 41 yrs'</li> </ol> </li> <li>2. Please note your gender.             <ol style="list-style-type: none"> <li>a. Female</li> <li>b. Male</li> </ol> </li> <li>3. What were your college major(s)?             <ol style="list-style-type: none"> <li>a. First Major*</li> <li>b. Second Major*</li> </ol> </li> <li>4. Did you take time off between college and medical school?             <ol style="list-style-type: none"> <li>a. Yes</li> <li>b. No</li> </ol> </li> <li>5. What did you do between college and medical school?*</li> <li>6. Which medical school do you currently attend?*</li> <li>7. What year of medical school is this for you?             <ol style="list-style-type: none"> <li>a. 1<sup>st</sup></li> <li>b. 2<sup>nd</sup></li> <li>c. 3<sup>rd</sup></li> <li>d. 4<sup>th</sup></li> <li>e. 5<sup>th</sup>+</li> </ol> </li> <li>8. Please answer the following True/False questions about yourself. [<i>Respondents checked 'True' or 'False' for each item</i>]             <ol style="list-style-type: none"> <li>a. I enjoy working with children.</li> <li>b. I am considering a career in child psychiatry.</li> <li>c. I have experience working with children.</li> <li>d. I am considering a career in adult or general psychiatry.</li> <li>e. I have a research interest in children.</li> <li>f. I have an interest in pediatrics.</li> <li>g. I have no experience, but am curious about working with children.</li> </ol> </li> <li>9. How much of the following qualities do you believe you possess? (1 = None / 5 = Huge Amount) [<i>Respondents rated each item on a scale from 1 to 5</i>]             <ol style="list-style-type: none"> <li>a. Desire to become a child psychiatrist</li> <li>b. Awareness of pediatric psychosocial issues</li> <li>c. Sensitivity to family dynamics</li> <li>d. Ability to interact with child and adolescent patients</li> <li>e. Understanding of the field of child psychiatry</li> <li>f. Interest in conducting child-related research</li> </ol> </li> <li>10. Please check which of the following things you have been awarded or worked on. [<i>Respondents could pick more than one item.</i>]             <ol style="list-style-type: none"> <li>a. Research project</li> <li>b. Grant</li> <li>c. Summer Fellowship</li> <li>d. Publication</li> <li>e. Other (please specify)*</li> </ol> </li> <li>11. Are you currently considering a career in child psychiatry?             <ol style="list-style-type: none"> <li>a. Yes</li> <li>b. Maybe</li> <li>c. No</li> </ol> </li> </ol>
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*Respondents choosing 'Yes' or 'Maybe' in question 11 were directed to questions 12-14:*

12. When did you first become interested in child psychiatry?
  - a. Grade School or earlier
  - b. High School
  - c. College
  - d. During the time between College and Medical School
  - e. Medical School
13. Please describe why you are still considering a career in child psychiatry. Consider events, mentors or patients that may have sparked the interest.\*
14. Pick a topic about which you wish you could learn more.
  - a. Psychopharmacology
  - b. Child Development
  - c. Psychopathology
  - d. Genetics in Child Psychiatry
  - e. Neurology in Child Psychiatry
  - f. Other (please specify)\*

*Respondents choosing 'No' in question 11 were directed to questions 15 and 16:*

15. Why have you decided to rule out child psychiatry as a career option? (you can pick more than one answer)
  - a. I would miss the 'physical' part of medicine
  - b. I can't do something that focuses ONLY on talking to patients
  - c. It's too hard to spend a career facing kids who are suffering from mental anguish
  - d. I would feel limited by focusing on ONLY the mind and psycho-social issues
  - e. There is a stigma attached to being a 'shrink'
16. If you have another reason or would like to comment on your last answer, please write about it here.\*

*All respondents were directed to question 17:*

17. Are you still considering these specialties as potential career choices? [*Respondents could answer 'Yes', 'No' or 'Maybe' for each specialty.*]
  - a. Anesthesiology
  - b. Dermatology
  - c. Diagnostic Radiology
  - d. Emergency Medicine
  - e. Family Medicine
  - f. General Surgery
  - g. Internal Medicine
  - h. Neurology
  - i. Neurosurgery
  - j. Ob/Gyn
  - k. Ophthalmology
  - l. Orthopaedic Surgery
  - m. Otolaryngology
  - n. Pathology
  - o. Pediatrics
  - p. Pediatric Neurology
  - q. Plastic Surgery
  - r. Psychiatry, Adult
  - s. Radiation Oncology
  - t. Urology

**Table N: Survey distributed to Fellows**

1.	How old are you?
a.	Choices ranged from '20 yrs' to 'over 41 yrs'
2.	Please note your gender.
a.	Female
b.	Male
3.	What were your college major(s)?
a.	First Major*
b.	Second Major*
4.	Did you take time off between college and medical school?
a.	Yes
b.	No
5.	What did you do between college and medical school?*
6.	Please indicate which medical school you are currently attending.
a.	Yale
b.	U.C. Davis
c.	Johns Hopkins
d.	Mount Sinai
e.	Stanford
f.	Harvard
7.	What year of medical school is this for you?
a.	1 <sup>st</sup>
b.	2 <sup>nd</sup>
c.	3 <sup>rd</sup>
d.	4 <sup>th</sup>
e.	5 <sup>th</sup> +
8.	How many years have you been involved in the Fellowship?
a.	1 year
b.	2 years
c.	3 years
d.	4 years
9.	In which school year did you last participate in the Fellowship?
a.	2006/2007
b.	2005/2006
c.	2004/2005
d.	2003/2004
10.	How did you hear about the Fellowship?
a.	Email Announcement
b.	Flyer or Poster
c.	Classmate
d.	Faculty Member
e.	Other (please specify)*



11. Why did you first consider joining the Fellowship? [*Respondents were asked to identify each of the following statements as 'True' or 'False'*]
- I enjoy working with children.
  - I was considering a career in child psychiatry.
  - I have experience working with children.
  - I was considering a career in adult or general psychiatry.
  - I have a research interest in children.
  - I have an interest in pediatrics.
  - I have no experience, but was curious about working with children.
12. Is there another reason for joining the Fellowship which we have not listed?
- Yes
  - No
13. What was your reason for joining the Fellowship? [*Respondents generally answered this question only if they answered 'Yes' to question #12.*]
14. Please describe your attendance of Fellowship group functions.
- Never
  - Less than 25%
  - 25 to 75%
  - More than 75%
  - Perfect Attendance
15. How often did you meet with your mentor?
- Never
  - 1x or 2x per semester
  - 1x or 2x per month
  - Weekly
  - More than weekly
16. Did you have enough contact with your mentor?
- Yes, it was just right.
  - No, it was not enough.
  - No, it was too much.
17. Are you graduating this year?
- Yes
  - No
18. Will you be returning to the Fellowship next year?
- Yes
  - No
  - Maybe
19. Would you like to work with the same mentor next year?
- Yes
  - No

20. Please give the Fellowship an overall rating and then rate its components. *[Respondents could answer 'N/A' or give one of the following ratings: 1 = Terrible, 2 = Tolerable, 3 = Average, 4 = Good, 5 = Excellent.]*
- Overall Fellowship Experience
  - Patient Contact
  - Mentoring Relationship
  - Educational Experience
  - Fellowship Meetings
21. Please give us some quantitative information about your clinical exposure *[Answer choices included the following five options: 'None', '1-10', '11-20', '21-30', '31+']*
- How many child psychiatry patients did you meet?
  - How many families did you meet?
22. Was that enough clinical exposure for you? *[Three rating choices were given: 'Yes', 'No, not enough', 'No, too much']*
- Exposure to child patients
  - Exposure to patients' families
23. Tell us about your mentor and your mentor preference. *[Fellows were asked to apply one of the five following ratings to the items below: 'Pure researcher', 'More researcher than clinician', '50/50 blend', 'More clinician than researcher', 'Pure clinician']*
- This describes this year's mentor.
  - This describes my ideal mentor.
24. How much of the following items were you able to get from your mentoring relationship? *[Fellows were asked to rate eight items based on the following scale: 1 = 'Nothing', 2 = 'A little', 3 = 'Some', 4 = 'A lot', 5 = 'Huge amount']*
- Good interpersonal relationship
  - Clinical learning experience
  - Basic science learning experience
  - Research learning experience
  - Career guidance
  - Research guidance
  - Exposure to patients
  - Introduction to other professionals
25. Would you recommend your mentor to other students participating in the Fellowship?
- Yes
  - No
26. Please explain your previous answer. What is it about your mentor that prompted you to answer this way?\*
27. Do you feel that the Fellowship gave you access to other faculty members and mental health professionals besides your assigned mentor?
- Yes
  - No
28. If you answered "Yes" to the question above, please describe the contact you had with other professionals associated with child psychiatry.\*
29. How did the Fellowship affect you? Please rate the impact on each of the following items. *[The rating scale: 1 = 'No impact', 2 = 'Slightly increased', 3 = 'Greatly increased']*
- Desire to become a child psychiatrist
  - Awareness of pediatric psycho-social issues
  - Sensitivity to family dynamics
  - Ability to interact with child and adolescent patients
  - Understanding of the field of child psychiatry
  - Interest in conducting child related research

30. Please check any of the following which were made available to you as a direct result of your Fellowship experience
- Research project
  - Grant
  - Summer Fellowship
  - Publication
  - Other (please specify)\*
31. Please give us details about the type of project in which you were engaged as a result of the Fellowship.\*
32. Did you know of any students who dropped out of the Fellowship or stopped coming to meetings?
- Yes
  - No
33. Why do you think that person stopped coming?
- Didn't like child psychiatry
  - Too busy
  - Poor mentoring relationship
  - Didn't enjoy the group meetings
  - Other (please specify)\*
34. Are you still considering a career in child psychiatry?
- Yes
  - Maybe
  - No

*Respondents answering 'Yes' or 'Maybe' to question 34 were directed to questions 35-39:*

35. When did you first become interested in child psychiatry?
- Grade School or earlier
  - High School
  - College
  - During the time between College and Medical School
  - Medical School (Pre-Fellowship)
  - Medical School and the Fellowship Sealed the Deal
36. Please describe why you are still considering a career in child psychiatry. Consider events, mentors or patients that may have sparked the interest.\*
37. What element of the Fellowship do you think should be emphasized when recruiting medical students in the future?
- Clinical experiences
  - Mentoring relationship
  - Productive Fellowship meetings
  - Overall learning experience
  - Other (please specify)\*
38. What do you think is the most effective way to recruit students to next year's Fellowship experience?
- Email
  - Flyer or Poster
  - Word-of-mouth
  - Announcement by faculty
  - Other (please specify)\*
39. Pick a topic about which you wish you could have learned more.
- Psychopharmacology
  - Child Development
  - Psychopathology
  - Genetics in Child Psychiatry
  - Neurology in Child Psychiatry
  - Other (please specify)\*

*Respondents answering 'No' to question 34 were directed to questions 40-41:*

40. Why have you decided to rule out child psychiatry as a career option? (you can pick more than one answer)
- I would miss the 'physical' part of medicine
  - I can't do something that focuses ONLY on talking to patients
  - It's too hard to spend a career facing kids who are suffering from mental anguish
  - I would feel limited by focusing on ONLY the mind and psycho-social issues.
  - There is a stigma attached to being a 'shrink'
41. If you have another reason or would like to comment on your last answer, please write about it here.\*

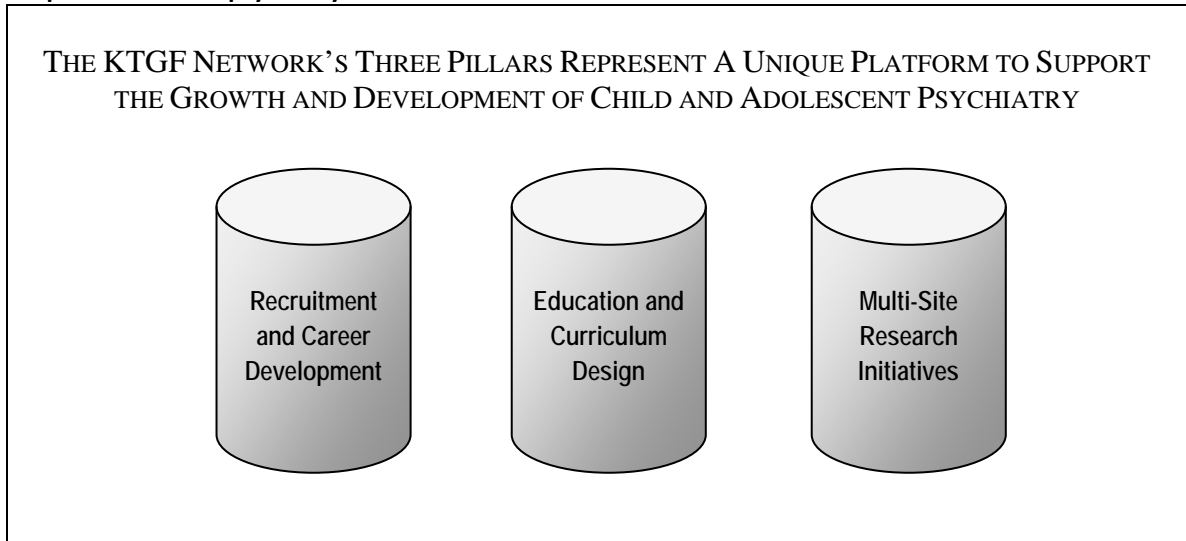
*All respondents were directed to questions 42-43:*

42. If you are graduating this year, what have you chosen as a medical specialty? (If you are graduating this year, SKIP the next question.)\*
43. Are you still considering these specialties as potential career choices? (To answer "NO", just leave the specialty unchecked)
- Anesthesiology
  - Dermatology
  - Diagnostic Radiology
  - Emergency Medicine
  - Family Medicine
  - General Surgery
  - Internal Medicine
  - Neurology
  - Neurosurgery
  - Ob/Gyn
  - Ophthalmology
  - Orthopaedic Surgery
  - Otolaryngology
  - Pathology
  - Pediatrics
  - Pediatric Neurology
  - Plastic Surgery
  - Psychiatry, Adult
  - Radiation Oncology
  - Urology

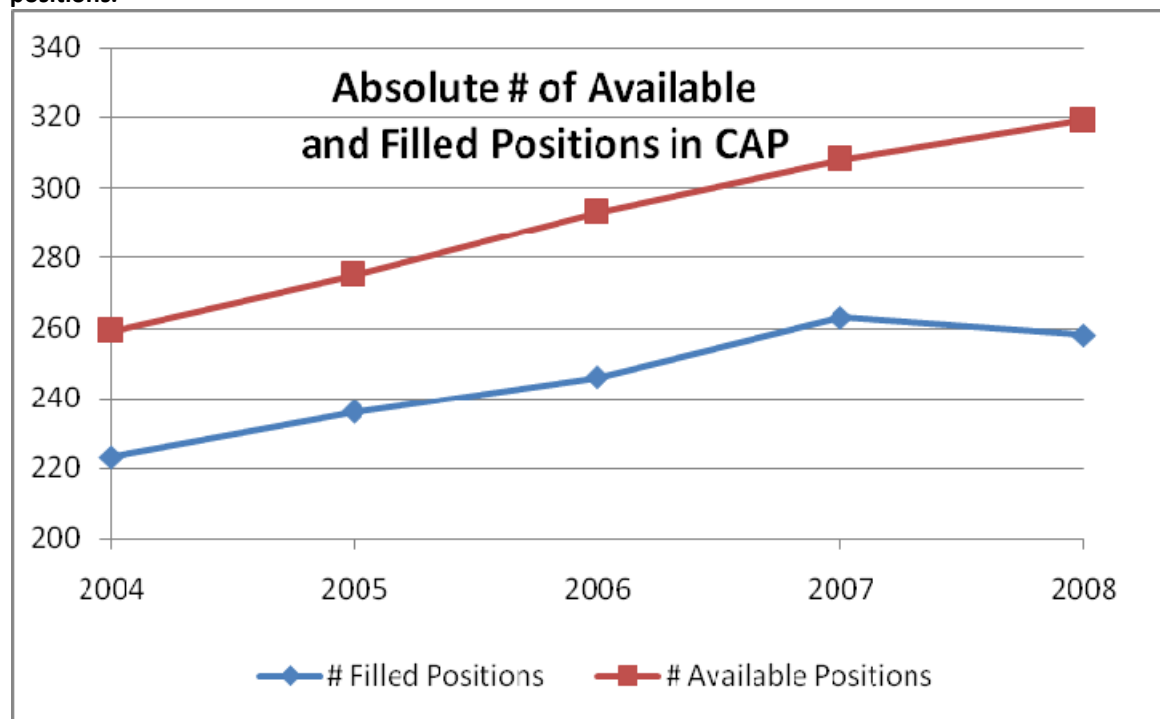
**Table O: Summary of Themes and Comments from Free Response Items in this Study**

Theme	Comments
<i>Interest in Child Psychiatry</i>	<ul style="list-style-type: none"> <li>• There is a dire need for more child and adolescent psychiatrists.</li> <li>• The convergence of psychiatry and neurology is exciting.</li> <li>• Very positive experience as a part of the Cohen Fellowship.</li> <li>• Child psychiatrists seem to be happy and enthusiastic about their work.</li> <li>• Students enjoy longitudinal relationships with patients.</li> <li>• Several students mentioned having prior exposure to child psychiatry through personal or community service experiences.</li> <li>• There appear to be many job opportunities and it seems to be an exciting time in the field of child psychiatry.</li> <li>• The field forces physicians to consider both biomedical and psychosocial factors when assessing patients.</li> <li>• Students with an interest in child development, brain and behavior often express an appreciation for child and adolescent psychiatry.</li> <li>• Some students cite the shortage of child psychiatrists and opportunities for new scientific discoveries as reasons for considering the field.</li> </ul>
<i>Mentoring Relationships</i>	<ul style="list-style-type: none"> <li>• Mentors were often passionate, friendly and willing teachers.</li> <li>• It is sometimes difficult for students and mentors to coordinate their schedules.</li> <li>• Mentors sometimes introduced students to other faculty members to help explore specific interests.</li> <li>• Many mentors went out of their way to make sure students learned as much as possible.</li> <li>• 24% of fellows who expressed a continued interest in child and adolescent psychiatry referred to “mentor” when describing the source of their interest in the free response question.</li> </ul>
<i>The Fellowship</i>	<ul style="list-style-type: none"> <li>• Perhaps medical students should be invited to complete a project in the field. *(I should address this in recommendations – identify a few students who can present at AACAP – create a forum for Cohen Fellows)</li> <li>• Students prefer that fellowship activities begin early in the school year, not in January.</li> <li>• Regular fellowship meetings should be more structured and perhaps include child and adolescent psychiatry didactics and career planning.</li> <li>• The fellowship sparked an interest in child and adolescent psychiatry that may have otherwise remained hidden.</li> <li>• The fellowship experience can vary based on the quality of the mentoring relationship.</li> <li>• The fellowship is one of the few opportunities for exposure to clinical medicine in the first year.</li> <li>• While the fellowship may be a recruitment tool, it also serves to improve students’ opinions of psychiatry in general.</li> </ul>
<i>Networking</i>	<ul style="list-style-type: none"> <li>• Mentors often introduced students to colleagues and senior trainees.</li> <li>• The joint meetings with other fellowship schools were great for meeting students with similar interests.</li> <li>• Several mentors made introductions for students that led to research projects and summer fellowships.</li> <li>• Mentors introduced students to other faculty members to provide more clinical shadowing experiences.</li> </ul>

**Figure 5: Representation of the three key elements of the KTGF Fellowship platform for future expansion of child psychiatry.**



**Figure 6: Number of new child psychiatry fellows divided by the total number of available fellowship positions.**



**Table P: Rating of the Fellowship and its components by participating students.**

<b>Please give the Fellowship an overall rating and then rate its components.</b>						
Percentage (%) of respondents choosing each answer.						
	<b>n</b>	<b>Terrible</b>	<b>Tolerable</b>	<b>Average</b>	<b>Good</b>	<b>Excellent</b>
Overall Fellowship Experience	102	2	5	10	40	<b>43</b>
Patient Contact	91	3	3	14	34	<b>45</b>
Mentoring Relationship	98	2	4	9	31	<b>54</b>
Educational Experience	102	1	5	9	<b>44</b>	41
Fellowship Meetings	95	0	4	15	<b>45</b>	36

**Table Q: Evaluation of the mentoring relationship by participating Fellows.**

<b>How much of the following were you able to get from your mentoring relationship?</b>					
Percentage (%) of respondents choosing each answer. (N=102)					
	Nothing	A little	Some	A lot	Huge Amount
Good interpersonal relationship.	5	7	26	29	<b>33</b>
Clinical learning experience.	9	14	28	<b>36</b>	14
Basic science learning experience.	<b>55</b>	22	16	5	3
Research learning experience.	<b>42</b>	16	25	12	6
Career guidance.	14	16	<b>31</b>	28	12
Research guidance.	<b>38</b>	19	21	15	8
Exposure to patients.	11	15	<b>32</b>	25	18
Introduction to other professionals.	18	17	<b>26</b>	25	16

**Table R: Percentage (%) students interested in each medical specialty expressing interest or no interest in a child psychiatry career.**

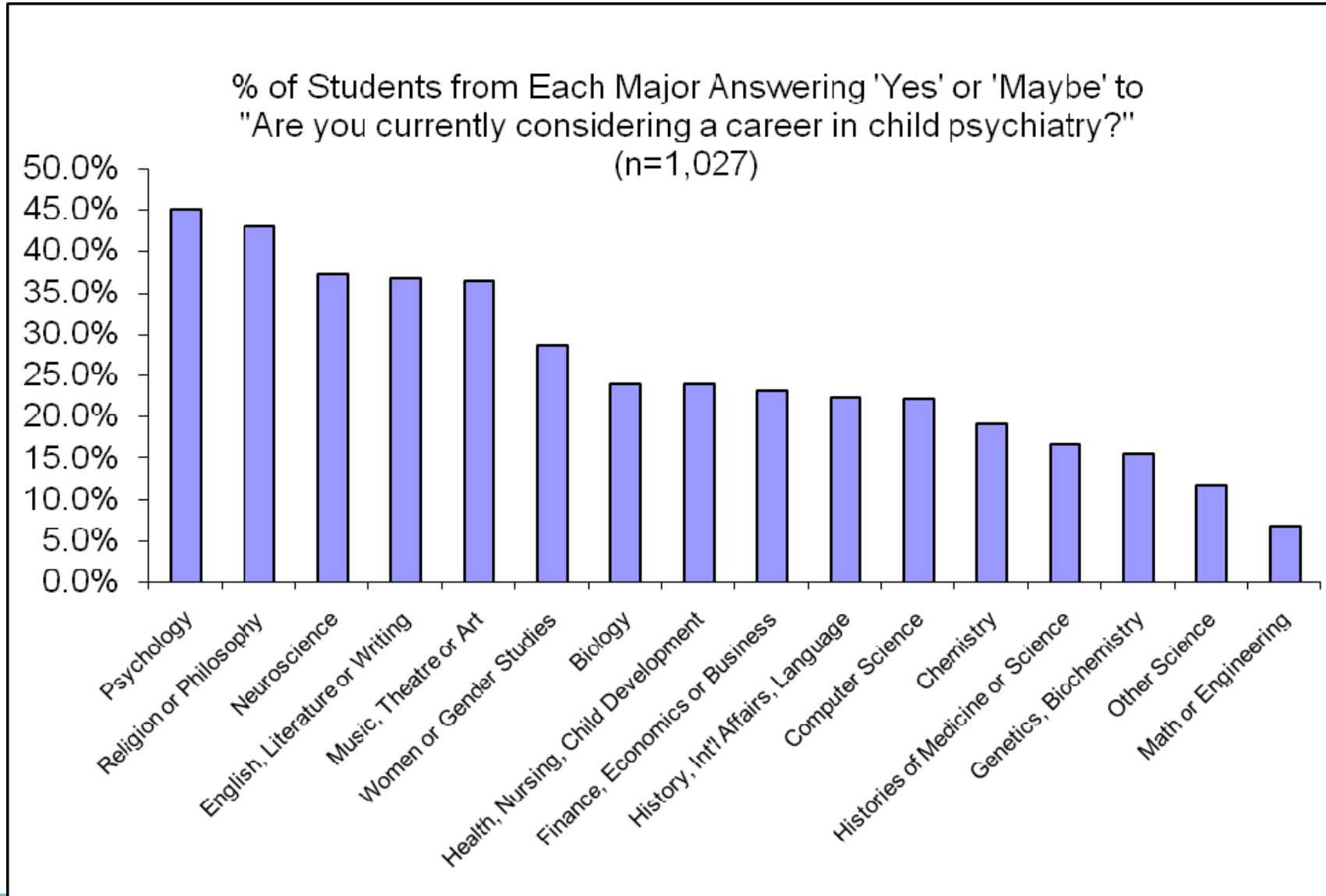
<b>Medical Students Still Considering Each of the Specialties Organized by Answer to the Question: “Are you still considering a career in child and adolescent psychiatry?” (N=981)</b>			
	Yes/Maybe	No	Total
Adult Psychiatry	77	23	100
Pediatric Neurology	47	53	100
Family Medicine	37	63	100
Pediatrics	35	65	100
Neurology	34	66	100
Ob/Gyn	33	67	100
Dermatology	29	71	100
Radiation Oncology	28	72	100
Emergency Medicine	25	75	100
Internal Medicine	24	76	100
Diagnostic Radiology	23	77	100
Neurosurgery	21	79	100
Anesthesiology	20	80	100
Urology	19	81	100
Pathology	19	81	100
Orthopaedic Surgery	16	84	100
General Surgery	16	84	100
Otolaryngology	15	85	100
Ophthalmology	14	86	100
Plastic Surgery	14	86	100



**Table S: Percentage (%) of medical students by college major expressing an interest or no interest in a child psychiatry career.**

<b>College Major of Medical Students Organized According to Their Answer to the Question: “Are you currently considering a career in child and adolescent psychiatry?”</b>				
First Major	n	Yes/Maybe	No	Total
Psychology	82	45	55	100
Religion or Philosophy	21	43	57	100
Neuroscience	86	37	63	100
English, Literature or Writing	38	37	63	100
Music, Theatre or Art	22	36	64	100
Women or Gender Studies	7	29	71	100
Biology	350	24	76	100
Health, Nursing, Child Development	25	24	76	100
Finance, Economics or Business	26	23	77	100
History, Int'l Affairs, Language	116	22	78	100
Computer Science	9	22	78	100
Chemistry	52	19	81	100
Histories of Medicine or Science	18	17	83	100
Genetics, Biochemistry	97	16	84	100
Other Science	34	12	88	100
Math or Engineering	44	7	93	100
<b>Total</b>	<b>1,027</b>	<b>25</b>	<b>75</b>	<b>100</b>

Figure 7: The percentage of students expressing some interest in a child psychiatry career organized by their primary college major



**Table T: Topics in child psychiatry about which medical students would like to learn more.**

<b>Students who answered “Yes” or “Maybe” to the question “Are you still considering a career in child and adolescent psychiatry?” were asked to pick one topic about which they could learn more.</b> (% of students choosing each answer)		
	Fellows n=66	Non-Fellows n=185
Child Development	36	31
Neurology in Child Psychiatry	21	21
Psychopharmacology	17	8
Psychopathology	12	21
Genetics in Child Psychiatry	11	12
Other	3	6
Total	100	100

**Table U: Elements that students recommend be emphasized when recruiting medical students to join the KTGF Fellowship in the future.**

<b>What element of the Fellowship do you think should be emphasized when recruiting medical students in the future? (N=68)</b>	
Clinical experiences	44
Mentoring relationship	29
Overall learning experience	21
Productive Fellowship meetings	3
Other (please specify)	3

**Table V: Comments and statistics from participating schools showing that the KTGF Fellowship is affecting career decisions among medical students.**

**KTGF Fellowship Sites: Success Stories**

**University of Vermont (KTGF Fellowship established in 2007):** 7 out of 82 medical school graduates are pursuing psychiatry this year and 3 of the 7 are planning to subspecialize in child psychiatry. This represents a substantial increase compared to the graduating classes of 2002 to 2007, when 1 to 4 students (median = 3) matched in a psychiatry residency program. It is unclear if the jump is due to KTGF funding, since the current residency training director has already been leading a push in getting students involved early in their undergraduate years. The KTGF funding has allowed the medical school to strengthen and formalize a program designed to generate more interest in child psychiatry.

**Johns Hopkins (KTGF Fellowship established in 2005):** In 2008, 4 students matched in a psychiatry residency and 2 students matched in a five-year program integrating adult and child psychiatry. 3 of the 6 psychiatry-directed graduates were part of the KTGF Fellowship and plan to subspecialize in child psychiatry. Last year, 7 students matched in psychiatry and 1 student joined a program combining family medicine and psychiatry. At least 1 student in the class of 2009 is a KTGF Fellow planning to specialize in psychiatry.

**U.C. Davis (KTGF Fellowship established in 2005):** We have also experienced a big jump in graduating students entering psychiatry this year. In the graduating class of 2008, we have 10 students out of 91 (about 11%) who matched into Psychiatry compared to the graduating class of 2007, in which we had only 5 students out of 84 (about 6%) that matched into Psychiatry. The Klingenstein program here started in January of 2005. In our first, year we enrolled both first and second year students in the middle of their respective years (classes of 2007 and 2008). The second year students started their third year during the fellowship and most of them faded out of the program at that time. Since then we have exclusively recruited from the first year class. Therefore the first class of Klingenstein fellows who began in their first year of medical school and actively completed the program was the graduating class of 2008. I would like to think this explains the doubling of students going into psychiatry in 2008 but should also note that UCDavis historically has had a fairly high percentage of graduating students entering psychiatry and 2007 was an unusually low year. In fact in the recent Psychiatric News the percentage of students entering into psychiatry from UCDavis was quoted as 12% in the 2006-2007 resident census.

**Mt. Sinai (KTGF Fellowship established in 2005):** The average size of the graduating class is about 120 students. Here is a summary outlining the census of students training in psychiatry from each graduating class:

- 2008: 7 students (including 1 in a combined psychiatry/neurology program)
- 2007: 10 students (including 1 student in a triple board program combining pediatrics, adult psychiatry and child psychiatry)
- 2006: 6 students
- 2005: 14 students (including 1 student in a triple board program)
- 2004: 9 students (including 1 student in a combined psychiatry/neurology program)
- 2003: 7 students

**Yale (KTGF Fellowship established in 2002):** The number of students matching in a psychiatry residency showed a marked increase, rising to 10 students in 2008 compared to 3 in 2007 and 4 in 2006. In fact, Yale's class of 2008 includes the largest number of future psychiatrists in the last 10 years; the 10-year average, including 2008, is about 5 students per class. Although the direct impact of the KTGF Fellowship is difficult to measure, it likely contributed to the rise as did the activities of the Yale Medical Student Psychiatry Association. 4 of the 10 students who matched in psychiatry in 2008 have indicated a commitment to pursue a child psychiatry fellowship after completing training in adult psychiatry. While the rise in psychiatry interest is certainly impressive, the personal stories hidden behind the statistics are likely more telling of the impact of the KTGF Fellowship. For example, Argo Caminis, a Fellow who matched in psychiatry this year, credits the Fellowship with influencing her final decision. Ms. Caminis participated in the Fellowship during her entire time at Yale, nurturing strong mentoring relationships and publishing a paper in child psychiatry. Her ties to the Yale Child Study Center ultimately helped her decide on psychiatry over a career in pediatrics. Similarly, Eric Arzubi was a 5-year member of the KTGF Fellowship, an experience he credits with helping him decide on a career in child psychiatry. His mentors, Dr. James Leckman and Dr. Andres Martin, helped him craft a vision for a future in child psychiatry and provided a lot of personal and professional support throughout his time at Yale. He is certain that he would not have been committed to a career in child psychiatry without the relationships sparked by participating in the KTGF Fellowship.

**Table W: Limitations and Proposed Remedies for this Study**

Limitations	Proposed Remedy
Cross-sectional study limits the ability to measure changes in medical students over time.	Longitudinal study using a controlled, randomized approach including schools with and without a KTGF Fellowship.
The questions included in the survey were not uniformly scaled nor did all questions provide an equal number of positive and negative answer choices.	Future surveys must use 5-point or 7-point Likert scales in as many questions as possible. The scales must be centered around a neutral answer choice with an equal number of positive and negative answer choices on either side.
The surveys collected information from students who were KTGF Fellows and from students who did not participate in the Fellowship.	Future studies should collect information from non-Fellows who informally attend Fellowship activities that are advertised school-wide.
The development and use of the survey instrument was limited to the field of child psychiatry.	The instrument should be modified so that it can be used to measure the effectiveness of interest groups and mentoring programs across medical disciplines.