Journal of Clinical Psychology in Medical Settings, Vol. 10, No. 3, September 2003 (© 2003)

Prescriptive Authority for Psychologists: Despite Deficits in Education and Knowledge?

William N. Robiner,[1,5] Diane L. Bearman,[1] Margit Berman,[1] William M. Grove,[2] Eduardo Colón,[3] Joann Armstrong,[1] Susan Mareck,[1] and Robert L. Tanenbaum[4]

As some psychologists advocate for prescription privileges, the need for closer analysis of the differences between psychologists and psychiatrists grows. Our data reveal key gaps in psychologists' training and significant limitations in their knowledge pertaining to prescribing relative to psychiatrists. Attitudes toward prescribing and estimates of psychologists' competence in prescribing are presented. The authors believe that psychologists' deficits in training and pertinent knowledge constitute major hurdles to competent prescribing. Caution is warranted about expanding psychologists' scope of practice to include prescribing.

KEY WORDS: prescription privileges; psychologist; medication; prescriptive authority; psychopharmacology; education; training.

INTRODUCTION

The movement for psychologists to secure prescriptive authority has gained considerable momentum and resources within the American Psychological Association (APA) despite a number of concerns about its potential adverse impact on patients and the field (see Adams & Bieliauskas, 1994a, 1994b; Albee, 2002; Bieliauskas, 1992a, 1992b; Brandsma & Frey, 1986; Bush, 2002a, 2002b; Bütz, 1994; D'Afflitti, 1991; DeNelsky, 1991, 1996, Gutierrez & Silk, 1998; Hayes & Chang, 2002; Hayes & Heiby, 1996, 1998; Hayes, Walser, & Bach, 2002; Heiby, 1998, 2002a, 2002b, 2002c; Kennedy, 1998; Kingsbury, 1992; Kovacs, 1988; May & Belsky, 1992; Moyer, 1995; Pies, 1991; Robiner et al., 2002; Seime, 1996; Wagner, 2002). A recent meta-analysis of 17 opinion surveys of psychologists and psychology trainees revealed minimal consensus and differing opinions regarding the pursuit of prescription privileges (Walters, 2001).

The original APA Report of the Ad Hoc Task Force on Psychopharmacology (APA, 1992) identified three possible levels for increasing psychologists' understanding of psychopharmacology: Level 1—Basic Psychopharmacology Education; Level 2—Collaborative Practice; and Level 3—Prescription Privileges. The highest of these levels of training, intending to train psychologists to prescribe, subsequently became the focus of APA's psychopharmacology objectives, as outlined in the APA Council of Representatives (APA CoR, 1996) recommendations for postdoctoral training in psychopharmacology for prescription privileges and APA (1996) model legislation for prescriptive authority. The APA Task Force did not advocate this option as being preferable over the other levels of training, but it did conceptualize training for prescription privileges as requiring the "necessary science background." The Task Force specified that such training would have prerequisites of several undergraduate courses (e.g., biology, chemistry) which are part of the standard premedical curriculum. Since then, these prerequisites have been relaxed considerably (APA, 1996; APA CoR, 1996) though, or perhaps because, it became evident

[1]University of Minnesota Medical School, Minneapolis, Minnesota.
[2]University of Minnesota, Minneapolis, Minnesota.
[3]Hennepin County Medical Center, Minneapolis, Minnesota.
[4]Private Practice, Philadelphia, Pennsylvania.
[5]Correspondence should be addressed to William N. Robiner, PhD, ABPP, Health Psychology, University of Minnesota Medical School, Mayo Mail Code 295, 420 Delaware Street, Southeast, Minneapolis, Minnesota 55455-0392; e-mail: robin005@umn.edu.

1068-9583/03/0900-0211/0 © 2003 Plenum Publishing Corporation

that few psychologists actually have obtained the academic prerequisites for psychopharmacology training envisioned by the Task Force (Tatman, Peters, Greene, & Bongar, 1997). Currently, the APA (APA CoR, 1996) recommends 300 hr of instruction and supervision of 100 patients beyond the doctoral degree. The current APA model for training psychologists comprises essentially no undergraduate prerequisites, substantially less didactics (i.e., years less) than physicians and other prescribers complete, and limited supervised practical training with remarkably little guidance as to how the practical experience is organized.

The Association of State and Provincial Psychology Boards (ASPPB, 2001) neither endorses nor opposes prescription privileges for psychologists. Recent legislation in New Mexico and Guam is designed to permit psychologists who have undertaken additional training to prescribe. The New Mexico law requires more education and both jurisdictions require more explicit requirements for the supervised experiences than the APA advocated when seeking independent prescriptive authority.

Thus far, there is a paucity of empirically derived information related to psychologists' readiness to prescribe. One of the most noted sources of information is the Department of Defense Psychopharmacology Demonstration Project (PDP), whose results were summarized in the Final Report of the American College of Neuropsychopharmacology (1998). That demonstration was limited to only 10 psychologists trained in a military medical school and teaching hospitals. Although proponents of prescriptive authority perceive the PDP as a successful pilot, the final report documents a range of outcomes, including both the favorable assessments of graduates in some areas and limitations of their training, practice, and skills. The report also questions the generalizability of the results of the PDP beyond its few graduates and the environment of organized military medical services to potentially much larger numbers of psychologists trained in environments about which little is known. In other words, it is uncertain how clearly the DoD program would predict the performance of psychologists trained in other settings (i.e., generally neither medical schools nor teaching hospitals).

In this paper, we contrast psychologists' and psychiatrists' training in biological and physical sciences, knowledge of domains fundamental to prescribing, and attitudes toward psychologists' prescribing. The presumed linkage between quality of care in prescribing and clinicians' training and mastery of relevant knowledge domains and acquisition of multiple skill sets makes it critical to examine these parameters closely. Our related paper (Robiner et al., 2002) provides a more comprehensive critique of the current training model for psychologist prescribing, addressing training, accreditation, and regulatory issues, as well as some of the justifications that proponents articulate in lobbying for the prescriptive authority agenda.

Aims

Our focus in this paper is on several issues. First, how do psychologists and psychiatrists differ in terms of graduate and undergraduate education in the biological and physical sciences relevant to prescribing? Second, how extensive is psychologists' knowledge related to prescribing psychoactive medications and how does it compare with psychiatrists' knowledge? Third, how do selected factors affect psychopharmacology knowledge? Lastly, how do psychologists and psychiatrists view psychologists' interest in obtaining prescriptive authority?

METHOD

Participants

Doctoral-level psychologists ($n = 49$) were recruited to complete surveys at the annual meetings of the Minnesota Psychological Association and the Pennsylvania Psychological Association in 1991. A majority of psychologists had completed APA-accredited doctoral programs (63%) and APA-accredited internships (53%). About half were trained in clinical psychology, a fifth had counseling degrees, and the remainder had training in other applied professional areas (e.g., educational, school) that can serve as the basis for psychology licensure. Their degrees included PhD (69%), EdD (12%), and PsyD (4%).

Psychiatric residents ($n = 20$) at the University of Minnesota Medical School and Hennepin County Medical Center were solicited at weekly meetings for psychiatric residents during which they typically discussed training and professional issues. Residents were at least at the G3 level. Data were collected from a few cohorts of psychiatric residents between 1991 and 1993, with a small number of additional residents surveyed in 1996 to increase the sample size.

The psychologists were older ($M = 47$ years) than the psychiatric residents ($M = 35$ years). The psychologists were mostly men (71%). Residents were mostly women (60%). Both groups were primarily from urban or suburban settings, although more psychologists (29%) than residents (5%) lived in rural areas. Survey administration was supervised by one of the investigators or their designees to ensure that participants' responses were entirely their own and that reference materials were not available. Written informed consent approved by the University of Minnesota Committee on the Use of Human Subjects in Research was obtained prior to survey administration.

Measures

Measures were developed (by WR, EC, and JA) for this study to assess educational backgrounds, knowledge related to psychopharmacology, readings related to prescribing, and attitudes about psychologist prescriptive authority. Parallel forms were created differing only in questions for the psychologists about their personal intentions regarding prescriptive authority. Surveys generally took less than 1 hr to complete. Pharmacology responses were scored by a board-certified psychiatrist (EC) and reviewed by other authors for consistency.

The survey assessing knowledge of psychopharmacology and related medical information had four sections. The first comprised a list of 58 side effects, toxic effects, and contraindications associated with common psychopharmacologic agents (from agranulocytosis to urticaria). The list was derived from the Physicians Desk Reference for benzodiazepines, antidepressants, antipsychotics, and mood stabilizers. In this section participants described symptoms or conditions and how they were diagnosed to indicate their awareness and understanding of medical risks that attend prescribing. The second section consisted of five drug-related clinical conditions (e.g., neuroleptic malignant syndrome, anticholinergic effects) associated with psychoactive medications that respondents were requested to describe and for which they were to delineate symptoms. The third section listed 13 types of medications, both psychoactive and nonpsychoactive classes, that have interactions with psychoactive medications. For each medication class, respondents were requested to name up to four medications (either generic or product name) to provide an index of gross familiarity with the other types of agents that can affect prescribing of psychoactive agents. The fourth section was a 25-item psychopharmacology quiz based on a posttest for medical students' psychiatric rotation at the University of Minnesota Medical School.

Statistical Analyses

Data analysis comprised independent-sample t tests, for which equal variance was not assumed, and linear regression.

RESULTS

Educational Background

Psychologists' and psychiatric residents' undergraduate majors differ significantly ($\chi^2 = 18.5$; $p < .001$). As evident in Table I, most psychologists (78.6%) had undergraduate social sciences majors; few had physical science majors. By contrast, two thirds of the psychiatric residents had biological and physical science majors. Psychiatric residents reported considerably greater course work than did psychologists in terms of premedical and medical school curriculum ($t = 14.7$; $p < .007$). Psychiatric residents nearly universally indicated they had taken at least one course (either undergraduate or graduate) in most of 13 areas typical of a premedical or medical school curriculum ($M = 12$ courses): anatomy, neuroanatomy, biochemistry, biology, chemistry, microbiology, math, calculus, pharmacology, physics (with a lab), physiology, neurophysiology, or zoology (see Table II). Psychologists' backgrounds in these areas were more limited ($M = 4.7$ courses). Fewer than half the psychologists had courses in anatomy, biochemistry, microbiology, pharmacology, physics, physiology, or zoology. Ten percent reported course work in a single area; 24% in 2–3 areas; 24% in 4 areas; 22% in 5–6 areas; 15% in 7–9 areas; and only 5% in greater than 9 areas (i.e., approximating medical school prerequisites).

Table I. Undergraduate Majors of Psychologists and Psychiatrists

Area of major	Psychologists	Psychiatrists
Physical sciences	12%	67%
Social sciences	79%	28%
Humanities	7%	6%
Arts	2%	0%

Table II. Psychologists' and Psychiatrists' Scientific Course Work Relevant to Prescribing

Course Work	Psychologists	Psychiatrists
Anatomy or neuroanatomy	41.5%	100.0%
Biochemistry	14.6%	100.0%
Biology	65.9%	100.0%
Chemistry	58.5%	100.0%
Microbiology	7.3%	100.0%
Mathematics	85.4%	100.0%
Pharmacology	17.1%	100.0%
Physics (with lab)	48.8%	95.0%
Physiology or neurophysiology	43.9%	94.4%
Zoology	22.0%	60.0%

Note. For psychiatrists, presumably course work < 100% represents, in part, the training of foreign medical graduates. Items did not clarify how many courses were taken within each area, nor specify whether courses were at the undergraduate or graduate level.

Knowledge of Psychopharmacology and Related Medical Information

Psychologists and psychiatrists agreed with the APA Task Force (APA, 1992; Smyer et al., 1993) that an adequate scientific foundation is very important in prescribing. Consistent differences were evident between psychiatric residents' and psychologists' familiarity with knowledge domains required for prescribing (see Table III). Psychiatric residents outperformed psychologists significantly ($p \leq .001$) on *all* four of the psychopharmacology indices, scoring more than twice or thrice higher on them.

In absolute terms, psychologists generally performed quite poorly on indices of knowledge and understanding of psychopharmacology and the medical information pertinent to prescribing. More specifically, psychologists obtained mean scores of 30% in the knowledge of adverse drug effects and contraindications, 29% in the knowledge of drug-related clinical syndromes; 31% in recognizing psychoactive and other medications with which they interact, and 36% on the psychopharmacology quiz. Psychiatrists obtained mean scores of 92, 96, 78, and 80% respectively on these measures.

In addition, a composite (i.e., total percent correct) score was derived to contend conservatively with missing data. The composite score was calculated for each participant by dividing the sum of his or her scores on the tests completed by the sum of the total possible scores for the tests completed, resulting in a score representing the proportion correct of completed items. Psychologists' mean composite was less than a third correct ($M = 31\%$; $t = -17.25$; $p < .001$). Psychiatric residents' fairly high composite scores ($M = 87\%$ correct) contrasted boldly with the psychologists' performance. Overall, psychologists generally performed poorly on indices of knowledge and understanding of psychopharmacology and the medical information pertinent to prescribing.

Reading About Psychopharmacology

Psychologists reported reading significantly less than psychiatric residents about psychopharmacology in terms of psychopharmacology books, paper on psychopharmacology in medical journals, and papers on psychopharmacology in psychiatric journals they had read in the past year (see Table IV). Psychiatric residents estimated reading more than eight times the number of papers and more than six times as much from psychopharmacology books than psychologists estimated having read. The groups did not differ significantly in terms of papers read about psychological (i.e., nonpharmacological) interventions. Psychiatrists reported significantly greater *understanding* of papers about psychoactive medications than did psychologists ($t = 4.8$; $p < .001$). Psychologists believed that most psychologists had

Table III. Psychologists' and Psychiatrists' Knowledge of Psychopharmacology and Medical Information Related to Prescribing

	Psychologists				Psychiatrists				
Domain	Mean	*SD*	Range	*n*	Mean	*SD*	Range	*n*	*t*-Test[a]
Adverse effects and contraindications (maximum = 116)	34.8	20.8	0–83	39	106.4	14.9	58–116	20	−15.17
Drug-related clinical syndromes (maximum = 10)	2.9	1.9	0–7	30	9.6	1.1	6–10	19	−15.46
Medications identification (maximum = 52)	16.1	7.5	4–32	35	40.8	5.2	31–52	19	−14.19
Psychopharmacology exam (maximum = 25)	8.9	4.8	0–19	39	20.4	3.1	14–25	20	−10.97
Total percent correct[b]	31%	16%	0–63%	39	87%	9%	60–99%	20	−17.25

[a] All *t* tests are independent samples without assuming equal variance; $p < .001$.

[b] Calculated as the sum of all raw scores divided by the sum of the highest possible score on each test. Total percent correct scores for participants who did not complete all of the tests were derived by dividing the sum of the scores on their completed tests by the sum of the highest possible scores on those tests only. All other scores reported in table are raw scores.

Table IV. Psychologists' and Psychiatrists' Estimates of Reading Related to Psychopharmacology and Psychological Interventions in the Past Year

Estimate	Psychologists' mean[a]	Psychiatrists' mean[b]	t	p
No. of books about psychopharmacology	0.35	2.25	−4.75[c]	<.001
No. of articles about choosing and using psychoactive medications	7.55	63.47	−3.7[c]	<.01
No. of articles in a psychiatric journal about psychoactive medications	4.30	81.16	−3.00[c]	<.01
No. of articles in a medical journal about psychoactive medications	4.17	17.11	−2.20[c]	<.05
No. of articles about psychological intervention	32.39	21.70	0.98[d]	*ns*

[a]Sample size range = 40–42.
[b]Sample size range = 19–20.
[c]Independent sample without assuming equal variance.
[d]Independent sample, equal variance assumed.

relatively limited understanding of papers about psychoactive medications. While both psychiatrists and psychologists recognized that prescription privileges would require psychologists to read more psychopharmacology papers annually, psychiatrists estimated significantly more ($M = 53$ articles, $t = 3.1$, $p < .003$) than psychologists estimated. This may suggest a relative underestimate by psychologists of some of the complexities inherent in prescribing that psychiatrists believe are important to keep abreast of through relatively extensive, ongoing reading.

Effects of Education, Reading, and Knowledge of Psychopharmacology-Related Issues

The degree to which knowledge scores could be predicted from reported course work background and reported reading patterns was analyzed by multiple linear regression (see Table V for regression coefficient). Because of the relatively small number of subjects, rather than compute regressions for all scores, we focused only on the composite score. We first examined the ability of reported reading patterns to predict this score among all respondents, and found that only "psychopharmacology books read in last year" was a significant ($p \leq .001$) predictor. We then examined reported course work as predictors, and found that three courses were significant predictors: anatomy, neuroanatomy, and microbiology.

Table V. Multiple Linear Regression of Knowledge Scores on Psychopharmacology Reading and Course Work

Predictor	Regression coefficient of composite score	p
Psychopharmacology books read last year	0.227	<.001
Anatomy course	−0.373	<.05
Neuroanatomy course	−0.150	<.05
Microbiology course	−0.327	<.01

We then checked whether these variables remained significant predictors once education (i.e., medical school vs. graduate school) was also included as a predictor. None did (coefficients and significance levels not shown). Hence, it is likely that these undergraduate courses work as predictors of psychopharmacology knowledge because they are simply acting as proxies for the more important variable: *Having attended medical school.* The same might possibly be said of the predictive value of reported book reading with this sample. However, this conjecture is less plausible because it confounds common sense; even with medical training, the physicians who read more psychopharmacology books would presumably gain increased knowledge of psychopharmacology.

Estimates of Prescribing Competence

Table VI presents respondents' estimates of the percentage of competent prescribers for selected types of practitioners. This included psychologists with three hypothetical lengths of training (but did not specify whether each year was full-time or part-time). Psychologists estimated that 40.3–64.6% of psychologists would prescribe competently on the basis of training of 1 to ≥2 years respectively. Psychiatric residents' rated few psychologists as competent to prescribe after the three specified lengths of proposed training, with a low of 5.8% for 1 year and high of 19.5% for more than 2 years of training.

Both psychiatric residents and psychologists rated majorities of psychiatrists as competent to prescribe, but minorities of nonpsychiatric physicians as competent in prescribing psychoactive medications. Unfortunately, the basis for these judgments was not assessed, nor were there queries about the effects of psychologist-physician collaborations in prescribing.

Table VI. Estimates of Practitioner Competence at Prescribing Psychoactive Medications

Estimate	Psychologists Mean	*SD*	Range	*n*	Psychiatrists Mean	SD	Range	*n*	t^a	*p*
What percentage of psychologists would prescribe competently with										
1 year of training	40.3%	31.7%	0–99%	30	5.8%	9.2%	0–25%	15	5.48	<.001
2 years of training?	57.8%	35.5%	0–100%	30	15.0%	17.8%	0–60%	16	5.24	<.001
>2 years of training?	64.6%	37.3%	0–100%	29	19.5%	20.3%	0–50%	11	4.74	<.001
What percentage of psychiatrists prescribe competently	71.4%	19.0%	20–98%	34	80.2%	14.2%	50–98%	18	−2.41	<.02
What percentage of nonpsychiatrist physicians prescribe competently	43.1%	27.1%	5–85%	31	29.2%	23.3%	0–80%	15	1.93[b]	*ns*

[a]based on *t* tests without assuming equal variance.
[b]based on *t* test assuming equal variance.

Also, it should be noted that these data were collected before the effects of national efforts to enhance nonpsychiatric physicians' prescribing of psychoactive medications were recognized.[6]

Psychologists' Views on Prescription Privileges for Psychologists

Table VII reveals psychologists' heterogeneous attitudes about and interest in obtaining prescription privileges. Clearly, psychologists were divided. About half of the psychologists opposed prescriptive authority for psychologists and the APA's efforts to lobby for it. Similarly, about half were not inclined to seek prescriptive authority. About two thirds acknowledged that they were not ready to prescribe. One third thought that it was a good idea for psychologists to prescribe and that the APA should lobby for prescriptive authority. Fewer were interested in obtaining privileges or thought it likely they would seek privileges. Nontrivial minorities were neutral or undecided about these issues.

Psychologists' reported likelihood of seeking prescription privileges was modestly correlated with scores on one of the psychopharmacology knowledge measures, the psychopharmacology examination ($r = .41$, $p < .05$), and the overall composite score showed a trend toward correlation with this question ($r = .29$, $p < .08$). However, given the number of secondary correlational analyses undertaken, these findings may be artifactual. Psychologists' self-reported readiness to prescribe did not correlate with any knowledge measure or with the composite score.

DISCUSSION

Psychologists' academic preparation differs fundamentally from that of psychiatrists (as well as other physicians and other prescribers). More specifically, psychologists obtain less scientific and clinical training directly relevant to prescribing than do other disciplines that prescribe. Major differences exist in undergraduate preparation, graduate education and training, and supervised clinical experiences between psychology and psychiatry. This presumably contributes to differences in how psychologists and psychiatrists approach their clinical experiences (Kingsbury, 1987). The differences between psychologists and psychiatrists parallel differences between psychology and other health care professions that have prescriptive authority.

In addition to differences in course work, psychiatrists generally see many more patients over the course of their training than do psychologists. For example, Kingsbury (1987) estimated that he saw more patients in his 1st month of psychiatric residency training in a psychiatric emergency department than he saw throughout his entire graduate training in clinical psychology. Similarly, psychiatrists routinely see more patients during their residencies than psychologists would (i.e., ≤100) see in the clinical

[6]For example, the N.I.M.H. Depression/Awareness, Recognition and Treatment (D/ART), the National Public Education Campaign on Clinical Depression, and the dissemination of practice guidelines (American Psychiatric Association, 2000; Depression Guideline Panel, 1993a, 1993b) have been instituted. Collectively, they appear to have increased primary care practitioners' awareness of psychological issues and improved their assessment and pharmacologic treatment of psychiatric patients (Coyne, Fechner-Bates, & Schwenk, 1994; Hirschfeld et al., 1997; Simon & VonKorff, 1995; Williams et al., 1999).

Table VII. Psychologists' Attitudes About Prescription Privileges

Response	Is it a good idea for psychologists to prescribe?	Do you have an interest in obtaining prescription privileges?	How likely would you be to seek privileges?	How ready are you currently to prescribe?	Should the APA lobby for prescription privileges?
Negative	45.2%	52.4%	50.0%	64.3%	50.0%
Positive	33.3%	14.3%	28.6%	2.4%	32.5%
Undecided/neutral	21.4%	33.3%	21.4%	33.3%	17.5%

psychopharmacology training proposed for psychologists (APA CoR, 1996).

Our data confirm important gaps in psychologists' knowledge and training in the biological and physical sciences that other authors have described (Tatman et al., 1997) and illuminate additional limitations in their scientific backgrounds. We are perplexed by the reason why psychologists' relatively meager academic preparation in the biological and physical sciences is of such apparently little concern to some proponents of prescriptive privileges (Hanson et al., 1999). Although doctoral education in psychology is lengthy (often six predoctoral years plus an additional year of supervised postdegree work to achieve licensure; APA, 1992), most of psychologists' education and training, including their scientific training, is *not* directly related to specific domains that are fundamental to competent prescribing (Robiner et al., 2002). Consequently, psychologists' overall *length* of training in obtaining their doctorates, which is touted by proponents of prescriptive authority as contributing to their qualifications to prescribe, may be only peripherally related to their readiness to prescribe. Rather, the *focus* of their training in specific, relevant, scientific, and clinical areas is the primary issue in gauging their readiness to prescribe. The absolute and relative (e.g., to psychiatrists and other prescribers) deficiencies in doctoral-level psychologists' knowledge and proficiency in key scientific and clinical areas directly related to prescribing are legitimate concerns (e.g., see Kingsbury, 1992).

The limitations in psychologists' scientific training directly relevant to clinical psychopharmacology seem likely to be associated with psychologists' limited knowledge about psychoactive and other medications. Our data revealed psychologists' limited knowledge in domains fundamental to prescribing competently. This included contraindications for frequently prescribed psychoactive medications, adverse effects associated with psychoactive medications, drug-related syndromes, the ability to identify medications that patients may take concurrently with psychoactive medications, as well as overall knowledge of psychopharmacology.[7] Psychologists' knowledge of domains that are central to prescribing is uniformly less extensive than psychiatric residents'. Presumably, such limitations would compromise prescribing practices. It seems likely that the relative deficiencies noted in our sample of psychologists are related to those reported in the American College of Neuropsychopharmacology (1998) review of the PDP graduates, who were perceived as comparatively less strong medically and psychiatrically than psychiatrists, even after they obtained additional training in psychopharmacology.[8]

Given the potential adverse consequences for patients of psychotropic medications (Antonuccio, Danton, & DeNelsky, 1995; Klein, 1996; Piasecki, 1998; Popkin, Callies, & Mackenzie, 1985; Preskorn, 1999; Riddle et al., 1991; Rivas-Vazquez, Johnson, Blais, & Rey, 1999), adequate knowledge in these domains and proficiency in physical examination and related medical skills for managing medications are essential (Robiner et al., 2002). Psychologists' limitations in these areas seem likely to contribute to limited sophistication in prescribing and may pose risks of suboptimal pharmacologic management, in both absolute and relative terms (i.e., to other prescribers) if they prescribe. They may also have greater difficulty keeping up with advances in medications than prescribers with greater depth and breadth of medical knowledge.

Thus far, empirical data regarding psychologists' lack of readiness to prescribe have been largely missing from the debate about prescriptive authority. Prescribing psychotropic medications effectively and

[7] Although the psychometric properties of our measures of these domains have not been established, their face validity and the process through which they were derived suggests that they are clearly relevant to, and necessary for, competent prescribing.

[8] Even so, the PDP training may be more extensive than training that could be provided to psychologists outside of the PDP who wish to prescribe. This seems likely given that it is based on a more abbreviated curriculum than the PDP graduates underwent and less is known about the organization, structure, and quality of the clinical supervised experiences that psychologists would receive.

safely entails greater education and understanding than the simplistic matching of types of drugs to types of disorders (Moyer, 1995). Our finding highlights the importance of the APA Task Force's (APA, 1992) recognition that psychology "... must train its personnel to recognize the effects of psychotropic medications" (p. 6). The gaps identified in psychologists' knowledge underscore the need for more psychopharmacology training for professional psychologists as well as caution about their preparedness to prescribe. If psychologists' goal is to enhance others' prescribing through collaboration about medication selection and monitoring, or to prescribe (e.g., as competently as psychiatrists do), they appear to have a substantial way to go in shoring up their knowledge base and medically relevant proficiencies. The proposed training for psychologists in psychopharmacology (APA CoR, 1996) falls short of psychiatrists' training. We doubt that the gaps we identified (i.e., multiple undergraduate- and graduate-level courses; limited understanding of psychopharmacology and related domains) could be surmounted in the time frame proposed by the APA (i.e., 1 year of part-time study plus supervision of 100 patients for an unspecified period of time).

Ongoing Education and Reading

Prescriptive authority for psychologists would necessitate greater levels of targeted continuing education (Smyer et al., 1993) and more intensive, ongoing reading related to psychopharmacology and clinical medicine. Our data revealed that psychologists spend fairly little time reading about psychopharmacology, notably less than psychiatric residents. Strict continuing education requirements would be warranted to keep psychologists up-to-date with the burgeoning formulary of psychotropic and nonpsychotropic medications (with which they may interact) and to assist them in overcoming gaps associated with their condensed training. Such efforts may distract from their clinical activities as psychologists, and their reading and continuing education related to other aspects of their psychological practices (DeNelsky, 1991).

Attitudes About Prescriptive Authority

Our data corroborate trends noted earlier (Gutierrez & Silk, 1998; Massoth, McGrath, Bianchi, & Singer, 1990; Robiner, Koehler, & Wedding, 1998) that psychologists are divided about prescription privileges. The levels of support and opposition in our sample are comparable to some other surveys conducted around the same time, but suggest less support than Frederick/Schneiders' larger survey (Frederick/Schneiders, Inc., 1990). Our data suggest that psychologists' attitudes about prescriptive authority vary, in part on the basis of how much additional training psychologists would receive: the greater the training, the wider the support. Our sample of psychologists estimated that a majority of psychologists might be competent to prescribe after 2 years of training.

Unfortunately our survey did not specify whether 2 years of training would be part-time or full-time (e.g., akin to the early phase of the DoD project). Nor did we query whether that time period would cover basic scientific undergraduate prerequisites for training (i.e., that the APA Task Force recommended *before* training), or exclusively the psychopharmacology training itself after the prerequisites had been fulfilled. Given the limited hours of instruction, and the model for clinical psychopharmacology training programs to cater to practitioners who remain somewhat clinically active, the training is likely to fall short of the APA Task Force's recommendations, and of the full-time 2-year programs that some respondents to our survey (and other surveys) may presume when expressing attitudes related to psychologists prescribing.

The applied supervised training in psychopharmacology proposed for psychologists (APA CoR, 1996) lacks the intensity, breadth, and duration of psychiatric residency training. Furthermore, currently there are no mechanisms to accredit the psychopharmacology programs. Hence, psychologists' level of support reflected in surveys may be overstated because of presumptions that psychologists would receive more intensive training (i.e., two full-time years following completion of prerequisites) than they may in actuality, and may presume more intensive and well-organized supervised practical experiences in psychopharmacology than they may receive. Psychiatrists have relatively greater doubts that the proposed training would yield competent psychologist prescribers, corroborating concerns reported earlier (Klusman, 1998).

Limitations of This Study

The limitations to our study are self-evident. Comparisons of modest convenience samples of practicing psychologists with psychiatrists-in-training are

less preferable than larger samples of subjects at comparable stages in their careers. Our sample of psychologists was small, but notably, is larger than the PDP, about which much has been written in the psychology literature. Because the representativeness of our sample of psychologists and psychiatrists is not known, our data should be considered preliminary. Nevertheless, the highly significant differences across all domains between psychologists and psychiatric residents are quite compelling, especially in light of the limited sample size. We have no reason to believe that our sample was biased or that our results would be attributable to sampling problems. The delays[9] in analyzing our data caution that our findings may not accurately reflect current attitudes or levels of knowledge.

Another limitation was the lack of assessment of clinical proficiency related to prescribing (e.g., recognizing side effects, interpreting relevant laboratory data). There is little reason to believe that psychologists would have done well on such assessments, given the historic lack of training in these areas within psychology graduate education.

A necessary limitation of our data is that we did not include any psychologists who had undergone psychopharmacology training akin to the PDP. Our data collection preceded the PDP. Ideally, future studies could compare psychologists who had undergone the three levels of training proposed by the APA Task Force with psychiatrists and other prescribers to see how much training is necessary to make them more comparable in terms of their performance on objective measures of psychopharmacology and related medical knowledge. Similarly, analyses of their respective clinical proficiencies related to medication management (e.g., clinical examination, interpretation of laboratory data) would elucidate comparisons that better inform the dialogue about prescriptive authority for psychologists. Such analyses would be meaningful to potential consumers and third-party payers, and provide an empirical basis to developing training models, curricula, and regulatory oversight of psychologists' prescriptive privileges.

[9]The delay in analyzing the data and preparing the manuscript were due principally to the time constraints related to the authors' other professional activities and the absence of external funding. There were no conflicts of interest that potentially might have compromised the integrity of the study or the interpretation of results. The developments within the prescriptive agenda movement, since the data were collected, render this project timely and increasingly relevant as a matter of policy.

CONCLUSIONS

Increased collaboration between psychologists and health professionals who currently prescribe appears to be a more prudent means of enhancing mental health services than psychologists' pursuit of prescription privileges. The results of our survey reveal significant disparities between psychologists and psychiatrists in terms of their education and knowledge related to psychopharmacology. Our results complement earlier reports about psychologists' limited training in the physical sciences (e.g., Tatman et al., 1997). Psychologists' relative limitations in training in the physical sciences and diverse medical areas are essential in considering their preparation for prescribing and, arguably, for undertaking further training to prescribe. We believe it would be counterproductive to trivialize these discrepancies in light of the importance of practitioners' scientific foundation and clinical proficiencies in prescribing currently and in being prepared to understand and integrate the advances in pharmacotherapy that are likely to guide future prescribing practices.

Psychologists' absolute and relative deficits in education and knowledge constitute hurdles to being able to prescribe competently. We question whether these gaps are likely to be surmounted sufficiently through abbreviated training programs, even those meeting the APA-recommended criteria (APA CoR, 1996). Unless the deficiencies in psychologists' training for the pharmacologic management of mental health problems are appropriately remedied (i.e., they are trained up to the level of other prescribers or substantially closer to it), the quality of psychopharmacologic care rendered to patients could be compromised and should not be presumed to be equivalent to that provided by other prescribers, especially psychiatrists. The conundrum inherent in psychologists' prescribing is that by not knowing what they do not know, they may unwittingly expose their patients to needless risks or suboptimal care. No matter the worthy intentions of psychologists who may seek prescriptive authority, and regardless of their strong competencies in their other clinical endeavors, the inadequacies in their preparation to prescribe pose risks that they could inadvertently harm the very patients they seek to help by prescribing.

Such risks could be eliminated by pursuing the APA Task Forces' Level-2 (collaborative practice) rather than Level-3 (prescription privileges). Such risks could be minimized to some degree by (a) increasing the biological and physical science

prerequisites for entry into doctoral-level graduate programs in psychology and related course work within doctoral programs; (b) restoring the biological and physical science undergraduate prerequisites to the requirements for the training of psychologists in clinical psychopharmacology who wish to prescribe; (c) developing clearer and clinically relevant guidelines than currently exist about the supervised practice of psychologists as they undergo applied, supervised training to prescribe (i.e., specifying minimum number of sessions per patient to manage medications, diversity of medical and mental health patients seen, minimal range of medications used, etc.); (d) developing stringent accreditation criteria and mechanisms for overseeing clinical psychopharmacology training programs, including their supervised practical experiences (e.g., qualifications of supervisors); and (e) conducting further research about training that could prepare psychologists to prescribe competently outside of the military with a broad range of patient populations (e.g., including the elderly, children, the medically ill, and the serious and persistently mentally ill).

In addition, risks could be reduced by (a) limiting prescribing to *dependent authority* (i.e., requiring medical supervision) with *limited formularies*; (b) developing a national database of critical incidents and signal events related to psychologist prescribing to track potential problems; (c) developing regulatory mechanisms (i.e., statutes, rules, and regulations) that appropriately address aspects of professional practice currently addressed in the regulation of current prescribers (e.g., physicians); and (d) allocating sufficient resources for regulatory boards to develop the necessary expertise for evaluating and monitoring psychologists' prescribing practices (e.g., expanding boards to include physicians or psychiatrists). These and other measures could ameliorate, at least in part, the potential effects of psychologists' limitations in education and knowledge relevant to prescribing, and lessen the risks for patients associated with psychologists' prescribing and other expanded activities related to medications.

ACKNOWLEDGMENTS

The authors gratefully acknowledge the editorial guidance and substantive contributions of William Schofield, PhD, and Irving I. Gottesman, PhD, as well as the contributions of Elaine Heiby, PhD, in the preparation of this paper.

REFERENCES

Adams, K. M., & Bieliauskas, L. A. (1994a). Could versus should: A reply to Sammons. *Journal of Clinical Psychology in Medical Settings, 1,* 209–215.

Adams, K. M., & Bieliauskas, L. A. (1994b). On perhaps becoming what you had previously despised: Psychologists as prescribers of medication. *Journal of Clinical Psychology in Medical Settings, 1,* 189–197.

Albee, G. W. (2002). Just say no to psychotropic drugs! *Journal of Clinical Psychology, 58,* 635–648.

American College of Neuropsychopharmacology. (1998, May). *Final report: DoD prescribing psychologists: External analysis, monitoring, and evaluation of the program and its participants.* Nashville, TN: Author.

American Psychiatric Association. (2000). Practice guideline for the treatment of patients with major depressive disorder (revision). *American Journal of Psychiatry, 157*(Suppl. 4), 1–45.

American Psychological Association. (1992). *Report of the ad hoc task force on psychopharmacology.* Washington, DC: Author.

American Psychological Association. (1996). *Model legislation for prescriptive authority.* Washington, DC: Author.

American Psychological Association, Council of Representatives (1996). *Recommended postdoctoral training in psychopharmacology for prescription privileges.* Washington, DC: Author.

Antonuccio, D. O., Danton, W. G., & DeNelsky, G. Y. (1995). Psychotherapy versus medication for depression: Challenging the conventional wisdom with data. *Professional Psychology: Research and Practice, 26,* 574–585.

Association of State and Provincial Psychology Boards. (2001). *Guidelines for prescriptive authority.* Montgomery, AL: Author.

Bieliauskas, L. A. (1992a). Prescription privileges for psychologists? Reality orientation for proponents. *Physical Medicine and Rehabilitation: State of the Art Reviews, 6,* 587–595.

Bieliauskas, L. A. (1992b). Rebuttal of Dr. Frank's position. *Physical Medicine and Rehabilitation: State of the Art Reviews, 6,* 584.

Brandsma, J. M., & Frey, J., III (1986). Caveats regarding psychologists' prescribing drugs. *Georgia Psychologist, 39,* 16–19.

Bush, J. W. (2002a). Prescribing privileges: Grail for some practitioners, potential calamity for interprofessional collaboration in mental health. *Journal of Clinical Psychology, 58,* 681–696.

Bush, J. W. (2002b). Prescription privileges: Comments on Robiner et al. *Clinical Psychology: Science and Practice, 9,* 443–447.

Bütz, M. R. (1994). Psychopharmacology: Psychology's Jurassic Park? *Psychotherapy, 31,* 692–699.

Coyne, J. C., Fechner-Bates, S., & Schwenk, T. L. (1994). Prevalence, nature, and comorbidity of depressive disorders in primary care. *General Hospital Psychiatry, 16,* 267–276.

D'Afflitti, J. P. (1991). Profoundly different professions: Commentary on prescribing privileges for psychologists. *Journal of Clinical Psychiatry, 52,* 11–12.

DeNelsky, G. Y. (1991). Prescription privileges for psychologists: The case against. *Professional Psychology: Research and Practice, 22,* 188–193.

DeNelsky, G. Y. (1996). The case against prescription privileges for psychologists. *American Psychologist, 51,* 207–212.

Depression Guideline Panel. (1993a, April). *Depression in primary care: Vol. 1. Detection and diagnosis. Clinical practice guideline, Number 5* (AHCPR Publication No. 93-0550). Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research.

Depression Guideline Panel. (1993b, April). *Depression in primary care: Vol. 2. Treatment of major depression, Clinical practice guideline, Number 5* (AHCPR Publication No. 93-0551). Rockville, MD: U.S. Department of Health and Human

Services, Public Health Service, Agency for Health Care Policy and Research.

Frederick/Schneiders, Inc. (1990, December). *Survey of American Psychological Association members*. Washington, DC: Author.

Gutierrez, P. M., & Silk, K. R. (1998). Prescription privileges for psychologists: A review of the psychological literature. *Professional Psychology: Research and Practice, 29,* 213–222.

Hanson, K. M., Louie, C. E., Van Male, L. M., Pugh, A. O., Karl, C., Muhlenbrook, L., et al. (1999). Involving the future: The need to consider the views of psychologists-in-training regarding prescription privileges for psychologists. *Professional Psychology: Research and Practice, 30,* 203–208.

Hayes, S. C., & Chang, G. (2002). Invasion of the body snatchers: Prescription privileges, professional schools, and the drive to create a new behavioral health profession. *Clinical Psychology: Science and Practice, 9,* 264–269.

Hayes, S. C., & Heiby, E. (1996). Psychology's drug problem: Do we need a fix or should we just say no? *American Psychologist, 51,* 198–206.

Hayes, S. C., & Heiby, E. M. (Eds.). (1998). *Prescription privileges for psychologists: A critical appraisal*. Reno, NV: Context Press.

Hayes, S. C., Walser, R., & Bach, P. (2002). Prescription privileges for psychologists: Constituencies and conflicts. *Journal of Clinical Psychology, 58,* 697–708.

Heiby, E. M. (1998). The case against prescription privileges for psychologists: An overview. In S. C. Hayes & E. M. Heiby (Eds.), *Prescription privileges for psychologists: A critical appraisal* (pp. 51–78). Reno, NV: Context Press.

Heiby, E. M. (2002a). Prescription privileges for psychologists: Can differing views be reconciled? *Journal of Clinical Psychology, 58,* 589–597.

Heiby, E. M. (2002b). Concluding remarks on the debate about prescription privileges for psychologists. *Journal of Clinical Psychology, 58,* 709–722.

Heiby, E. M. (2002c). It is time for a moratorium on legislation enabling prescription privileges for psychologists. *Clinical Psychology: Science and Practice, 9,* 256–263.

Hirschfeld, R. M., Keller, M. B., Panico, S., Arons, B. S., Barlow, D., Davidoff, F., et al. (1997). The National Depressive and Manic-Depressive Association consensus statement on the undertreatment of depression. *JAMA, 277,* 333–340.

Kennedy, J. (1998, April 3). Prescription privileges for psychologists: A view from the field. *Psychiatric News, 33*(7), 26.

Kingsbury, S. J. (1987). Cognitive differences between clinical psychologists and psychiatrists. *American Psychologist, 42,* 152–156.

Kingsbury, S. J. (1992). Some effects of prescribing privileges. *Professional Psychology: Research and Practice, 23,* 3–5.

Klein, R. (1996). Comments on expanding the clinical role of psychologists. *American Psychologist, 5,* 216–218.

Klusman, L. E. (1998). Military health care providers' views on prescribing privileges for psychologists. *Professional Psychology: Research and Practice, 29,* 223–229.

Kovacs, A. (1988). Shall we take drugs? Just say no. *Psychotherapy Bulletin, 23,* 8–11.

Massoth, N. A., McGrath, R. E., Bianchi, C., & Singer, J. (1990). Psychologists' attitudes toward prescription privileges. *Professional Psychology: Research and Practice, 21,* 147–149.

May, W. T., & Belsky, J. (1992). Response to "Prescription privileges: Psychology's next frontier?" or the siren call: Should psychologists medicate? *American Psychologist, 47,* 427.

Moyer, D. (1995). An opposing view on prescription privileges for psychologists. *Professional Psychology: Research and Practice, 26,* 586–590.

Piasecki, M. (1998). Antidepressant medications: A review of their potential for toxicity. In S. C. Hayes & E. M. Heiby (Eds.), *Prescription privileges for psychologists: A critical appraisal* (pp. 199–211). Reno, NV: Context Press.

Pies, R. W. (1991). The "deep structure" of clinical medicine and prescribing privileges for psychologists. *Journal of Clinical Psychiatry, 52,* 4–8.

Popkin, M. K., Callies, A. L., & Mackenzie, T. B. (1985). The outcome of antidepressant use in the medical ill. *Archives of General Psychiatry, 41,* 469–477.

Preskorn, S. H. (1999). *Outpatient management of depression: A guide for the practitioner* (2nd ed.). Caddo, OK: Professional Communications, Inc.

Riddle, M. A., Nelson, J. C., Kleinman, C. S., Rasmusson, A., Leckman, J. F., King, R. A., et al. (1991). Sudden death in children receiving Norpramin: A review of three reported cases and commentary. *Journal of the American Academy of Child and Adolescent Psychiatry, 30,* 104–108.

Rivas-Vazquez, R. A., Johnson, S. L., Blais, M. A., & Rey, G. J. (1999). Selective serotonin reuptake inhibitor discontinuation syndrome/understanding, recognition, and management for psychologists. *Professional Psychology: Research and Practice, 30,* 464–469.

Robiner, W. N., Bearman D. L., Berman, M., Grove, W., Colón, E., Armstrong, J., et al. (2002). Prescriptive authority for psychologists: A looming health hazard? *Clinical Psychology: Science and Practice, 9,* 231–248.

Robiner, W. N., Koehler, D., & Wedding, D. (1998). Contemporary issues in psychology: Survey results of the Association of Medical School Psychologists. *The Medical School Psychologist, 5*(1), 1, 7–12.

Seime, R. J. (1996). Let's say "no" to prescription privileges for psychologists. *West Virginia Journal of Psychological Research and Practice, 5,* 79–89.

Simon, G. E., & VonKorff, M. (1995). Recognition, management, and outcomes of depression in primary care. *Archives of Family Medicine, 4,* 99–105.

Smyer, M. A., Balster, R. L., Egli, D., Johnson, D. L., Kilbey, M. M., Leith, N. J., et al. (1993). Summary of the report of the Ad Hoc Task Force on Psychopharmacology of the American Psychological Association. *Professional Psychology: Research and Practice, 24,* 394–403.

Tatman, S. M., Peters, D. B., Greene, A. L., & Bongar, B. (1997). Graduate students' attitudes toward prescription privileges training. *Professional Psychology: Research and Practice, 28,* 515–517.

Wagner, M. K. (2002). The high cost of prescription privileges. *Journal of Clinical Psychology, 58,* 677–680.

Walters, G. D. (2001). A meta-analysis of opinion data on the prescription privilege debate. *Canadian Psychology, 42,* 119–125.

Williams, J. W., Jr., Rost, K., Dietrich, A. J., Ciotti, M. C., Zyzanski, S., & Cornell, J. (1999). Primary care physicians' approach to depressive disorders: Effects of physician specialty and practice structure. *Archives of Family Medicine, 8,* 58–67.