Training and Education in Professional Psychology

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Coursework, Instrument Exposure, and Perceived Competence in Psychological Assessment: A National Survey of Practices and Beliefs of Health Service Psychology Trainees

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Assessment is critical to health service psychology and represents a core area of coverage during doctoral training. Despite this, training practices in assessment are understudied. Accordingly, this study utilized a national sampling of students (n = 534) enrolled in an American Psychological Association–accredited health service psychology doctoral program with substantive training in clinical or counseling psychology. We asked trainees to rate their competency for instruments in which they had training. We examined trends in training experiences, including both theory-based education and applied clinical opportunities, and explored differences in instrument training trends across program type (PhD/PsyD) and program discipline (clinical/counseling). Results of this study suggest a general convergence with professional practice trends in terms of instrument coverage, less clinical training, and exposure compared with didactic methods and generally small differences across program type and discipline in perceived competence and instrument exposure. Implications for training and education in psychological assessment are discussed.

Public Significance Statement
This study examines assessment training patterns in health service psychology students using a nationally sampled and representative sample. The patterns of training coverage mirror the instrument use patterns of psychologists who are currently in clinical practice. Students receive more frequent didactic and classroom exposure during training than practice opportunities with clients. Future research will benefit from evaluating the differential impact of classroom and clinical training experiences on competency, both perceived and performance based.

Keywords: psychological assessment, competency, training, education

With a majority of practicing psychologists (58%) conducting some form of assessment as part of their practice (Norcross & Karpiak, 2012) and spending an average of 24% of their time on assessment-related activities (Wright et al., 2016), assessment is an

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inseparable part of the identity of the modern psychologist (Benjamin, 2005). Accordingly, coverage in assessment is required by the American Psychological Association's (APA) *Standards for Accreditation for Programs in Health Service Psychology* (HSP) as a core area of training in HSP doctoral programs (APA, 2018). However, explicit guidelines or stipulations on what should be taught, or how that training should be provided, are not outlined. This results in substantial variability in training structure (Childs & Eyde, 2002) utilizing various competency models to assess the progress of HSP trainees over the course of their training (e.g., Rodolfa et al., 2005). Recently the APA Board of Educational Affairs (BEA; APA BEA, 2020) approved the *Guidelines for Education and Training in Psychological Assessment in Health Service Psychology* with the purpose of ensuring quality education and practice of psychological assessment. These guidelines identify general practice and training standards across the domains of: (a) theory integration, (b) testing practice, (c) psychometrics of instruments and administrator qualifications, (d) test selection and use, (e) ethical and professional issues, (f) diversity considerations, and (g) supervision. Exemplifying the types of direction offered by the guidelines, the section on test selection and use notes that students should achieve accuracy in scoring and administration using appropriate and valid instruments. In the supervision domain, the guidelines note that supervisors should attain and maintain competency in psychological assessment. It also notes that trainee education should integrate coursework with practicum experiences because coursework and didactic courses reflect common, but distinct, methods of training in psychological assessment.

Despite efforts to shore up assessment practice and training (e.g., APA BEA, 2020; Cox, Cox, & Caplan, 2013; Guilmette, Hagan, & Giuliano, 2008), concerns persist over insufficient exposure to, and inadequate outcomes for, assessment training during doctoral programs (Cook, Hausman, Jensen-Doss, & Hawley, 2017), likely as a function of the dearth of research on explicit training practices to guide training programs (Kaslow & Egan, 2017; Smith, 2017). Likewise, internship directors report that trainee applicants are not sufficiently prepared in report writing (Ready, Santorelli, Lundquist, & Romano, 2016; Stedman, Hatch, & Schoenfeld, 2001, 2001), and there are also concerns over inadequate coverage of ethics and multiculturalism as they relate to assessment practice (Ready & Veague, 2014). Some specialty assessment practices also lack formal frameworks for evaluating competency or providing instruction for key foundational skills (Kaslow, Finklea, & Chan, 2018).

One way that training benchmarks may be evaluated is by ensuring they match professional practice trends. Staying up to date with emerging trends is important for not only students but also course instructors and clinical supervisors (e.g., APA BEA, 2020). Indeed, having training that matches practice trends is important because commonly utilized instruments are earmarked when considering how to incorporate psychological assessment into various evidence-based practices and settings (Hunsley & Mash, 2007). As such, there have been a variety of surveys on test instrument use within several specialty areas of professional practice, including forensic (Otto & Heilbrun, 2002) and neuropsychological (Wright et al., 2016) assessment. A lack of training in assessment has been linked with deficiencies in their use (Cook et al., 2017). Accordingly, knowledge of educational training trends provides a means through which standards of training may be developed and by which sufficiency of training programs may be evaluated (Ingram, Cribbet, & Schmidt, 2019). Research examining assessment training have typically utilized training directors, who report the aggregated educational exposure and performance competency typical of their program. Results have been informative in many ways. For instance, they have identified changes in assessment instrument popularity and training over time (Ready et al., 2014). They have also described differences between program types in educational design (e.g., that practitioner focused programs emphasize instruments that are less emphasized in more research-oriented training models; Mihura, Roy, & Graceffo, 2017).

In a departure from training director samples, Ingram et al. (2019) evaluated assessment education in personality a convenience sample of trainees from 16 clinical and counseling PhD programs. In general, training director and trainee report were largely similar with respect to instrument exposure frequency and coursework. Such similarity suggests a match between training coverage and clinical utilization. Likewise, neuropsychology coursework was increasingly common in both, likely because of its rise as a specialty (Norcross et al., 2012). Ingram et al. (2019) also found that the opportunity for supervised assessment practice was lower than theory-based learning. This discrepancy provides a potential barrier to the critically important integration of knowledge and skill-based competencies (Childs et al., 2002; Mihura et al., 2017) for assessment training outcomes (Callahan, 2015).

Despite providing a novel measurement of assessment training trends using HSP trainees, the study by Ingram et al. (2019) was limited in several ways. It included only PhD programs from 16 training programs and focused exclusively on personality measures. Likewise, previous studies on psychological assessment practices drawn from samples composed of training directors have excluded counseling psychology programs from their surveys (Mihura et al., 2017; Ready et al., 2014), despite them representing roughly a quarter of APA-accredited HSP programs. As such, a nationally sampled study of psychological assessment training in HSP doctoral programs is needed. To accomplish this goal, this study surveys students enrolled in an APA-approved HSP program to determine what instruments, experiences, and areas of study related to psychological assessment were covered during training. Specifically, we examine classroom and clinical-training exposure in psychological assessment instruments as well as perceived competency of trained instruments as an outcome metric associated with that training. Differences in trends are also examined between program type (PhD/PsyD) and training discipline (e.g., clinical/counseling), given that these factors are considered as part of professional development milestone placements (e.g., Association of Psychology Postdoctoral and Internship Centers [APPIC], 2018 allows internship training directors to indicate a preference for certain school or training type).

Method

Participants

Survey invitations were sent to training director(s) (TDs) at APA-accredited HSP programs that include substantive training in clinical or counseling psychology (including those listed as having combined-type programs (e.g., clinical-counseling). Programs

were considered for inclusion if they were located within the United States and listed as accredited on the APA website in January 2019 (American Psychological Association, 2018). Program survey invitations requested that TDs forward a recruitment e-mail to all currently enrolled students. Participants were provided with an opportunity to win one of 100 $25.00 gift cards to Amazon. An initial round of recruitment e-mails was sent to program TDs of eligible training programs in March 2019. After excluding programs who had confirmed distribution during the first recruitment wave, a second round of surveys was sent to TDs in July 2019. In addition, requests were made with the administrators of Division 12 (clinical) and Division 17 (counseling) listservs to distribute the survey invitation electronically.

In general, trainee respondents (n = 534) were 27.8 years old (SD = 3.9), identified as female (81.3%), and were White (80.1%). More trainees were enrolled in a clinical (75.8%) training program, rather than counseling (20.0%) or a combined type (4.1%) program. Response rates across program training models were generally consistent with the number of accredited programs listed on the APA website (APA, 2018; clinical = 71.8%, counseling = 22.9%, and combined-type programs = 4.3%) as well as with the number of individuals applying for internship reported in the 2018 APPIC survey data of registered internship applicants (APPIC, 2018; clinical = 78%, counseling = 13%, and combined type = 3%). Although representing only a small portion of potential participants, the response rate and retention of participants who started this survey exceed other recent nationally sampled studies of trainees using similar recruitment methods (for instance, see Swift, Christopherson, Bird, Zöld, & Goode, 2020).

The sample included trainees from all United States census regions; however, the West (n = 22) and Pacific regions (n = 0) provided fewer respondents than the Northeast (n = 141), Midwest (n = 174), or South (n = 187). Trainees were more likely from PhD (64.6%), rather than PsyD (34.6%), programs. However, program type is representative of national training program enrollment and are also consistent with those observed in the 2018 APPIC Match Survey (61% PhD, 39% PsyD). Most students reported being in not-for-profit universities (89.8%). Because of institutional review board requirements, we did not collect respondent program or school of attendance; however, payment information was collected from e-mails associated with individuals from approximately 70 different programs (~22% of the total number of programs in the United States and listed as accredited on the APA website at the time of the study). The remaining e-mails were from anonymous services. Thus, at least one quarter of programs in the country took part in this study. By our estimation, our sample comprises between 2% and 4% of the total population of HSP trainees. This estimation is based on the 2019 APPIC Survey match that included 3,847 individuals who registered for match. If the average program length prior to match entry is between 5 and 6 years (approximating APPIC match data), then there are roughly 19,200–23,000 trainees at the time of the survey (2.3–2.8% of which we sample). The actual percentage will vary as a function of individual program enrollment. Without enrollment numbers for all programs at the time of distribution, we are unable to calculate an actual return rate or the total trainee population

When asked to rank the training focus of their programs (on a scale of 0–100 where 0 = *practice focused*, 50 = *balance*, 100 = *research focused*), trainees indicated that their HSP programs were generally well balanced between these two components (M = 45.9, SD = 17.6). Detailed demographic information about trainee participants is presented in Table 1. Institutional review board requirements precluded forced responses in the survey, and individual items that had no information provided were left missing within total frequency totals (e.g., clinical programs had 26.4% with a BA/BS, 69.6% with an MA/MS, and 4.0% was left unanswered). Information on coursework and clinical experience is provided in Table 2. To ensure comparable frequencies between training exposure and perceived competence across the different instruments, participants were excluded listwise. There were 614 responses who started the survey (87.0% retained). Most of the excluded participants completed the demographics but provided no information on any instrument or coursework (n = 41; 51.3% of those excluded). In this study we report all survey questions related to training frequency and perceived competence.

Survey Instrument

The survey gathered demographic information about trainee respondents as well as information about the HSP doctoral program in which they are currently enrolled. The survey asked respondents about exposure to various assessment instruments and areas of assessment. Specifically, questions asked about the coursework topics that trainees had taken, instruments in which they had exposure to during formal coursework, and practicum assessment experience with different instruments. The assessment instruments identified for inclusion within the study mirror those examined on surveys of psychologists engaged in professional practice (Wright et al., 2016) and training director summaries of HSP doctoral opportunities (Mihura et al., 2017). Trainees then rated their perceived self-competence in each assessment instruments for which they indicated having received some form of graduate-level training (either formal program coursework or practicum training). Compared with other graduate students with a similar level of training, trainees described their competence using a scale from 0 to 100 with behavioral anchors set for 0 (*not at all competent*), 50 (*average competency*), and 100 (*extremely competent*). Trainees compared themselves with their peers, rather than evaluate progress toward professional benchmarks (e.g., ability to practice independently) because trainees are best able to compare themselves with experiences and individuals who are most similar to themselves. Comparisons with peers with whom the graduate trainees have regular contact (e.g., in class, as part of professional organizations, in program-shared practicums, etc.), and with whom they share the most similarity, provides a means through which to understand normative beliefs and perceived self-control. We did not ask trainees to judge their ability for independent practice or compare themselves with those practicing independently because we believe it was unlikely that they would have a good sense of what professional practice entails—a finding supported both by existing literature noting low preparedness for practice (Ready et al., 2016) and, subsequently, by the lower practice-based experiences of trainees in this study. Trainees also provided information about their clinical experiences for select APPIC-tracked criteria (e.g., number of integrated reports, number of semesters of practicum, assessment-only hours obtained to date).

Table 1
Demographic Information of Study Sample

Sample characteristic	Total (n = 534)	Program type: Clinical (n = 405)	Counseling (n = 107)	Combined (n = 22)	PhD (n = 345)	PsyD (n = 185)
Age (years)						
21–25	28.0%	30.4%	17.9%	31.8%	21.2%	40.5%
26–30	54.5%	53.4%	61.7%	40.8%	60.7%	42.7%
31–35	13.6%	12.9%	15.0%	22.6%	15.4%	10.9%
36+	3.9%	2.7%	4.5%	4.5%	2.7%	5.8%
Ethnicity						
White	80.1%	83.5%	71.0%	63.6%	78.8%	82.7%
African American	5.6%	3.5%	13.1%	9.1%	6.1%	4.9%
Hispanic/Latinx	2.2%	2.2%	2.8%	0.0%	1.4%	3.8%
Asian American	5.8%	4.7%	7.5%	18.2%	7.5%	2.7%
Native American	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%
Other	5.7%	5.4%	5.6%	9.1%	5.8%	4.8%
International student	2.6%	2.2%	4.7%	100.0%	3.5%	1.1%
% Male	18.7%	15.6%	30.8%	18.2%	22.0%	13.0%
Highest degree						
BA/BS	23.0%	26.4%	9.3%	27.3%	19.7%	28.6%
MA/MS	71.3%	69.6%	78.5%	68.2%	73.9%	67.0%
Degree type						
PhD	64.6%	55.8%	93.5%	86.4%	—	—
PsyD	34.6%	43.2%	6.5%	13.6%	—	—
Other	0.6%	0.7%	0.0%	0.0%	—	—
University status						
Not for profit	89.8%	87.2%	99.1%	95.4%	95.7%	79.4%
For profit	10.1%	12.8%	0.9%	4.5%	4.3%	20.5%
Training program balance	45.9 (17.5)	45.1 (18.2)	46.6 (13.9)	56.6 (19.0)	53.4 (15.8)	32.2 (11.3)
Year in program						
First	12.0%	12.6%	10.3%	9.1%	9.6%	16.2%
Second	21.3%	22.7%	15.9%	22.7%	19.4%	25.4%
Third	19.9%	20.7%	17.8%	13.6%	18.8%	21.1%
Fourth	21.2%	19.5%	27.1%	22.7%	20.6%	22.7%
Fifth or beyond	15.2%	14.3%	16.8%	22.7%	19.1%	7.6%
Internship	10.5%	10.1%	12.1%	9.1%	12.5%	7.0%

Note. Lower scores on training balance indicate a greater perceived program emphasis on practice. Scores are presented as M (SD).

Results

Training Experiences

Students were similar in their coursework, training status and experiences, and employment outcome plans across the program disciplines with a few exceptions (Tables 1 and 2). Because of the limited number of responses obtained from students enrolled in combined-type programs and this style of training not being recognized as a unique discipline of APA, comparisons were made between only clinical or counseling. Clinical students had slightly more integrated reports, $t(510) = 2.597$, $p = .01$, more doctoral assessment hours, $t(510) = 3.726$, $p < .001$, and fewer doctoral intervention hours, $t(510) = -2.842$, $p = .005$. Conversely, there were no differences in semesters of practicum experience, $t(510) = -.458$, $p = ns$. Comparisons between training in PhD and PsyD program respondents found no differences across the number of integrated reports they were had prepared during training, $t(528) = .446$, $p = ns$, doctoral assessment hours, $t(528) = .202$, $p = ns$, doctoral intervention hours, $t(528) = 1.412$, $p = ns$, or semesters of practicum, $t(528) = -1.319$, $p = ns$. Although generally similar, one notable area of discrepancy was students enrolled in PsyD programs were substantially more likely to receive coursework training projective testing compared with doctoral-level students (77.3% and 34.8%, respectively).

Instrument Experience

Patterns in didactic training coverage and clinical use (see Table 3) are consistent with patterns seen among licensed psychologists (e.g., Wright et al., 2016). The most frequently trained personality instrument was the Minnesota Multiphasic Personality Inventory-2, followed by the Personality Assessment Inventory (PAI). The current Weschler scales ("Wechsler Adult Intelligence Scale IV (WAIS-IV)", Wechsler Intelligence Scale for Children (WISC)) were the most utilized intelligence instruments, with the adult version trained more frequently than child. These were followed closely by the Woodcock-Johnson. The Delis-Kaplan Executive Function System (D-KEFS). Wechsler Memory Scale (WMS- IV) were the most often trained neuropsychological measures, whereas brief symptom inventories, mental status evaluations, and diagnostic interviews were identified frequently as other trained assessment techniques. Frequency of coverage in didactic training exceeded the applied use of the same instruments across all assessment domains. These trends in training frequency are generally consistent across different program types (see Table 4)

Table 2
Extended Demographics on Training Experience

Variables	Total (n = 534)	Program type: Clinical (n = 405)	Program type: Counseling (n = 107)	Combined (n = 22)	PhD (n = 345)	PsyD (n = 185)
Integrated reports	18.2 (30.5)	19.7 (31.4)	11.4 (21.5)	22.2 (44.6)	18.7 (31.1)	17.4 (29.6)
Estimated doctoral intervention hours	385.7 (388.8)	361.4 (385.4)	480.0 (380.0)	374.4 (441.2)	404.0 (383.0)	354.0 (400.0)
Estimated doctoral assessment hours	165.5 (242.5)	184.6 (260.1)	87.0 (145.3)	194.8 (210.6)	167.6 (264.45)	163.1 (198.5)
Semesters of practicum	5.5 (3.4)	5.3 (3.4)	6.4 (3.5)	5.0 (3.2)	5.9 (3.4)	4.9 (3.4)
Completed assessment coursework						
Objective personality	90.8%	90.9%	95.3%	68.2%	89.0%	94.6%
Projective personality	49.6%	52.7%	36.4%	54.5%	34.8%	77.3%
Neuropsychological	41.0%	46.7%	16.8%	54.5%	41.7%	39.5%
Child/developmental	40.8%	45.2%	19.6%	63.6%	38.3%	45.4%
Forensic	10.5%	12.3%	2.8%	13.6%	7.8%	15.1%
Developmental	19.5%	21.5%	11.2%	22.7%	17.1%	24.3%
School-based assessment	15.4%	15.8%	8.4%	40.9%	11.0%	23.2%
Intellectual	99.3%	99.8%	100.0%	86.4%	98.0%	100.0%
Other training (practicum, workshop, etc.)						
Objective personality	59.7%	60.0%	61.7%	45.5%	58.6%	61.6%
Projective personality	35.2%	37.0%	29.9%	27.3%	27.2%	49.7%
Neuropsychological	53.2%	57.5%	36.4%	54.5%	55.4%	49.2%
Child/developmental	48.9%	53.1%	33.6%	45.5%	47.0%	53.0%
Forensic	23.0%	26.2%	13.1%	13.6%	17.7%	31.9%
Developmental	35.0%	38.8%	20.6%	36.4%	30.7%	43.2%
School-based evaluation	23.8%	25.7%	14.0%	36.4%	18.8%	33.5%
Intellectual	67.8%	70.4%	58.9%	63.6%	67.2%	68.6%

and program disciplines (see Table 5) as magnitudes of effect for differences reflect negligible effects.

Perceived Competence

Average level of perceived competence varied substantially across individuals, with ranges of confidence in their training ranging from *not at all* competent to *extremely competent* on most instruments. In general, when patterns emerged, they were mirrored by notable differences in frequency of traditional/didactic training and practicum experience. Differences in perceived competence between program type and program discipline also frequently fell most within the negligible range of effect estimates. Some notable exceptions to this occurred, however. Differences in perceived competency were pronounced for the current Weschler scales (Wechsler Adult Intelligence Scale-IV/Wechsler Intelligence Scale for Children-V; d = .48 and d = .41, respectively), with clinical students reporting greater self-perceived competence. Across the personality measures, those from clinical programs reported more self-perceived competence for the Personality Assessment Inventory (d = .52), Thematic Apperception Test (d = .49), and Rorschach (d = .93). Symptom validity testing was also higher among those from clinical programs (d = .62). When averaged across instruments, higher perceived competence in assessment (M = 62.8, SD = 14.4) is related to more client hours of practice with assessments, r = .33, $p < .001$, and a higher number of integrative reports, r = .29, $p < .001$. Perceived competence is less strongly related to overall number of face to face (therapy + assessment) client hours, r = .16, $p < .001$, number of didactic assessment courses taken, r = .14, p = .03, and not related to semesters of practicum, r = .04, p = *ns*. Thus, clinical application of assessment (rather than didactic training or nonassessment client experiences) were most strongly associated with higher perceived competence.

Discussion

This study evaluated assessment training using a nationally recruited sample of HSP doctoral trainees. Previous research has examined assessment training trends utilizing secondary indicators (e.g., training directors and syllabi) or limited samples. This study is the first to use a nationally drawn and representative sample of trainees to examine trends across all types of psychological assessment. Results suggest four findings: (a) training in instruments reflect similar patterns to those observed in professional practice but some key areas of assessment practice remain either undertrained, or perceived lower, than others, (b) some differences exist across program specific experiences, (c) these differences generally reflect different frequency of exposure to instruments and content rather than the perceived outcomes of training, and (d) skill practice components of training are consistently lower than more traditional didactic experiences.

In general, trends in training are like those of practicing psychologists (Wright et al., 2016). A few exceptions also emerged that warrant specific attention (see Table 2). One noteworthy example is that approximately a quarter of students indicated no formal training in diagnostic interviewing. This struck us as disconcerting, given that structured and semistructured interviews are frequently utilized in both research and clinical settings (e.g., the clinician-administered PTSD Scale in the Veterans Affairs). Conversely, high rates of training in single symptom screening inventories are not surprising, given their embrace by training programs and practice settings as screening instruments offer brevity and targeted measurement. However, the opaqueness of interpretation

Table 3
Training, Clinical Use, and Perceived Competence Across Instruments

Assessment domain and instrument	Has training		Used clinically		Trained competence	
	%	*n*	%	*n*	*M*	*SD*
Personality						
MMPI-2	82.2%	439	43.4%	232	57.4	22.4
PAI	72.3%	386	50.2%	268	64.1	22.6
MMPI-2-RF	57.3%	306	32.6%	174	60.3	21.2
Thematic aptitude test	47.8%	255	25.8%	138	52.8	24.8
MMPI-A	38.8%	207	21.7%	116	60.1	21.3
MCMI-IV	35.2%	188	20.0%	107	58.3	22.7
Rorschach	33.0%	128	22.7%	121	52.2	27.8
MMPI-A-RF	15.9%	85	7.5%	40	61.4	21.3
Intellectual						
WAIS-IV	97.6%	521	73.6%	393	72.4	19.5
WISC-V	74.3%	397	49.4%	264	71.6	21.0
Woodcock-Johnson-IV	67.6%	361	46.4%	248	64.7	21.9
WASI-II	45.9%	245	34.5%	184	69.1	25.4
WISC-IV	35.0%	187	17.2%	92	67.1	22.8
WPPSI-IV	35.0%	187	18.7%	100	57.6	26.5
Stanford Binet-5	13.3%	71	7.9%	42	51.6	24.4
WAIS-III	12.4%	66	7.1%	38	71.2	19.1
DAS-2	12.2%	65	8.2%	44	56.8	26.7
Neuropsychological						
D-KEFS	48.1%	257	35.0%	187	62.0	24.8
WMS-IV	45.1%	241	31.8%	170	63.0	22.8
RBANS	37.8%	202	27.3%	146	61.4	25.3
CVLT-II	37.8%	202	29.8%	159	66.9	24.5
NEPSY-II	25.7%	137	19.3%	103	59.9	22.6
NAB	10.9%	58	7.9%	42	61.3	21.7
Other						
Symptom inventories	87.8%	469	83.0%	443	75.4	18.4
Mental status exams	70.6%	377	55.8%	298	68.1	20.3
Diagnostic interviews	67.6%	361	59.4%	317	69.9	19.6
Performance validity test	46.8%	250	37.3%	199	67.4	22.3
Computerized attention tasks	47.6%	254	44.4%	247	67.8	18.8
Scholastic achievement tests	35.0%	187	33.1%	177	68.2	19.7
Symptom validity tests	16.7%	89	12.0%	64	67.3	22.5

Note. MMPI-2-RF = Minnesota Multiphastic Personality Inventory-2-Restructured Form; MMPI-A = Minnesota Multiphastic Personality Inventory-Adolescent; WPPSI = Wechsler Preschool and Primary Scale of Intelligence; DAS = Differential Ability Scales; D-KEFS = Delis-Kaplan Executive Function System; RBANS = Repeatable Battery for the Assessment of Neuropsychological Status; CVLT = California Verbal Learning Test; NEPSY = A Developmental NEuroPSYchological Assessment; NAB = Neuropsychological Assessment Battery; MMPI = Minnesota Multiphasic Personality Inventory; PAI = Personality Assessment Inventory; WAIS = Wechsler Adult Intelligence Scale; WISC = Wechsler Intelligence Scale for Children. Trained competence reflects the perceived competence of an individual and was collected, and is based on, only those individuals who had didactic training on the particular instrument.

for even widely validated symptom inventories (Piotrowski, 2018) is problematic, and care must be taken to ensure that these instruments are used within the scope as screening tools rather than replacements for stronger evidence-based assessment practice.

Training in symptom validity testing was extremely low. Whereas the Minnesota Multiphasic Personality Inventory is a frequent symptom validity inventory in practice (Russo, 2018), it is not the only one used (Sharland & Gfeller, 2007). Moreover, whereas the validity scales of popular instruments consistently demonstrate utility (e.g., Hawes & Boccaccini, 2009; Ingram & Ternes, 2016), they are not recommended for use in isolation. Indeed, a multimodal evaluation of response style is a best practice (Slick, Sherman, & Iverson, 1999). Symptom validity determinations are not only relevant to many evaluations but also central to addressing some referral questions. Given concern over symptom misrepresentation within many health service settings (e.g., Ray, 2017), it was alarming to us that trainees report not being provided coursework and exposure to those techniques and assessment tools. Perhaps trainees are utilizing clinical judgment to make determinations of symptom validity using information gleaned from diagnostic interviewing. However, given the rate at which structured formats are incorporated into training (only ~75% of trainees), we are concerned if those are the methods underlying determinations because of the resulting accuracy and biases inherent to clinical decision making (Grove, 2005).

An important remaining question stemming from these findings is about what predicts trainee perceptions of their competence. There was a wide range of scores for trainee competence observed across all instruments, suggesting variability in the perception of effectiveness across individuals. Understanding mediating/moderating roles of (e.g., trainee, program, and supervision experiences processes) would benefit from further study. The effectiveness of different instructional techniques and applied experiences would also benefit from further investigation. In general, the rate at which

Table 4
Training, Clinical Use, and Perceived Competence Across Instruments by Program Type

	PhD (n = 345)				PsyD (n = 185)							
			Trained competence				Trained competence					
Domain/instrument	Has training	Used clinically	*M*	*SD*	Has training	Used clinically	*M*	*SD*	t	d	φ Training	φ Use
Personality												
MMPI-2	75.4%	38.8%	53.4	21.8	95.1%	51.4%	63.1	22.0	−4.50***	0.44	0.24***	0.12*
MMPI-2-RF	54.5%	34.8%	59.6	21.5	61.6%	27.6%	61.2	21.0	−0.64	0.07	0.09	0.09
PAI	64.1%	44.3%	60.2	22.3	87.0%	60.5%	69.5	21.9	−4.03***	0.42	0.24***	0.15**
MMPI-A	24.6%	13.6%	55.8	20.1	65.4%	36.8%	62.3	22.1	−2.18*	0.31	0.39***	0.26***
MMPI-A-RF	9.9%	5.8%	61.5	21.8	27.0%	10.8%	61.2	21.4	0.63	0.01	0.26***	0.09
MCMI-IV	25.2%	14.8%	55.0	21.2	54.6%	30.3%	61.3	23.7	−1.90	0.27	0.29***	0.18***
Rorschach	22.6%	12.8%	44.6	28.8	51.9%	41.1%	59.1	24.9	−3.41**	0.53	0.29***	0.35***
Thematic aptitude test	33.0%	14.8%	43.3	25.7	75.7%	46.5%	60.5	21.2	−5.66***	0.73	0.41***	0.34***
Intellectual												
WAIS-III	12.2%	7.2%	72.7	19.3	13.0%	7.0%	68.7	18.8	0.81	0.21	0.03	0.02
WAIS-IV	96.5%	72.2%	70.1	20.2	99.5%	76.2%	76.4	17.6	−3.66***	0.33	0.09	0.04
WISC-IV	35.4%	17.1%	66.3	23.1	35.1%	17.8%	68.7	22.3	−0.69	0.10	0.05	0.03
WISC-V	66.4%	44.3%	68.9	21.1	88.6%	59.5%	75.7	19.5	−3.22**	0.33	0.24***	0.14**
Woodcock-Johnson IV	69.3%	47.8%	63.7	21.8	64.9%	44.3%	66.9	21.4	−1.31	0.14	0.07	0.03
DAS-2	15.4%	11.3%	59.8	24.4	5.9%	2.7%	46.0	24.3	1.25	0.46	0.14**	0.15**
Stanford Binet-5	14.2%	8.1%	51.4	25.5	11.9%	7.6%	52.2	22.0	−0.14	0.03	0.04	0.02
WPPSI-IV	34.2%	19.7%	58.0	27.4	37.3%	17.3%	56.7	25.0	0.32	0.04	0.06	0.04
WASI-II	45.5%	34.2%	69.2	25.8	45.9%	34.1%	68.2	24.8	0.31	0.04	0.03	0.05
Neuropsychological												
D-KEFS	48.7%	38.0%	64.3	23.7	47.0%	29.7%	57.0	26.0	2.16*	0.30	0.03	0.08
WMS-IV	42.9%	31.3%	64.4	23.9	49.2%	32.4%	60.3	20.4	1.40	0.18	0.06	0.01
RBANS	35.1%	27.2%	63.1	24.3	42.7%	27.0%	58.0	26.5	1.35	0.20	0.07	0.01
CVLT-II	40.6%	33.9%	69.3	23.5	32.4%	21.6%	60.4	25.7	2.26*	0.36	0.08	0.12*
NEPSY-II	23.5%	19.4%	63.0	22.6	30.3%	19.5%	55.3	21.9	1.95	0.34	0.08	0.03
NAB	12.2%	9.9%	61.0	20.4	8.1%	3.8%	60.2	24.8	0.10	0.03	0.08	0.12*
Other												
Symptom inventories	89.6%	86.7%	74.7	18.1	85.4%	76.8%	76.4	19.0	−0.91	0.09	0.07	0.13*
Symptom validity tests	10.7%	8.7%	66.6	23.3	27.0%	17.3%	66.9	22.0	−0.56	0.01	0.21***	0.14**
Performance validity test	43.8%	37.4%	67.6	21.2	52.4%	36.8%	66.7	24.0	0.32	0.04	0.08	0.00
Computerized attention tasks	49.0%	45.5%	68.0	18.1	45.4%	42.7%	67.0	20.0	0.36	0.04	0.04	0.03
Scholastic achievement tests	32.5%	30.4%	67.7	19.2	39.5%	37.8%	69.1	20.7	−0.46	0.07	0.08	0.09
Diagnostic interviews	75.1%	65.8%	69.5	19.8	53.0%	47.0%	70.6	19.3	−0.45	0.05	0.23***	0.18***
Mental status exams	66.1%	52.5%	66.0	20.2	79.5%	62.2%	71.2	20.1	−2.41*	0.26	0.15**	0.09

Note. MMPI-2-RF = Minnesota Multiphastic Personality Inventory-2-Restructured Form; MMPI-A = Minnesota Multiphastic Personality Inventory-Adolescent; WPPSI = Wechsler Preschool and Primary Scale of Intelligence; DAS = Differential Ability Scales; D-KEFS = Delis-Kaplan Executive Function System; RBANS = Repeatable Battery for the Assessment of Neuropsychological Status; CVLT = California Verbal Learning Test; NEPSY = A Developmental NEuroPSYchological Assessment; NAB = Neuropsychological Assessment Battery; MMPI = Minnesota Multiphasic Personality Inventory; PAI = Personality Assessment Inventory; WAIS = Wechsler Adult Intelligence Scale; WISC = Wechsler Intelligence Scale for Children.
* $p < .05$. ** $p < .01$. *** $p < .001$.

trainees endorsed applied training opportunities were lower than more traditional didactic experiences. Whereas this may be a function of interest (e.g., those who enjoy assessment will seek related applied experiences), hands-on experience is a key component in training (APA BEA, 2020). Providing additional supervised applied training exposure (e.g., in the context of a class or in-house practicum experience), may help to facilitate perceived as well as realized, competence on many of these assessment techniques, particularly as research on the role of mediating factors becomes clear.

Acquiring administration and scoring skills in psychological assessment is critical in training (APA BEA, 2020) and is related to greater perceived competence. As such, courses often include an application component of didactically covered material (Childs et al., 2002). A trend that we found interesting was that the distribution of trainee perceived self-confidence ratings for intellectual measures. These ratings were skewed slightly higher relative to personality instruments, which may relate (in part) to the lower clinical utilization opportunities reported here by trainees for personality instruments. Obviously, no degree of training can completely eliminate all perceptions of insufficient preparation, nor should this be the goal. However, clinicians who lack necessary and appropriate levels of self-perceived expertise relative to their peers may be vulnerable to producing unhelpful, vague, or insufficiently detailed diagnostic assessments or to avoiding psychological assessment practice because training predicts subsequent utilization (Cook et al., 2017). Increasing a personal sense of competence promotes willingness to engage in future tasks, and this is important in the development of professional identities. Indeed, trainees acquire fewer hours providing psychological assessment services compared with traditional therapy (assessment comprises only 22% of total hours; APPIC, 2018). This discrepancy may relate to practicum opportunities provided to students within the community but may also be a consequence of lower

Table 5
Training, Clinical Use, and Perceived Competence Across Instruments by Program Discipline

	Clinical (n = 405)				Counseling (n = 107)							
			Trained competence				Trained competence					
Domain/instrument	Has training	Used clinically	*M*	*SD*	Has training	Used clinically	*M*	*SD*	t	d	φ Training	φ Use
Personality												
MMPI-2	82.2%	44.4%	58.3	22.3	85.0%	40.2%	54.0	22.5	1.59	0.19	0.08	0.03
MMPI-2-RF	59.3%	34.1%	61.1	21.4	51.4%	26.2%	56.7	20.6	1.41	0.21	0.07	0.06
PAI	75.6%	55.8%	66.4	22.0	68.2%	34.6%	54.6	23.0	3.95***	0.52	0.19***	0.20***
MMPI-A	43.2%	24.9%	60.1	21.8	24.3%	10.3%	57.1	20.7	0.67	0.14	0.16**	0.14**
MMPI-A-RF	17.8%	8.1%	61.8	22.1	10.3%	4.7%	61.2	18.1	0.09	0.03	0.90	0.05
MCMI-IV	35.8%	21.7%	59.4	24.0	36.4%	15.0%	55.5	17.9	1.10	0.18	0.07	0.07
Rorschach	35.1%	25.2%	56.1	27.3	26.2%	13.1%	32.4	23.1	4.65***	0.93	0.09	0.11*
Thematic aptitude test	50.9%	29.6%	55.0	24.5	41.1%	15.0%	42.7	24.5	2.91*	0.49	0.13*	0.15**
Intellectual												
WAIS-III	11.4%	7.2%	72.0	18.4	16.8%	6.5%	70.7	21.5	0.20	0.05	0.06	0.01
WAIS-IV	97.8%	77.8%	74.4	18.4	98.1%	57.9%	64.6	22.1	4.14***	0.48	0.09	0.17***
WISC-IV	34.6%	18.8%	69.5	21.8	39.3%	11.2%	59.6	25.5	2.27	0.41	0.06	0.08
WISC-V	79.3%	55.6%	73.3	20.3	57.0%	24.3%	63.0	24.1	3.10**	0.45	0.20***	0.25***
Woodcock-Johnson IV	70.1%	49.1%	65.7	21.5	57.9%	35.5%	60.7	23.8	1.51	0.21	0.10	0.11*
DAS-2	13.6%	9.1%	58.2	27.4	8.4%	5.6%	47.9	23.5	1.13	0.40	0.07	0.05
Stanford Binet-5	12.8%	7.4%	52.3	23.8	15.0%	8.4%	48.5	27.8	0.49	0.14	0.02	0.04
WPPSI-IV	36.5%	20.2%	58.6	26.5	29.0%	10.3%	52.1	29.0	1.13	0.23	0.06	0.12*
WASI-II	50.9%	38.0%	69.8	25.5	27.1%	21.5%	66.5	25.8	0.63	0.12	0.19***	0.13**
Neuropsychological												
D-KEFS	54.3%	39.0%	62.2	24.5	22.4%	16.8%	59.3	28.3	0.49	0.11	0.25***	0.19***
WMS-IV	48.4%	35.3%	63.4	21.5	34.6%	18.7%	60.3	27.1	0.64	0.12	0.11*	0.14**
RBANS	41.5%	28.9%	60.2	25.6	23.4%	19.6%	65.4	24.2	−0.97	0.20	0.14**	0.09
CVLT-II	42.2%	33.3%	68.5	23.3	22.4%	16.8%	56.0	31.5	1.88	0.45	0.16**	0.14**
NEPSY-II	28.6%	21.7%	60.3	22.2	13.1%	9.3%	58.9	24.7	0.20	0.06	0.14**	0.12*
NAB	12.3%	8.9%	63.2	22.0	5.6%	4.7%	51.8	13.9	1.63	0.61	0.08	0.06
Other												
Symptom inventories	89.4%	84.0%	76.3	18.6	80.4%	79.4%	72.0	17.4	2.03*	0.24	0.12*	0.04
Symptom validity tests	20.0%	13.8%	68.3	23.3	4.7%	4.7%	57.2	8.5	2.37*	0.62	0.16**	0.11*
Performance validity test	53.1%	42.2%	67.3	22.7	24.3%	17.8%	67.4	19.8	−0.02	0.00	0.23***	0.20***
Computerized attention tasks	51.1%	47.4%	67.5	19.3	29.0%	29.9%	71.0	16.2	−1.07	0.19	0.20***	0.15**
Scholastic achievement tests	37.5%	34.6%	68.8	20.1	22.4%	26.2%	66.2	17.1	0.68	0.14	0.14**	0.07
Diagnostic interviews	70.6%	61.7%	71.1	19.7	56.1%	50.5%	63.7	17.8	2.89**	0.39	0.12*	0.09
Mental status exams	71.6%	56.5%	69.3	20.7	70.1%	55.1%	63.6	19.0	2.25*	0.28	0.07	0.04

Note. MMPI-2-RF = Minnesota Multiphastic Personality Inventory-2-Restructured Form; MMPI-A = Minnesota Multiphastic Personality Inventory-Adolescent; WPPSI = Wechsler Preschool and Primary Scale of Intelligence; DAS = Differential Ability Scales; D-KEFS = Delis-Kaplan Executive Function System; RBANS = Repeatable Battery for the Assessment of Neuropsychological Status; CVLT = California Verbal Learning Test; NEPSY = A Developmental NEuroPSYchological Assessment; NAB = Neuropsychological Assessment Battery; MMPI = Minnesota Multiphasic Personality Inventory; PAI = Personality Assessment Inventory; WAIS = Wechsler Adult Intelligence Scale; WISC = Wechsler Intelligence Scale for Children. Combined programs were excluded from analysis because of an insufficient sample size for meaningful between-group comparisons.
* $p < .05$. ** $p < .01$. *** $p < .001$.

perceived levels of training because confidence increases the probability of behavior.

Programs should work toward increasing assessment practice because this may help increase perceptions of competence. There are various mechanisms that may boost assessment use and associated opportunities for trainees. The feasibility of different mechanisms are likely to differ across programs, depending on availability of resources and outside opportunities. Some ideas include having trainees give assessments in the course of therapy (or as a standardized part of client intakes) because personality instruments can predict important clinical outcomes, like working alliance and engagement (Patel & Suhr, 2019). Additionally, programs may want to explore a targeted expansion of assessment specific practicums to health service settings. Incorporating psychological assessment (and psychology more broadly) as a consistent aspect of medical care is likely to bolster appreciation of the services we provide, increase referrals, and strengthen health service psychology's role in modern health care.

In summary, this study expands the existing literature by providing a nationally sampled and representative study on trainee perceptions and educational experiences. Results are consistent with past research on training practices in doctoral HSP programs and are generally consistent across program and disciplines. Results also emphasize the importance of applied practice with assessments during training. As with all studies, there are also limitations. Self-perception does not equate to verified levels of skill (see Dunning, Johnson, Ehrlinger, & Kruger, 2003). Trainees rated their instrument competence by comparing themselves with their peers. Perceptions of confidence in training are rated to same-stage peer and may not reflect perception of competence relative to other outcomes, such as independent practice. It is possible that scores of self-perceived competence reflect the nat-

ural divide, resulting in shared educational experience (half of students will be less than average and half will be more than average). Although possible, we do not believe this invalidates our results, however, because self-perceptions are based on broader comparisons than those limited to shared cohort experiences (e.g., professional conferences, listservs, research collaborations, etc.) and because even when experiences are shared, the actual and perceived outcomes may differ. Whereas perceived competence is associated with clinical practice experience, this relationship does not imply a causality. It may be that higher perceived competence produces more pursuit and engagement in assessment-focused clinical practicums or that practice opportunities do in fact result in higher perceived competency. Relatedly, perceived level of competency is likely not predicted solely by instructional quality. As such, increasing the quantity (or even quality) of assessment training experience may not necessarily improve training competence or outcomes for all individuals or for all individuals in the same way. Given the interpretive deficits in assessment, even among highly credentialed individuals (Guilmette et al., 2008), more research is needed using trainees themselves to evaluate educational practices and outcomes.

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