Statistical Results of the NCTRC Certification Exam: The First Five Years

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The purpose of the article is to provide an overview of the test development process and present the statistical results of the first five years of implementation of the National Council for Therapeutic Recreation Certification (NCTRC) Exam. The national certification exam was developed using a national job analysis involving therapeutic recreation personnel. NCTRC in consultation with Educational Testing Service (ETS) of Princeton, New Jersey, developed the national certification exam following a recognized and validity-orientated 10 step process. National experts representing various areas of service of the profession of therapeutic recreation participated throughout this process and provided the professional content for the exam. The test is composed of 200 multiple choice items and was first implemented in November 1990. Statistical findings presented in this article are based on demographic and test score information from 15,378 test results of individuals who sat for the test during one of the first nine administrations (November 1990 and November 1995). Statistical analyses indicate that the exam is a reliable instrument for use in the national certification program. Discussion of the relationship between test scores and demographics describing the population of test takers is provided.

KEY WORDS: *Certification, Certification Exam, Credentialing, Standardized Test Development, Therapeutic Recreation.*

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During the past five years, NCTRC has been actively involved in the development and implementation of a national certification exam for the profession of therapeutic recreation. To date, well over 15,000 individuals have completed one or more attempts of the certification exam with an established passing rate 92.8%. The purpose of this article is to provide an overview of the testing process and to present the statistical findings related to the first five years of test implementation. Given the importance of the exam to the NCTRC certification process, it is deemed critical to share the statistical results with the field and to document such findings for future use.

NCTRC and the Certification Exam Process

The National Council for Therapeutic Recreation Certification (NCTRC), established in 1981, is the recognized certifying agency for therapeutic recreation personnel in the United States. Currently, 14,000 therapeutic recreation personnel are certified at the professional Certified Therapeutic Recreation Specialist (CTRS) level. The mission of NCTRC is to protect the consumer of therapeutic recreation services by promoting the provision of quality therapeutic recreation services offered by NCTRC certificants. Through the NCTRC Certification Program, standards for therapeutic recreation personnel have been established at the professional level. To be awarded the Therapeutic Recreation Specialist certificate, an individual must first meet eligibility requirements and then pass a knowledge-based standardized examination.

Since the formation of NCTRC in 1981, therapeutic recreation certification standards have been developed based on the standards of the National Commission for Certifying Agencies (NCCA). NCCA is the standards setting and accrediting body of the National Organization for Competency Assurance (NOCA, 1987). NCCA has 10 areas of criteria that each national certification organization must address in order to be accredited: (a) administrative independence; (b) bias; (c) continuing competence; (d) cut-off scores; (e) discipline; (f) education and certification; (g) eligibility for certification; (h) public members; (i) reliability; and (j) validity. NCTRC was awarded national accreditation by NCCA in 1993 as evidence of meeting the national standards for certifying agencies. One of the criterion from the NCCA validity standard states that the certifying agency must have a "mechanism used to evaluate individual competence (which) is objective, fair and based on the knowledge and skills needed to function in the health profession" (National Commission for Health Certifying Agencies, 1986, page xi). This criterion means that national certifying agencies must have a valid and reliable standardized testing mechanism as a component of the certification process. Educational Testing Service (ETS) (1983) has developed strict standards for test construction which incorporate currently accepted methods for establishing reliability and validity within certification tests. The NCTRC certification exam was developed using the ETS method (ETS, 1983; Oltman Norback & Rosenfeld, 1989).

Method

Developing the Standardized Certification Exam

Exam development followed a 10 step process designed and supervised by ETS test development staff. Job Analysis knowledge areas were converted to a blueprint for exam content (Oltman, et al., 1989). Three committees of national experts in therapeutic recreation were formed to participate in the test development process. Using the test blueprint of specifications and the exam content outline, the ETS test development staff assembled a 200-item test form. One of the three committees of national experts established the cut score.

The cut or passing score of the test represents the point that separates the scores of those individuals who were determined to possess minimum professional knowledge for competent practice from those individuals who were assessed by their score not to possess minimum knowledge necessary for competent practice. The Angoff Statistical Method (Livingston & Zieky, 1982) was employed to determine the passing score on the exam.

The first standardized exam for therapeutic recreation professional certification was administered on November 10, 1990 to 3,306 test takers at 41 test sites across the United States. This same ten step process, except for the work of the Cut Score Committee, was then repeated for all of the other forms of the NCTRC certification exam. Once the passing score of the test was approved, other forms of the exam were created as "equivalent" forms.

Data Collection

Data collection within this study was derived from test results of the first nine administrations of the NCTRC Certification Exam: November 1990 through November 1995. ETS administered the test, selected each test center, and monitored the testing procedure. On average, a minimum of 15 individual test sites were sponsored per test administration. Additional sites established by groups of candidates resulted in an average of 30 sites for the first four administrations and an average of 15 for the latter administrations. Population parameters, travel accessibility, and the concentration of NCTRC certificants within various regions of the United States determined the geographic distribution of test sites. Candidates were given the opportunity to establish their own test sites if they had a group of 10 or more individuals and submitted an additional administrative fee.

Only individuals who met NCTRC's sitting requirements were permitted to take the exam. Candidates were requested to preregister for the test. A candidate bulletin containing application forms, demographic questionnaire, sample test items, and test reference materials for registration was provided to each test candidate for testing. The test was administered using a "proctor style" format and candidates were given three and a half hours to complete the test. Special testing accommodations were provided to all individuals who documented the need for such arrangements. All raw test data was sent to ETS for analysis and determination of exam passage. Individuals were notified within six weeks of taking the test of their exam passage status.

Data Analysis

The NCTRC certification exam was scored and analyzed by ETS. ETS prepared a summary statistical report for each administration of a previously administered form of the NCTRC test. For each test administration, raw scores (number of items answered correctly) were converted to the NCTRC scaled score which has a range from 20 to 95 with a cut or passing score of 55. Scaling allows scores from equivalent test forms to be reported and analyzed on a common scale (NCTRC, 1995). The scaling process is directly related to the cut score decision. The range of raw scores are adjusted to the scale range taking into account item difficulty. It is important to note that scaled scores are not percentage scores (e.g., based upon scores of 0 to 100). Scaled scores represent different raw scores that reflect the same level of knowledge as established on different, but equivalent test forms. Therefore, rather than reporting that a score of 135 (on a 200 item exam) is the "same" as the score of 140 on an equivalent form (of the 200 item exam), both scores are simply adjusted to a common scaled score (i.e., 60). Thus, scores from the equivalent test forms can be reported and analyzed using the common scaled score.

In addition to test scoring, ETS conducted an array of statistical analyses involving each completed test form. Germane to this article, summary statistics pertaining to reliability,

total test statistics, and demographic analysis are provided. To determine the reliability of each test form, the Kuder-Richardson Formula 20 (Anastasi, 1982) and the Subkoviak Agreement Coefficient (Subkoviak 1988) were calculated. Total test statistics were calculated using descriptive statistical procedures and are presented across all demographic variables contained within the candidate profile. Finally, Analysis of Variance (F tests) was used to assess whether groups defined by selected demographic variables differed significantly with respect to mean total scaled score. Tukey's Honestly Significant Difference (HSD) test was used to assess post hoc comparisons among means. Statistical tests were applied only to the aggregated data (sum of all administrations) and only to groups with sufficient sample sizes to yield stable results. The above analyses reflect data containing the scores of first-time candidates only (i.e., no retest scores) and do not contain the scores of those candidates requiring special testing arrangements.

Results

The results presented in this section are based upon the first five years of implementation of the NCTRC test. Test statistics for 13,956 first-time test takers who did not request special arrangements are presented in summary form within Table 1. In total, 15,378 test registrations were completed for the first nine administrations of the NCTRC test. Of this total number, 1,422 were either repeat test takers or individuals who requested special arrangements for testing. Aggregate data for these 13,956 individuals and their test scores are reported within Table 2. The mean scaled score across all nine administrations of the test was 67.29, with a reported standard deviation (sd) of 6.95. The mean scaled scores and corresponding sd for all administrations are presented in Table 1. These mean scores reflect a high percentage of test scores above the cut score (passage rate). For all administrations, the percent of

Table 1.
NCTRC Certification Exam Summary Statistics

Total Test Statistics[a]	Nov. 90	May 91	Nov. 91	May 92	Nov 92	Nov 93	Nov 94	May 95	Nov 95	Totals[b]
Number of Candidates	3,254	1,887	1,547	1,696	1645	1504	1127	569	1024	13,956
Number of Items	200	200	200	200	200	200	200	200	200	200
Scaled Score Mean	68.95	67.86	67.44	66.86	65.86	65.90	65.21	65.90	65.31	67.29
Scaled Score S.D.	7.00	6.86	6.93	7.09	7.21	7.46	6.99	6.85	6.68	6.95
Kuder-Richardson Reliability	.86	.90	.85	.87	.90	.90	.90	.91	.86	.85-.91
Passing Rate	96%	95%	93%	94%	92%	91.7%	87%	88.1%	89%	92.8%

(a) Based upon first time test takers only.
(b) Does not contain data based upon special need considerations.

individuals with scores above the cut score was 92.8%.

Reliability

Two reliability coefficients are calculated for the NCTRC tests: the Kuder-Richardson Formula 20 (KR-20, see Anastasi, 1982) and the Subkoviak Agreement Coefficient (Subkoviak, 1988). The KR-20 is a measure of content sampling variation and of the homogeneity of the domain covered by the test. Tests with narrow, well-defined content domains (e.g., algebra) tend to have higher KR-20 reliability coefficients. The value of the KR-20 coefficient for the NCTRC test ranges from .85 to .91. The Subkoviak Agreement Coefficient index is based on two factors: the score reliability for the test (i.e., KR-20) and the distance between the cut score and the mean of the test. A Subkoviak Agreement Coefficient of .85 or above is usually considered satisfactory for classification decisions. For the NCTRC tests, Subkoviak Agreement Coefficient values ranged between .97 and .98.

Because the primary purpose of the NCTRC exam is to identify and classify candidates into "certified" and "not certified" categories, it is important to estimate the accuracy of these classifications. The reliability of classification shows the extent to which the classifications made on the basis of the examinees' observed scores are the same as those that would be made on the basis of their true scores, were the true scores known. True scores here are defined as the average of examinees' scores over all possible forms of the tests assuming forms of equal difficulty. The estimated true score can be thought of as the score that would be assigned for an examinee if there were not measurement error. For example, for the total test score for all forms of the test, 98 percent of the examinees were classified the same way using observed scores as they would have been if classification decisions were based on examinee true scores. It is estimated that two percent of the classifications based on observed scores would have been different if based on examinee true scores.

Test Results by Demographic Profile

All candidates registering for the NCTRC test were requested to answer specific demographic questions about themselves and their employment status. Table 2 contains aggregate data across all nine administrations. In addition to the summary data on demographic variables, Table 2 also presents corresponding mean scaled scores for subgroups defined by the test.

Across all administrations of the test, the majority of candidates (91.1%) reported their ethnic/race background as white (not of Hispanic origin). The next largest group was Black/African-American candidates accounting for 5.6% of the candidates. Hispanic and Asian/Pacific Islander followed with 1.5% and 1.0% respectively. No other reported ethnic group accounted for more than 1% of the total candidate population. With respect to gender distribution, women constituted 83.3% of the aggregate data. Viewing the data over all test administrations, the percent of male candidates averaged 16.7% with little variability across administrations.

Geographic location of practice was provided by the test candidates. The five specific regions denoted were: Pacific, West, Great Lakes, Southeast, and Northeast. Consistently, throughout all administrations, the fewest number of candidates came from the West region (13.0%) and the Pacific region (13.8%). The Great Lakes (27.7%) and Southeast (25.3%) regions consistently represented the greatest number of candidates.

There are 11 different primary service settings reported in Table 2. The largest group of candidates were affiliated with psychiatric hospital settings (29.1%). The next largest candidate group worked in rehabilitation hospitals (18.0%), followed by candi-

Table 2.

Aggregate Statistics For NCTRC Certification Exam

Demographic	Freq.[a]	Per.[b]	Scaled Score Mean	Scaled Score S.D.
Gender				
Male	2282	16.7	65.95	7.75
Female	11368	83.3	67.56	6.75
Total	13650			
Missing	306			
Geographic Region of Practice				
Pacific	1843	13.8	68.68	6.39
West	1745	13.0	66.59	7.45
Great Lakes	3705	27.7	67.96	6.35
Southeast	3390	25.3	66.48	7.30
Northeast	2587	19.3	67.11	7.07
Other	127	0.6	65.92	7.26
Total	13397			
Missing	559			
Primary Service Setting				
*Community mental health	518	4.1	66.46	7.31
Correctional institution	90	0.7	65.02	8.14
*General Hospital	621	4.9	68.81	6.63
*Pediatric Hospital	215	1.7	68.21	6.35
*Public Recreation & Parks	503	4.0	68.07	6.47
*Psychiatric Hospital	3658	29.1	67.42	7.04
*Rehabilitation Hospital	2256	18.0	67.75	6.61
Residential Camp/Outdoor Education	114	0.9	69.04	5.41
*Residential Care	966	7.7	66.48	7.25
*School System	196	1.6	68.34	8.00
*Skilled Nursing Home	1612	12.8	66.07	6.88
Other	1808	14.4	68.16	7.00
Total	12557			
Missing	1399			
Current Employment Status in Therapeutic Recreation				
*Full-time	9308	70.1	66.47	6.70
*Part-time	1649	12.4	68.06	6.55
Retired	17	0.1	68.68	9.46
*Not Working in Therapeutic Recreation	2300	17.3	66.53	6.96
Total	13276			
Missing	680			

Table 2 (*Continued*)

Demographic	Freq.[a]	Per.[b]	Scaled Score Mean	Scaled Score S.D.
Years of Experience in Current Setting				
*Less than 2 years	6150	47.6	66.63	6.76
*2–5 years	3599	27.9	67.81	6.97
*6–10 years	1806	14.0	68.06	7.07
*More than 10 years	1365	10.6	68.06	7.60
Total	12920			
Missing	1036			
Primary Professional Activity				
*Direct Service to Clients	5647	71.8	66.23	7.03
*Management	651	8.3	68.42	6.49
Education	153	1.9	68.39	9.94
Consulting	145	1.8	68.17	6.08
*Outside the Field of TR	572	7.3	66.19	7.19
Other	698	8.9	66.12	6.15
Total	7866			
Missing	6090			
Time Since Direct Practice was Major Professional Activity				
*1–2 years	1307	47.8	66.18	7.97
*2–5 years	777	28.4	68.92	7.25
*More than 5 years	653	23.9	69.76	7.99
Total	2737			
Missing	11219			
Current Annual Salary				
*$9,999 or under	1632	13.1	66.11	6.49
*$10,000 to $14,999	927	7.4	66.28	7.09
*$15,000 to $19,999	2014	16.1	66.07	7.06
*$20,000 to $24,999	3367	26.9	67.20	6.67
*$25,000 to $29,999	2303	18.4	68.17	6.96
*$30,000 to $34,999	1300	10.4	68.79	7.07
*$35,000 to $39,999	553	4.4	68.25	7.23
*$40,000 to $44,999	282	2.3	70.32	7.27
*$50,000 or over	112	0.9	70.35	7.45
Total	12490			
Missing	1466			
Number of Years as a Certified Recreation Specialist				
*Less than 2 years	1279	9.8	67.27	6.87
*2–5 years	3140	24.0	67.79	6.97

Table 2 (*Continued*)

Demographic	Freq.[a]	Per.[b]	Scaled Score Mean	Scaled Score S.D.
*6–10 years	2295	17.6	68.84	6.90
*More than 10 years	911	7.0	69.30	7.44
*Not certified	5450	41.7	66.05	6.72
Total	13075			
Missing	881			
Primary Motivation for Seeking Certification				
*It is required by employer	1597	14.5	67.39	7.08
*For professional recognition	5034	45.8	67.23	6.73
*To support the therapeutic recreation profession	3349	30.5	68.15	7.07
To increase my present salary level	177	1.6	65.92	7.14
Other	830	7.6	68.82	6.56
Total	10987			
Missing	2969			
Totals[a]	13956	100.0[b]	67.29	6.95

(a) Contains data for first time test-candidates *only*.
(b) May not add to 100.0% due to rounding
(*) Groups contained in the statistical test.
(+) Value included in prior level of variable.

dates who were employed by nursing home facilities (12.7%). No other specified group of candidates accounted for more than 10% of the candidate population.

The majority of candidates reported their current employment status as full-time (70.1%). Part-time status accounted for 12.4% of the candidates, while 17.3% of the candidates reported they no longer worked in the field. Individuals who are retired reflected a very small percent of the candidate pool (0.1%).

The largest group of candidates reporting years of experience in their current setting were candidates who had two years or less of experience (47.6%). During the first administration of the test (November 1990), the largest group of candidates (36.0%) reported between two and five years experience at their current work place. This finding was altered during the later administrations in which candidates with two or less years experience emerged as the largest group (79.7%). Generally speaking, a greater proportion of those taking the exam during later administrations had less experience at their current work setting.

An overwhelming number of candidates (71.8%) completing the NCTRC exam reported that their primary professional activity was providing direct services to clients. The next largest group of candidates (8.3%) were those individuals who reported that they were involved primarily in the management of therapeutic recreation services. Other subgroups, including those involved in education (1.9%), consultation (1.8%), working outside of the field (7.3%), and "other" (8.9%), accounted for a total of 19.9% of those individuals completing the exam. Almost half of these candidates (47.8%) reported that they had not been in-

volved in direct practice for the last one to two years.

Across all administrations of the exam the most frequently reported salary category was in the range of $20,000 to $24,999 (26.9%). Approximately 35% of the test takers reported that they earned less than $20,000 per year, while 18% indicated they made over $30,000.

As expected, most candidates (58.3%) held certification with NCTRC prior to sitting for the exam. With each new administration of the exam the number of incumbents decreased while individuals seeking first time certification (i.e., new graduates) increased. This trend is most illustrated by the fact that the vast majority (94.9%) of the candidates taking the November 1995 administration were not previously certified.

Finally, in addressing the question of motivation for taking the NCTRC exam, 45.8% of the candidates reported they did so primarily for professional recognition, followed by 30.5% who stated they took the test to support the therapeutic recreation profession. Those who reported taking the test to increase their present salary level represented the smallest group of candidates (less than 1.6%).

Differences Within Select Groups

Contained within Table 3 are the results of the statistical tests (One-way ANOVA and Tukey's HSD test) conducted to determine whether demographic groups defined by select variables differ significantly from each other with respect to mean total scaled score. The reader should be cognizant of the power of these statistical tests when applied to the aggregate data. The sample size is very large, consequently, very small differences between groups (less than one scale score point) will be found to be statistically significant, often at the .01 level or beyond. It is suggested that a two-step process be used to arrive at conclusions. First, determine if the difference is statistically significant. Once statistical significance is established, examine whether the differences are large enough to have substantive meaning, keeping in mind that the range of the scaled scores is limited to 20 to 95. Another point to consider is the degree of dispersion centers around the means as indicated by the recorded standard deviation. Comparative means with less sample variability and overlap (smaller standard deviations) contain more distinct "differences" than those means with larger standard deviations (Agnew & Pyke, 1982).

Comparisons of the scaled score means for the service setting groups revealed a number of statistically significant differences ($F_{9,10658} = 14.95$; $p < .0001$). As illustrated in Table 3, those candidates from general hospital settings ($M = 68.81$) scored significantly higher than many of the other candidate groups. Likewise, candidates affiliated with rehabilitation hospitals ($M = 67.75$) and psychiatric hospitals ($M = 67.42$) scored significantly higher than those candidates from community mental health ($M = 66.46$), residential care ($M = 66.48$), and skilled nursing ($M = 66.07$) settings. Other comparisons that were found to be statistically significant are outlined in Table 3.

Results from the statistical analysis indicate that candidates working part-time attained significantly higher scores ($M = 68.06$) than those candidates employed full-time ($M = 66.47$) or those not currently working in therapeutic recreation ($M = 66.53$). The overall F statistic for these comparisons was significant ($F_{2,13256} = 24.72$; $p < .0001$).

The results of the statistical test performed on the aggregate data show that significant differences ($F_{3,12919} = 38.01$; $p < .0001$) exist between those with less than two years of experience ($M = 66.63$) and the other groups. Those with less experience scored lower on the test than individuals with additional years of experience (Table 3). However, it should be noted, that the data do not indicate whether those candidates with less than two years experience in their

Table 3.

Summary of ANOVA and Results of Tukey's Honesty Significant Difference (HSD) Test

Variable	df	F	Significance	Tukey's HSD Results (Significant Comparisons)	
Primary Service Setting	9,10658	14.95	$p < .0001$	General Hospitals	> Community Mental Health > Psychiatric Hospitals > Residential Care > Skilled Nursing Home > Rehabilitation Hospital
				Rehabilitation Hospital Pediatric Hospitals	> Residential Care > Skilled Nursing Home > Community Mental Health
				Public Recreation & Parks Psychiatric Hospitals	> Community Mental Health > Skilled Nursing Home > Residential Care
				School Systems	> Skilled Nursing Home > Residential Care > Community Mental Health
Current Employment Status	2,13256	24.72	$p < .0001$	Part-time	> Full-time > Not working in TR
Years of Experience in Current Setting	3,12919	38.01	$p < .0001$	2–5 years 6–10 years More than 10 years	> Less than 2 years > Less than 2 years > Less than 2 years

Primary Professional Activity	4,7167	19.14	$p < .0001$	Management Education	> Direct Service
				Management Education Consultants	> Outside Field
Time Since Direct Practice was Major Professional Activity	2,2736	57.32	$p < .0001$	More than 2 years	> Less than 2 years
Current Annual Salary	7,12494	47.86	$p < .0001$	Over $40,000	> Less than $40,000
				$25,000–$39,999	> Less than $25,000
				$20,000–$24,999	> Less than $20,000
Number of Years as a Certified Recreation Specialist	4,13074	96.90	$p < .0001$	10 or more years	> Less than 6 years Not Certified
				6–10 years	> Less than 2 years Not Certified
Primary Motivation for Seeking Certification	2,9979	18.24	$p < .0001$	Support TR Profession	> Professional Recognition
					> Required by Employer

current setting were new to the field or had changed jobs within the past two years.

Specific to the groups included in the ANOVA ($F_{4,7167} = 19.14$; $p < .0001$), direct service candidates obtained scores significantly lower ($M = 66.23$) than the candidates involved in management ($M = 68.42$) and education ($M = 68.39$). Candidates involved in management, education, and consultation scored significantly higher than those individuals who reported that their primary professional activity was working outside of the field of therapeutic recreation. With respect to the groups no longer involved in direct practice, candidates who had been out of direct practice for more than two years obtained significantly higher mean scores than those who had been out of direct practice for less than two years ($F_{2,2736} = 57.32$; $p < .0001$).

In general, those candidates with higher reported annual salaries tended to achieve higher mean scores on the exam ($F_{7,12494} = 47.86$; $p < .0001$). As reported in Table 3, candidates earning over $40,000 obtained higher scores ($M = 70.3$) than candidates making less than $40,000 ($M = 66.11$ to $M = 68.25$); candidates making between $25,000 and $39,999 obtained higher scores than candidates making less than $25,000; candidates making between $20,000 and 24,999 obtained higher scores than candidates making less than $20,000.

Those without certification, in the aggregate, earned lower scores (Table 2). Statistically significant differences ($F_{4,13074} = 96.90$; $p < .0001$) were found between candidates with six or more years as a CTRS and candidates with less than six years of certification or those without certification. Candidates with between two to five years of certification also obtained higher scores than candidates with less than two years of certification (Table 3). As denoted in Table 2, there is a steady incremental increase in scaled scores with increased years as a CTRS, suggesting a positive relationship between number of years of certification and scores on the test. Those who had been certified the longest earned the highest scores.

The group that indicated they took the test to support the therapeutic recreation profession earned significantly higher scaled scores ($M = 68.15$) than candidates who responded that their primary motivation for seeking certification was either for professional recognition ($M = 67.23$) or because it was required by their employer ($M = 67.39$). The overall F value for this analysis was significant ($F_{2,9979} = 18.24$; $p < .0001$). No other differences were observed.

Discussion

The process of establishing and implementing the NCTRC exam suggests that an identifiable and unique body of knowledge exists within the realm of therapeutic recreation (Oltman, et al., 1989) and that such knowledge is measurable via a testing process. Through the combined results of the job analysis project (Oltman, et al., 1989), item writing process, and post hoc item review, the NCTRC exam reflects the true nature of the therapeutic recreation process as defined and operationalized through a multifaceted consensus building process. By strictly adhering to the exam blueprint established during the exam review process, the content validity of the exam was assured while allowing for representation of the diversity of settings, personnel, and practice philosophies within the field. Nunnally (1978) indicates that content validity relies on "appeals to reason regarding the adequacy with which important content has been sampled and on the adequacy with which the content has been cast in the form of test items" (p. 93). Thus, the high passing rate of incumbent therapeutic recreation professionals can be taken as an indication of the content validity of the exam.

A shared knowledge base is clearly demonstrated by the high rate of passage achieved by the more than 14,270 individuals who completed the exam during its first nine administrations. The range of the pas-

sage rates was from 87% (November 1994) to 96% (November 1990) with the mean established at 92.8%. The highest rate was established during the first administration of the exam, when the largest number of incumbents completed the exam. The relatively high rate of passing confirms the fact that the majority of incumbents demonstrated their knowledge base of therapeutic recreation and met minimum competence, and thus are qualified to hold the CTRS credential.

Although a high passage rate supports the concept of a shared body of knowledge within the field of therapeutic recreation, significant differences exist among demographic groupings relative to overall test scores. Implications drawn from such results tend to support the premise that although a uniform body of knowledge exists, the degree of familiarization and application of such knowledge varies with respect to practice setting and professional profile. In comparing test scores of individuals from various service settings (Table 2) significant differences emerge. Exam candidates employed within general hospital settings, rehabilitation hospitals, pediatric hospitals, psychiatric hospitals, and public recreation and parks performed statistically higher than those individuals employed in community mental health, residential care, and skilled nursing. Although the ANOVA and the Tukey's HSD test indicated that significant statistical differences existed among certain service settings, unfortunately the tests do not reveal why those differences are present. Explanations for such questions may lie within an array of complex interactions among the variables of staff preparation and selection, the degree of sophistication of therapeutic recreation practice rendered within various settings, and the level and frequency of in-service training offered and participated in by staff. Not surprisingly, the results of the NCTRC exam suggest that there may exist in the field a hierarchy of personnel placement which is related to professional knowledge and practice.

Candidates also reported their current employment status when completing the NCTRC exam. As would be expected, the majority of candidates (70.1%) reported that they were employed full-time in the field. What is most surprising is the fact that those candidates reportedly working only part-time obtained significantly higher scores than those candidates employed full-time or those individuals currently not working in therapeutic recreation. Explanation for such results is difficult to ascertain without more detailed information about these part-time workers.

Analyzing demographic variables which constitute a professional profile found support for the influence of professional longevity on exam score. Both the number of years in current setting and the number of years certified produced results which suggest the influence of professional longevity. Those candidates with more years of experience within their current setting and those individuals who were certified the longest scored significantly higher than those individuals with less longevity in these given categories. Similarly, those individuals whose primary professional activity was managerial in nature scored significantly higher than those individuals whose primary job role was direct service or who were currently working outside the field. From these results, it appears that length of service is significantly associated to some degree with test scores. This observation perhaps lends credence to the importance of "on-the-job training" and career development. Given that the NCTRC exam measures entry level knowledge, it is reassuring to note, that according to the results of this study, those individuals who remain in the field over longer periods of time, including those who move into more administrative positions, maintain a solid level of knowledge about entry level therapeutic recreation practice.

Generally speaking, candidates who have established professional career longevity would also possess higher salaries. Corre-

spondingly, those individuals with higher salaries would also perform significantly better than those candidates with lower salaries by virtue of their longevity in practice. At each level of salary category, individuals within the category obtained significantly higher test scores (on average) in comparison to those individuals represented in lower salary categories. Again, it is suggested that the influential variable in this analysis is career longevity rather than salary. That is, the longer the candidates have been practicing, the higher their salary and the higher their score on the NCTRC test. This fact should be tempered with the realization that the NCTRC exam is designed to test minimal knowledge necessary to practice therapeutic recreation at a competent level. Performance above and beyond the minimal level (passing score) is not necessary to establish competency. However, what these findings might suggest is that individuals employed within therapeutic recreation continue to learn on the job and maintain minimum practice levels thus providing justification for accepting continued practice as a recertification requirement.

Some individuals indicated a high level of interest in their profession as evidenced by the fact that 30.5% of the candidates reported that they completed the test to support the therapeutic recreation profession. This group of candidates obtained significantly higher test scores than those individuals who reported that they took the test for professional recognition (45.8%) or because it was required by their employer (14.5%). It is not clear from the data whether intrinsic motivation plays an important role in obtaining a higher passing score, or whether those individuals (i.e., educators and consultants) without the perceived pressure of extrinsic requirements in their employment positions perform better on the exam.

Summary and Conclusions

The development, implementation and analysis of the NCTRC certification exam involved a comprehensive and complex process. With the initiation of the testing process, NCTRC has strengthened its position of assuring the public a degree of competence in therapeutic recreation professionals possessing the CTRS certificate. In addition, by establishing the testing process NCTRC, as well as the therapeutic recreation profession, have met the explicit criteria deemed necessary for recognition by the National Commission for Certifying Agencies.

Through the development and implementation of the job analysis study and subsequent testing program, a body of knowledge that supports minimal competence has been identified within the realm of therapeutic recreation. The entire test process has been defined and operationalized through a multifaceted, consensus building process by incorporating the diversity of settings, personnel, and practice philosophies that exist within the field. The exam process thus reflects the nature of therapeutic recreation as indicated by the national job analysis study. In spite of the fact that some differences among test scores of various segments of the field were found, the statistical data indicate that there is far more homogeneity than difference with respect to core knowledge among certificants.

Future analysis of the testing process is essential to assure the validity of the exam and the credentialing program in its entirety. Therefore, further research is required on several levels. It will be important to probe the predictive potential of the exam with regard to the competence of certified specialists in therapeutic recreation practice. What is the professional profile of a competent CTRS? Are there certain characteristics that hold greater predictive validity than others? Efforts are currently underway to complete a second job analysis study by 1997. This research will provide insight into the question of the stability of professional knowledge for therapeutic recreation practice. Additionally, in depth analysis of the testing content areas and individual item analysis

may help determine the areas in need of further development to test for competent professional knowledge. Tremendous need exists for feedback to the field regarding the relationship of test results to pre-service education and inservice education within the profession. Answers to these research questions will also contribute to the further development of the test process. Additionally, alternative testing methods should be explored and analyzed to insure ease of application.

In the final analysis, the exam has provided the therapeutic recreation profession an opportunity for greater unification and for recognition as a maturing and formidable profession. The results of this study contributed to the expanding volume of knowledge related to therapeutic recreation. As a result, the field is much more recognized by regulatory bodies and other credentialing organizations (i.e., NOCA, the Joint Commission for the Accreditation of Health Care Organizations, and the American Hospital Association). Such efforts need to be continued in all aspects of the field if therapeutic recreation expects to develop into a highly recognized and utilized healthcare service.

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