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Exploratory Factor Analysis of the Index for Training Need (ITN) Interest Scale with Practicing Rural Social Workers

Timothy Conley, PhD, David Schantz, PhD, Sarah Aronson, MSW and Sarah Shae, MSW

Introduction

Scholarly opinion concerning the academic preparedness of social workers to face the challenges of the addicted person generally finds this area of the profession's teaching in need of strengthening. (Googins, 1984; Alaszewski & Harrison, 1992; Magura, 1994; Rhodes & Johnson,1996; Hall, Amodeo, Shaffer & Vander Bilt, 2000). Hall and her colleagues conclude that while social workers are often in a position to act as first responders to clients who have substance abuse problems, their lack of training may limit the access that substance-abusing clients have to appropriate and effective treatment and intervention. Sun (2001) suggests that the relatively low number of social work graduates involved in alcohol and other drug-related practice may reflect the lack of interest in this field shown by schools of social work throughout their history. Moreover, these authors collectively provide empirical support for the common perception that training resources for social workers in the area of substance-abuse treatment are generally inadequate to meet the demands of practice needs, especially when the social worker goes directly to practice in an addictions-service setting. When examining the social work profession's position in the field of addictions, previous studies generally survey a sample of personnel working in addiction-training facilities (Hall, Amodeo, Shaffer & Vander Bilt, 2000; Sun, 2001; Alaszewski & Harrison, 1992; Burke and Clapp, 1997). To date the authors have not found empirically based work addressing a sample of non-specialist practicing rural social workers' addiction training needs or their interest in various addiction training domains. Even when not addiction specialists, social workers practicing in rural areas need to be prepared to respond to addictive disorders by providing professional services themselves since they are often far from addiction clinics. Therefore, their preparedness and interest in continuing training needs are areas of study which may benefit from further exploration.

This current work is structured to examine the psychometric performance of a scale designed for assessing interest in specific addiction related training areas (Hall, Schaffer & Vander Bilt, 1997). The study was conducted with rural social workers, and sought to elicit the opinion of practitioners regarding the inclusion of addiction content in the new MSW program of this rural state. Some of these results have been reported elsewhere (Authors Suppressed, 2006). However, to assist with this assessment, the study deployed the 20item Index of Training Need interest scale (Hall, Schaffer & Vander Bilt, 1997) to help better quantify the training needs of professionally licensed social workers across the entire rural state. This work addresses the question: What is the psychometric performance and factor structure of this scale as a stand-alone instrument with this population?

Methods

Procedures and Sample

A direct-mail survey was conducted using methodology informed by The Tailored Design Method (Dillman, 2000), which updates Dillman's previous 1978 work called The Total Design Method. Dillman advances a very specific set of empirically supported guidelines for conducting successful self-administered surveys, and applies social-exchange theory (Blau, 1964) to boost response rates. Mailing followed the five-step Dillman process with just a few alterations. Dillman advises enclosing a one dollar bill with the survey as an incentive, but study resources prohibited this. The alternative used was a color-

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ful dollar-bill sized coupon enclosed with the survey as a token of appreciation. This coupon invited participants to log in to the State University's continuing education web-site for a free sample of on-line training. The second alteration to Dillman's method also concerned resources: follow-up phone calls to final non-respondents were not conducted since the study lacked the financial support for the time this would have taken. All materials and methods were approved in advance by the University's Institutional Review Board.

The state that was surveyed licenses only master's level social workers. Of the 382 licensed social workers in the state with valid addresses at the time of the study, 76.9 percent responded to the survey (n = 294). The 294 responding social workers averaged 17.14 years (SD = 9.77) post masters experience, half of them practicing for longer than 15 years. Of this experience, an average of 12.86 years (SD = 8.7) was specifically in a predominantly rural state – a state with no urban areas at all. Of all respondents, 72.1% were female and 26.3% were male. No gender was reported by another 1.6 %. Social workers specializing in addiction comprised only 11.0 % of respondents, though 58.2% of all respondents provide addiction services to some extent in their agencies or practices, and 73.1% have had some post MSW training in addiction. Almost two-thirds (62.7%) report that they often or always come into contact with addicted clients. Measures

Included in the survey was a scale from the 20 -item Index of Training Need (ITN) developed by the Harvard Medical School, Division of Addictions, Addiction Training Center of New England, and Brown University (Hall, Shaffer & Vander Bilt, 1997). ITN items grew out of a review of the clinical literature in the area of substance abuse treatment. ITN item qualitative input came from a series of meetings and focus groups comprised of representatives of addiction treatment centers from several New England states meeting specifically to determine the data needs for the initial ITN study. The index was originally designed to provide guidance for the allocation of existing training resources for addiction center personnel. For the current survey it was anticipated that results from the ITN would inform continuing education and MSW course curriculum development. Appendix A lists all questions.

On the survey, the Index's 20-scale items concerning training needs were preceded by the statement: "Using the following scale, please indicate your interest in participating in a training activity, at your current level, in each of the following areas." The scale given was 0 = no interest, 1=very little interest, 2=moderate interest, 3=considerable interest and 4=maximum interest, resulting in a final score range of between 0 and 80.

The instrument was originally tailored to measure respondents' perceived adequacy in a specific conceptual domain and their interest in receiving training in the same domain. By subtracting adequacy scores from interest scores, Hall, Schaffer & Vander Bilt, (1997) used the difference as an index for determining the training needs of addiction treatment clinic providers in New England. Their sample consisted of 1,684 participants. A principal component analysis of interest-minus-adequacy scores (the index) exhibited a final three-factor structure with domains labeled 1) clinical practice skills, 2) guides and protocols, and 3) specialized training. This factor analytic strategy was reportedly selected because "It tends to yield factors that are intuitively meaningful: It generates an orthogonal solution in which each factor tends to represent a distinct homogeneous subset of variables" (p.595). Each variable subset correlates highly with its factor and remains relatively independent of other variable subsets. "A varimax factor rotation was then conducted to further simplify the underlying factor structure and facilitate interpretation of the results" (Ibid).

Vander Bilt, Hall, Schaffer, Storti & Church (1997) report on results from the study's subsample of nurses and found it very useful for informing plans for future training in that profession. Vander Bilt, Hall &, Schaffer (1997) envi-

sioned the index as "a valuable tool for treatment organizations and educational planners..." (p. 601).They suggest that the ITN is adaptable and provides a much needed standard.

Adaptation of the ITN

The ITN was in fact adapted for this study of rural social workers by omitting the requirement for participants to rate their self-perceived adequacy in specific addiction domains; only interest was measured for all domains. This key modification accommodated the research concern, dominant with direct-mail survey methodology, that a high participant response rate be pre-eminent. Conversations with the state's licensing board and NASW leadership indicated a very poor reception from policy makers and academic leadership to low response rate surveys in the past, a rate attributed to poor methodology, including overly lengthy surveys. Dillman (2000) indicates that excessively lengthy surveys may diminish response rate. Including adequacy ratings in the survey would have required answering the same 20 questions a second time but with a focus on adequacy, not training interest. In addition to the survey's other 24 essential questions, this would have resulted in a 64-item questionnaire which could have lead to responder fatigue and a diminished response rate, a risk deemed unacceptable in light of the fairly small sample size at the outset (382). Therefore, the study employed the ITN questions only with regards to participants rating their interest, not adequacy, and it is this interest scale as a stand-alone tool that was subject to statistical analysis for this report. The survey's very high response rate of 76.9% is attributed in part to the success of this strategy.

Scale item # 13: "Interest in developing diagnostic and treatment formulations" proved problematic as only 51% of participants responded to it, considerably lower than the 95-98% response to other ITN items. This was likely due to its incorrect placement on the survey instrument that participants received, which had been designed specifically for this study. To correct for the disproportionate rate of missing data for this one item, the literature on imputation was consulted (Saunders, et al., 2006; Little & Rubin, 2002; Roth & Switzer III, 1999). Operating within the theoretical guidelines, the missing data was replaced using SPSS Missing Value Analysis function (SPSS, 2004) prior to analysis of the scale. Missing data for all other items was not replaced. By repairing this one item, the loss of a substantial amount of other related information through pairwise deletion of variables was prevented.

Analysis and Results

More than half (59.0%) of respondents reportedly do not feel their education adequately prepared them for work with addicted populations; 81% did not feel their training adequately prepared them to work with co-occurring disordered clients. In general these practitioners expressed a need for strengthening MSW training for work with addicted persons. Additional results concerning adequacy of professional social work education to prepare social workers for servicing addicted clients were included in the survey and are reported on elsewhere (Authors Suppressed, 2006).

Of more concern to the analysis here, the Index for Training Need interest scale exhibits good internal consistency reliability with a Cronbach's alpha of .95. The mean score on the scale with this sample is 43, (SD 16); the median is 44, and the mode is 42. There are weak but significant Pearson's correlations with other non-ITN survey items indicating interest in participating in addiction training in the next year ($r = .18$; $p. < .005$) and with interest in taking on-line continuing education training in addictions ($r = .28$; $p. < .000$) which provide some overall support for convergent validity with items measuring similar constructs.

Exploratory Factor Analysis of the ITN

An exploratory factor analysis was conducted on the ITN interest scale item scores to detect the structure of the relationships between items and to explore the potential groupings of items into distinct factors; it allowed for an exploration of latent constructs within the scale. Exploratory

factor analysis (EFA) is the most appropriate statistical process for examining construct and content validity. (Nunnally, 1978). Nunnally described construct validity specifically with the term "factorial validity." Even prior to this, Guilford (1946) indicated that "The factorial validity of a test is given by its [item] loadings in meaningful, common, reference factors. This is the kind of validity that is really meant when the question is asked: Does this test measure what it is supposed to measure?" (p. 428). Thus, the purpose for the use of factor analysis with the ITN interest scale alone is to summarize the interrelationships among the individual interest scale items -- uncoupled from the adequacy scale items – to see how they factor out. Determining which factors to retain poses a challenge in exploratory factor analysis. DeVellis (1991) suggested that when developing a scale one should consider both Kaiser's eigenvalues and Cattell's scree test when considering factors for retention. Therefore, both eigenvalues and scree plots are examined here to assess the factorial validity of the interest scale. A scree test is a graphic representation which plots eigenvalues on the vertical axis and successive factors on the horizontal axis. The point at which the graph sharply elbows is where the remaining factors explain relatively little important variance regardless of their eigenvalues and may be dis-considered. It is a fairly conservative measure.

All 20 items of the ITN interest scale were entered into factor analysis using the maximum likelihood extraction method with varimax orthogonal rotation. This analysis resulted in three factors accounting for 62% of variance in the solution; see table one. Factor 1 had an eigenvalue of 10.2, accounting for 51.2% of the variance,

Table 1: Factor analysis of the ITN interest items with rural social workers: Initial solution, rotated factor Matrix

Item	Factor 1	Factor 2	Factor 3
Screening Skills	.691		
Intervention Skills	.614		
Relationships to Other Problems	.598		
Marriage and Family Therapy	.593		
Withdrawal	.561		
Treatment Process Skills	.589		
Special Populations	.584		
Dual Diagnosis	.583		
Detoxification	.535		
Treatment Techniques	.513	.612	
Interpersonal Skills		.687	
Therapy Organization & Movement		.793	
Formulations		.768	
Referral Skills		.500	
Administrative Skills		.545	
Substance Abuse Concepts			.920
Theoretical Models			.583
Credentials	.484	.322	.324
Assessment Skills	.428	.254	.201
Ethical Issues	.260	.414	.186

Factor 2 and eigenvalue of 1.16, accounting for another 5.8% of the variance, and Factor 3 a value of 1.06 accounting for 5.3%. While Factors 2 and 3 have eigenvalues above 1.0, they are just barely so and despite collectively accounting for 11.1% of the variance in the solution it is a stretch of the definition to call them valid factors. Examining them for face validity, it is overly challenging to consider the factors as operationalizing divergent concepts. For example, why are administrative skills and formulations in the same factor? Moreover, examination of the scree plot (figure 1), when considered in the light of the weak eigenvalues, suggests that a finding of a single factor solution simply measures need for addiction training across a fairly homogeneous and reliable set of variables.

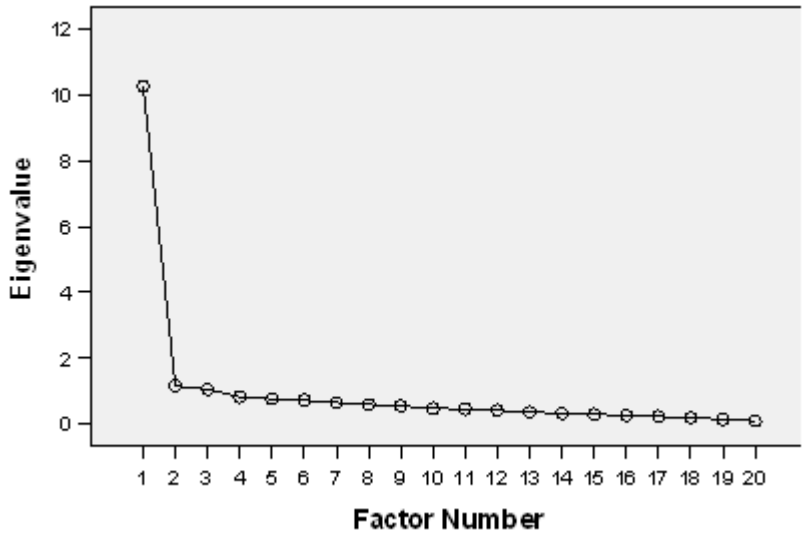
Efforts were made to shorten the scale. Using a loading of .50 as an inclusion criterion, the items for "credentials," "assessment skills," and "ethical issues" failed to load on any factor. These were then removed from the analysis and it was re-run, including the variable for "treatment techniques," which initially loaded significantly (<.50) on two factors. The process was continued through a series of factor analyses whereby each item which failed to load at .50 was removed. The process was halted when the result was a single factor solution consisting of 12 items which explained 64.3 percent of the variance. This 12 item scale included three items which loaded at >.45 but <.50; the alpha reliability was .92.This suggests that statistically speaking the scale could be shortened, but that would come at the price of losing item-specific information.

Subjecting the data to different factor extraction methods did not significantly alter the results. Moreover, analysis was run which employed direct oblimin, a non-orthogonal rotation procedure allowing for factors to correlate with one another. Review of the pattern and structure matrixes did not indicate support for any different conclusion. With this population the scale is best left intact and understood as representing a uni-dimensional construct.

Conclusions and Discussion

The ITN training scale items each provide rich and valuable information for social work educa-

Figure 1: Scree Plot of ITN Interest Items with Rural Social Workers



tors seeking to assess the interest of social worker practitioners in a variety of addiction related topics prior to designing related educational materials. This study provided the opportunity to further examine the psychometric properties of the ITN. It is unique in that the sample consisted of just over 75% of all licensed social workers in a rural state, and that it deployed the ITN interest items as a separate scale. In doing so, the researchers were afforded the opportunity to inform the state's new social work graduate program of the level of interest in diverse addictions topics expressed by the experienced rurally located social work professionals in the field. Results of the survey were incorporated into the curriculum development process for an on-line graduate course in addictions which is currently being offered.

The results of this factor analysis have somewhat limited relevance to trainers and educators. The most substantial findings of the whole study were reported in an earlier manuscript (Suppressed, 2006). Had the work identified specific constructs of interest it would have better advised curriculum designers. But findings here indicate that the ITN interest items, while exhibiting strong internal consistency reliability, did not, in any meaningful way, conceptually parse out into divergent and valid factors. Instead, a single domain of "interest" is captured by the instrument. While shortening the scale would yield a briefer instrument with good internal consistency reliability it is not recommended. In the absence of other studies against which to compare the mean level of interest it is difficult to gauge whether practicing rural social work professionals are overall more or less interested in addictions training than other groups of social workers.

Further study in this area would be informative for the profession, helping to determine if the training interests of rural social workers differ from those of their urban counterparts. It is advisable that the full ITN be deployed, including the adequacy scale. Even if doing this had decreased the response rate by 20%, this would still have yielded a response rate in excess of 55%, which many researchers find very acceptable for direct-mail survey research. Nonetheless, this population did express a strong interest in addiction training as evidenced by the high response rate to the survey, and the detailed items responses may be drawn upon to inform the responsiveness of social work education to this community's training needs.

This study supports Vander Bilt, Hall &, Schaffer's (1997) conclusion that the scale is a valuable and flexible tool for educational planners. Although limited to a single domain of training interest, this Index of Training Need scale has nonetheless proven to be an effective, adaptable, and a much needed single factor quantitative measure of professional addiction training needs.

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