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Utility of the Scientist-Practitioner Inventory in Counselor Education

Abstract

This study examined the construct validity of the Scientist-Practitioner Inventory (SPI) modified for counseling profession to determine if S-P orientation could be assessed through mSPI. The mSPI was administered to masters' students, practicing counselors, doctoral students, and faculty members in counselor education programs. The results showed that the mSPI has adequate construct and significant differences among groups. Implications for integrating S-P model in counselor education curriculum design, training, advising, and classroom teaching are discussed.

Keywords

scientist-practitioner model, counselor education, scientist-practitioner inventory

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The scientist-practitioner (S-P) model has been endorsed as a training model by many graduate education programs for helping professions, including counselor education (Borders & Bloss, 1994; Petersen et al., 2016), counseling psychology (Myers, 2007; Ridley & Laird, 2015), marriage and family therapy (Crane et al., 2002), social work (Rosen, 1996), and other related educational programs in human services (Belar & Perry, 1992; Tanner & Danielson, 2007). This model of education and training is an "integrative approach to science and practice wherein each must continually inform the other" (Belar & Perry, 1992, p. 72), with an aim to enhance counselor training and ultimately clinical practice (Myers, 2007). The S-P model is widely accepted as a training standard for helping professional programs internationally as well (Leong et al., 2013; Vespia & Sauer, 2006).

In considering the context of the field of psychology in 1949, the S-P model developed as a result of the politics of the time. In post-World War II America, an enormous need emerged for mental health care for veterans returning from war (Frank, 1984). According to the author, psychiatrists and psychologists worked together to face this growing need; however, they were not seen as equal partners. As a result, Frank (1984) asserted that a research component needed to be added to legitimize the profession of psychology and to "free the clinical psychologist from complete domination by the psychiatrist" (p. 426). Stone (2006) stated that the S-P philosophy and rhetoric helped graduate programs align their curriculums to be equivalent to other scientific education programs. In doing so, they gained access to the scientific community.

Following the Boulder Conference on in 1949 (Benjamin & Baker, 2000), the S-P model was chosen for graduate training in mental health profession (Petersen, 2007). This endorsement emphasized that mental health professionals should be both a researcher and a practitioner. Practitioners have ethical obligation to serve clients with most effective treatment modalities and

accordingly should be capable of evaluating existing literature and their own data to determine which treatment works best to which specific clientele (Petersen, 2007). The fundamental ideas of S-P model are that helping professionals need to be knowledgeable and skillful in both research and practice so that they can conduct and evaluate research in clinical settings for better clinical practice and failure to integrating the two in training would have missed the purpose of S-P model (Jones & Mehr, 2007). The benefits of applying in S-P model in training of counselors are multiple; the program increased the possibility of educating entry-level counselors to become competent in research and then utilize evidence-practiced practice; faculty members felt their identity as a scholar and practitioner were reinforced in their work settings and eventually helped them to enhance training of future counselors (Barraclough, 2006; Haring-Hidore & Vacc, 1988; Spengler & Lee, 2017).

Even with endorsement as standard training model and benefits to practice, challenges exist to fully implement S-P model in graduate training. Historically, a gap has existed between research and practice (Hays et al., 2019; Horsfall et al., 2011). At the root of the discussion, a division exists between those doing the research and individuals working in the field. Some authors have expressed dissatisfaction in the utilization of research by clinicians throughout the years (Gelso, 1993; Nathan, 2000; Rosen, 1996; Zachar & Leong, 1992). On the other side, practitioners doing clinical work in the field, do not necessarily find that the research published in academic journal have little application to their daily practice (Stricker & Goldfried, 2019). A gap also exists in the reward system in clinical and academic settings, leading faculty members to focus more on publishing and practitioners no time to engage in research activities (Mellott & Mehr, 2007; Stoltenberg et al., 2000). As a result, some counselor training programs have chosen to have more of a practitioner emphasis– a practitioner-scholar (P-S) approach while others might have an

emphasis on research–a scholar-practitioner (Stoltenberg et al., 2000). For some in the helping professions, the S-P model focuses too much on a positivistic view of knowledge (Chwalisz, 2003). Hosmand and Polkinghorne (1992) specified that the positivistic model of science implies a one-way relationship between theories tested by research and practice placing practitioners in a secondary role of "appliers" rather than "contributors" of knowledge (p. 56). Further, Austin et al. (2012) asserted that many research courses are taught without practice in mind, resulting in students having "a limited appreciation of research or a negative perception of its relevance to practice" (p. 176). These challenges compromised the goal of an ideal integrated S-P training model as argued by the proponents of S-P model.

Despite the controversies, Stone (2006) suggested a broader S-P model for the new generation of practitioners. This approach calls for "incorporating different training models, diverse methods of scientific inquiry, multiple sources of evidence, and expanded range of valued scientific activities" (Stone, 2006, p. 310). For a true interdependent relationship between science and practice, collaboration is necessary. Recently, scholars proposed true integration of science and practice by conducting research in clinical settings and a partnership with practitioners for research training in the curriculum (LeJeune & Luoma, 2015; Hays et al., 2019).

Students enter graduate programs for a variety of reasons with most of them probably having more interest in helping people rather than interest in research (Kahn & Scott, 1997). Thus, students may be more characteristically interested in the practitioner aspect without an equal aspiration in research (Mellot & Mehr, 2007). Therefore, for students with a greater interest in providing direct service to clients, a curriculum that is more practitioner-focused may be preferred. The practitioner-scientist model focuses on cultivating an understanding of scientific approaches to complement students' pre-existing interests in counseling practice (Chwalisz, 2003; Meier,

1999) and views research activities in the context of how it will inform practice (Stoltenberg et al., 2000). Students entering counseling master's programs to work as a counseling practitioner and not continue into a doctoral program, probably can benefit from P-S training model. Whereas for counselor education doctoral students, an S-P aligned graduate program focused not only on research and clinical training, but also on the integration of the two to generate scholarship would likely be more beneficial (Peterson & Park, 2005). Doctoral programs in counselor education provide graduates with advanced skills in clinical practice, supervision, research and professional scholarship, leadership, and teaching (Altekruse, 1991; West et al., 1995; Zimpher et al., 1997). Doctoral graduates may continue clinical practice, serve in leadership positions within the profession, and/or seek employment as faculty members in counselor education programs. In any case, students who aspire to become counselors, in their consideration of graduate school, can gain insights if they are provided opportunities to discover their orientation on the scientist-practitioner continuum. Similarly, an understanding of their S-P orientation would be helpful in choosing a graduate program given each program has its unique training characteristics that should fall somewhere on the continuum.

Although research training is required by CACREP (2016) and ACA ethical codes (2014), practicing counselors across different specialty (e.g., mental health counseling, school counseling, etc.) view research skills training as highly needed for their professional work (Peterson et al., 2016), and a list of research competencies were identified (Wester & Borders, 2014), there is no measurement about scientist-practitioner orientation for counseling profession. A tool of assessing S-P orientation would be helpful for advising and understanding how the S-P model could be implemented in counselor training programs. The SPI was originally designed to be used with psychology students to measure scientist and practitioner interests (Leong & Zachar, 1991). The

SPI has been found to be reliable and valid in assisting psychology students in career specialty exploration (Leong & Zachar, 1993; Zachar & Leong, 2000); however, it is not known whether this instrument would be equally useful for counseling students and the counseling profession as a whole. Therefore, the purposes of this study were to modify the SPI for the counseling profession and to examine the construct and criteria validity of Modified Scientist-Practitioner Inventory (mSPI) for counseling students and professionals. The specific research questions are: 1) Will the Scientist and Practitioner dimension of the mSPI be supported as in the original SPI? 2) Will the mSPI score difference of S and P exist among various counseling professionals? A factor analysis was utilized to examine the construct validity of mSPI; and ANOVA was performed to determine whether faculty members and doctoral students show a significantly higher scientist orientation than practicing counselors and master's students.

Method

Participants

The participants for this study composed of Master's and doctoral students in counselor training programs, practicing counselors, and faculty members in counselor education programs. Eligible participants were (a) enrolled in counselor education programs at either the master's or doctoral level, (b) teaching in counselor education programs as tenure-track or tenured faculty members, or (c) practicing counseling in the community or schools. This varied sampling pool was purposefully targeted for wide and balanced representation of counseling professionals who may show varied interests in scientist and/or practitioner orientation. It is expected that Master's students and practice counselors would have more interests in P and doctoral students and faculty members would have more interests in S. Survey collection was anonymous, and identifying information was not collected.

There were 274 participants consisting of 66 (24.1%) master's students, 40 (14.6%) doctoral students, 51 (18.6%) faculty members, and 177 (42.7%) practicing counselors. The majority of the participants was Caucasian (88.7%); followed by African Americans (4.7%), Hispanic Americans (2.2%), Multiracial backgrounds (2.2%), Native Americans (1.1 %) and Asian Americans (.4%). The age distribution was as follows: 20.5% of the participants were in between 22 to 30 years old, 24.1% between 31-40, 19.9% between 41-50, 27.2% between 51-60, and 7.8% of them were at 61 or older.

Measurement

The research team created the mSPI and a demographic questionnaire. The original SPI was developed by Leong and Zachar (1991) and was tested for its reliability and validity with psychology students. There are two dimensions respectively for scientists and practitioners. The SPI items describe 42 common activities performed by scientists and practitioners with 21 items for each dimension. The scientist dimension is divided into four subscales: Research Activities, Teach/Guide/Edit, Academic Ideas, and Statistics and Design. The practitioner dimension has three subscales: Therapy Activities, Clinical Expert/Consultant, and Tests and Interpretation. The original SPI has the alpha reliability score of the Scientists scale at .85 and .93 for the Practitioner scale (Leong & Zachar, 1991). Construct validity was determined by correlating the two scales of the SPI with two personality types in Holland's personality typology (Leong & Zachar, 1991). There was a significant positive relationship between the Scientists scale and the Investigative personality type of Holland's theory (0.54) and a negative significant relationship between Investigative with the Social personality type (-0.35). Similarly, the Practitioner scale had a negative significant relationship with Investigative (-0.34) and a positive significant relationship

with the Social personality type (0.62). These scores indicate that the SPI has solid construct validity.

The modification of SPI involved two steps. First, the wording of the original instrument was modified to fit a counseling audience. For example, “Consulting with other psychologists about a particular client’s concerns” was changed to read “Consulting with other counselors about a particular client’s concerns.” All of the activities for scientists and practitioners remained the same but some contained slightly different wording. The second step involved an independent rating by the research team to place each modified item in either the Scientist or Practitioner category. The ratings by the research team were examined for inter-rater reliability using Fleiss’s Kappa, which is a statistical measure for determine the reliability of agreement between raters when classifying items (Fleiss, 1971). The five research team members independently rated the mSPI items to either Scientist or Practitioner and the Fleiss’s Kappa analysis showed reliability coefficient K at .78 (in the category of substantial agreement). The final classification by the group was consistent to the original subscales; therefore, the same subscales were used in the modified version. The reliability of mSPI yielded a Cronbach’s Alpha at .91.

The demographic questionnaire was developed by the research team to collect information on participants’ general demographic backgrounds. Educational level, racial background, and current position (faculty, clinicians, master’s students, and doctoral students) were collected. Researchers also asked participants what their ideal occupation would be (e.g., clinician, administration, faculty, and consultant.

Procedure

Following obtaining permission to proceed with the research project from the Institutional Review Board, data was collected through an online survey tool. The research team utilized

listservs and email databases of various professional organizations for survey distribution. Two databases consisting of licensed counselors of a Midwestern state, one for mental health counselors, and one for school counselors, were used for soliciting practicing clinicians. In addition, two listservs targeted specific participants: COUNSGRADS for graduate students in counselor training and the CESNET for both counselor educators and graduate students. Researchers sent the invitation letter with informed consent information and a link to the survey to these databases and listservs via recruitment email. A reminder email was sent to the sampling pool at the beginning of the third week after initial recruitment email was distributed. Because there was no accurate figure of the subscribers to the listserv or database of licensees, the exact return rate was unknown.

Data Analysis

The data was screened for missing data and normality. The cases with over 50% of the responses missing were removed from the final data analysis, resulting in a sample of 240 valid cases for factor analysis. For the retaining cases, the missing data was replaced with the mean. The number of variables to the number of participants yielded 1 to 5.7, which is in the range of subject to variables ratio by most exploratory factor analysis studies—1 to 5 or less (MacCallum et al., 2001; Osborne & Costello, 2004). Although the larger the sample size, the better is it for avoiding error, MacCallum et al., (2001) stated that a smaller sample size than traditionally recommended was likely sufficient when commonalities are high. The normality was checked using the Shapiro-Wilki test and indicated that data set could not be assumed for normality. An exploratory factor analysis was conducted to examine the construct of the revised Scientist-Practitioner Inventory for counseling profession. The maximum likelihood was chosen for extraction method because it allows for testing goodness of fit of the model to the data as well as correlation among factors

(Fabrigar et al., 1999). The Bartlett's Test of Sphericity was found significant with x^2 = 5363.55 at <.001; therefore, it confirmed that suitability of the dataset for factor analysis. The exploratory factor analysis with maximum likelihood extraction method was performed on all 42 items of mSPI. The KMO yielded the score at .9, indicating the adequacy of the sample. Because the factors were likely to correlate based on the original SPI's results, the oblique rotation method was chosen.

It is expected that faculty members and doctoral students would have higher scores on Scientist orientation and that practicing counselors and master's students would score higher on Practitioner orientation. To investigate whether participants have differences in regard to Scientist and Practitioner subscale on mSPI, one-way ANOVA was performed. Four groups were compared on two subscales to determine whether there is a difference and the differences are in the expected direction.

Results

The initial factor analysis results generated 9 factors with eigenvalue at or above 1.00, accounting for 65.2% of the total variances. The details are listed in Table 1.

Table 1

Initial Factor Analysis of mSPI

Factor	Eigenvalue	% of Variance	Cumulative %
1	10.943	26.055	26.055
2	5.903	14.055	40.11
3	2.252	5.362	45.472
4	1.821	4.336	49.808
5	1.66	3.953	53.761
6	1.41	3.356	57.117
7	1.276	3.039	60.155
8	1.083	2.58	62.735
9	1.001	2.385	65.12

The commonalities of each item were ranged from .38 to .80. Using the Kaiser's rule, all

the factors with eigenvalue equal or above 1.00 should be retained; however, there are 3 factors that only have two variables, which is against the rule of at least 3 variables in each factor (Costello & Osborne, 2005). The scree plot indicated that there was a clear turn at the three factors (see Figure 1).

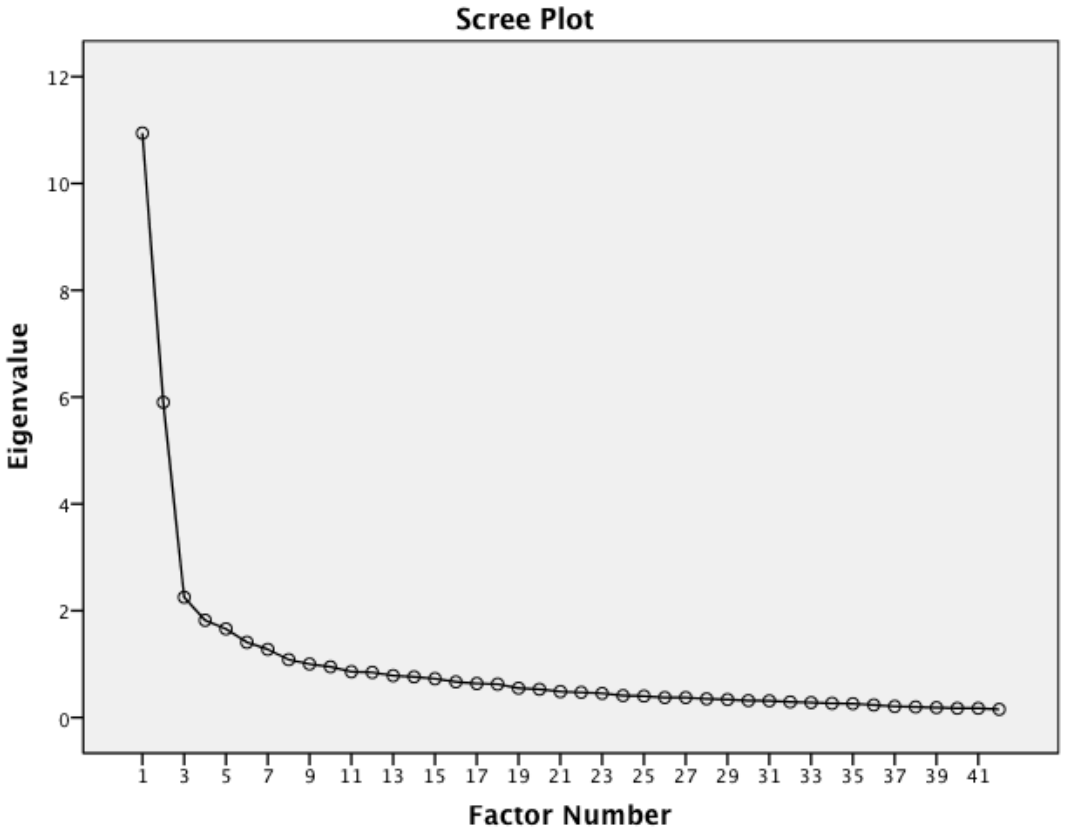

Figure 1: Screen Plot of Factor for Factor Analysis

Based on the suggestion of Costello and Osborne, one above and one below scree suggested numbers of factors should be run, therefore, three further factor analysis were run at 2, 3 and 4 factors. Following the rule suggested by Costello and Osborn for the cleanest factor structure, i.e., the factor loading above .30, no or few items crossloadings, no factors with fewer than three items, and taking the variance explained into consideration, the 4 factor structure emerged as the best fit

with 49.81% of variance explained, compared to 40.11% of variance accounted by 2 factor structure. It also shows lower number of crossloadings of three items; there are 3: “Planning a behavior modification program for a client”, “Reviewing an agency’s intake form for a new client”, and “Giving advice on mental health concerns on a talk show.” Therefore, the four-factor structure was determined to be an optimal model. The factor loadings of each item are shown in Table 2. It is noticed that the items with the highest loading for factor 1 are: “Writing research papers for publication,” “Serving on thesis or dissertation committee,” and “Consulting on data a research project”; other higher loading for this factor also aligned with the original SPI’s subscale for scientist orientation. For factor 2, the items with the highest loading are “Conducting a therapy session with an individual client,” “Conducting a group therapy sessions,” and “Learning new strategies to deal with mental health concerns.” The item with higher loading on factor 3 is administering an assessment test to a client. The items with highest loading on factor 4 is “Designing a new treatment program in a mental health facility” and “formulating a theory of a therapeutic approach.” One item “Consulting with school personnel about a new prevention program” has below .3 factor loading.

The original SPI has equal 21 items for Scientist and Practitioner subscale respectively. The Scientists subscale has all the items from Factor loading 1. All the remaining factors have the theme of clinical services and seem more like items for practitioner subscale in the original SPI, except the two items “Reviewing literature on an issue in counseling” and “Formulating a theory of a therapeutic approach” which were part of the Scientist subscale. Examining the content of these two items, it was decided that they could be grouped with Practitioner subscale. The internal consistency of these revised two subscales was examined using Cronbach’s alpha. The results showed that the subscale scientist had .908 and practitioner subscale had.85, which is above the

conventional acceptable level at .70.

Table 2

Final Factor Loading for mSPI Item

	Factor			
	1	2	3	4
Writing research papers for publication	**0.86**	0.03	-0.35	-0.27
Consulting data on a research project you designed	**0.81**	-0.05	-0.07	-0.26
Brainstorming about possible research studies with colleagues	**0.78**	0.02	-0.08	-0.25
Writing an article commenting on research findings	**0.77**	-0.06	-0.31	-0.19
Serving on a thesis or dissertation committee	**0.77**	0.06	-0.31	-0.25
Analyzing data from an experiment you have conducted	**0.77**	-0.07	-0.12	-0.11
Presenting research findings at a conference	**0.74**	0.03	-0.29	-0.34
Supervising students' research projects	**0.74**	0.01	-0.17	-0.22
Learning about new statistical procedures	**0.73**	-0.07	0.31	-0.18
Designing an experiment to study a therapeutic process	**0.72**	0.09	0.03	-0.50
Helping a colleague understand confusing statistical findings	**0.71**	-0.12	0.22	-0.18
Developing new explanations of well accepted empirical studies	**0.69**	-0.01	0.03	-0.38
Reading a book on innovative research designs	**0.68**	-0.03	0.08	-0.22
Serving as an editor for a scholarly journal	**0.67**	-0.09	-0.27	-0.24
Writing a scholarly book for helping professionals	**0.61**	0.03	-0.46	-0.40
Working for a funded research institute	**0.61**	0.13	0.11	-0.33
Applying for research grants	**0.58**	0.05	-0.04	-0.25
Reviewing journal articles	**0.56**	0.13	-0.18	-0.19
Writing a statistical program	**0.53**	-0.14	0.26	-0.13
Conducting a therapy session with an individual client	-0.12	**0.66**	0.32	-0.28
Conducting group therapy sessions	0.02	**0.58**	0.18	-0.28
Learning new strategies to deal with mental health concerns	-0.02	**0.58**	0.26	-0.42
Attending a conference on counseling techniques	-0.09	**0.57**	0.17	-0.18
Helping a client get in touch with feelings	-0.28	**0.57**	0.24	-0.11
Consulting with other helping professionals about a particular client's concerns	-0.17	**0.56**	0.32	-0.23
Conducting a diagnostic interview with a client	-0.19	**0.56**	0.41	-0.29
Reading a book written by a well-known helping professional	0.11	**0.53**	0.01	-0.26
Reading about new approaches to therapy	0.12	**0.52**	-0.01	-0.27
Reviewing the literature on an issue in counseling	0.31	**0.47**	-0.03	-0.23
Conducting couples and family therapy	0.03	**0.47**	0.05	-0.29
Going through therapy to make yourself a better person	0.01	**0.42**	0.06	-0.22
Administering an assessment test to a client	-0.05	0.28	**0.54**	-0.12
Planning a behavior modification program for a client	-0.19	0.42	**0.46**	-0.19
Interpreting/processing a test battery with a client	0.10	0.25	**0.43**	-0.16
Reviewing an agency's intake form for a new client	-0.11	0.38	**0.38**	-0.19
Designing a new treatment method for a mental health agency	0.27	0.25	0.14	**-0.85**
Organizing a treatment program in a mental health facility	0.15	0.36	0.18	**-0.76**
Formulating a theory of a therapeutic approach	0.29	0.21	-0.18	**-0.58**
Presenting a report during a case conference	0.41	0.34	-0.08	**-0.50**
Supervising practicum students in clinical counseling programs	0.28	0.27	-0.06	**-0.40**
Giving advice on mental health concerns on a talk show	0.08	0.30	0.01	**-0.38**
Consulting with school personnel about a new prevention program	0.16	0.12	0.09	**-0.17**

To examine whether the mSPI could distinguish the four groups as expected, i. e. the practicing counselors and master's students would have more inclination to practitioner orientation than the doctoral students and faculty members in counselor education programs; and the latter two groups were more inclined to have higher scientist orientation. The group differences were examined by one-way ANOVA. The results showed that group differences did exist among master's students, doctoral students, faculty members, and clinicians, $F(3, 270) = 24.5$, $p>.001$($\eta^2 = .24$) for S, and $F(3, 270) = 6.23$, $p>.001$($\eta^2 = .07$) for P. The means and standard deviations are illustrated in Table 3 with F scores and effect sizes. As expected, the higher means of Scientist subscale were found for both faculty members and doctoral students; and higher mean score was found for clinicians and master's students in Practitioner subscale. Such pattern of group mean differences illustrate that faculty and doctoral students have higher scientist-oriented interests than clinicians and counseling master's students as expected. Therefore, this result provided preliminary evidence that the mSPI could be used as a tool to identify Scientist-Practitioner orientation among counseling professionals.

Table 3

Group Difference Among Participant Groups

Subscale	Master's Students		Doctoral Students		Faculty		Clinicians			
	M	St. D.	M	St.D.	M	St. D.	M	St. D.	F	η^2
Scientist (19)	2.58	.90	3.43	0.73	3.42	.76	2.4	.76	24.5**	.24
Practitioner (23)	3.8	.47	3.63	.48	3.37	.36	3.6	.56	6.23**	.07

*.Note.***p <.001*

Discussion

The S-P training model has been prevalent in many professional graduate training programs in the helping professions. The S-P model has been adopted as a necessary and applicable training model widely by helping professional graduation including counselor education (Belar & Perry, 1992; Border & Bloss, 1994; Petersen et al., 2016). Despite the widespread acknowledgement of S-P benefits to training counselors, few studies have investigated its application in counselor education. Researchers modified the Scientist-Practitioner Inventory (Leong & Zachar, 1991) with an aim to examine its utility for counselor education, specifically, to explore whether mSPI could be a valid assessment tool to help graduate students explore and identify their S-P orientation. Counselor education programs have two tiers of training: a master's program focusing more on practice with the goals of gaining a professional license, and a doctoral program focusing more on scientific inquiry and training future faculty members. Accordingly, it is expected that practitioners are more likely to be interested in providing therapy and gaining clinical expertise while counselor educators are more inclined to teach and research. The original SPI was developed for psychology students to explore their career specialty within psychology field. This study modified the SPI and examined its reliability and validity to the counseling profession.

The results of explorative factor analysis of the mSPI found that the structure of Scientist and Practitioner dimension did exist for the counseling profession. The EFA resulted in four factor solution; the examination of the first factor loading shows identical items to the Scientist subscale and the rest of the three factors are similar to the other items belonging to Practitioner subscale of the original SPI. The two items "Reviewing literature on an issue in counseling" and "Formulating a theory of a therapeutic approach" showed different factor loading than the original SPI, with

both items being part of the Practitioner subscale than the Scientist subscale. This change could mean reviewing literature could be perceived either as steps for conducting research or as ways of looking for ideas for therapeutic enhancement. Similarly, formulating a theory may involve developing a new framework for enhancing their clinical work or testing an innovative approach or intervention for validity. It seems that the counseling profession tends to perceive these two items as more in alignment with practitioner orientation, rather than scientist orientation. Thus, these two items might be interpreted differently by different audiences, and may not be viewed the same way for the counseling profession.

The results showed significant differences on two subscales among 4 groups of participants as expected, i.e., faculty and doctoral students showed more interests in Scientist subscales than practitioners and master's students. The effect size for the Scientist subscale is at the medium level, indicating the robustness of the differences; however, the effect size for the Practitioner subscale is small, which should alert one to avoid making broad generalizations. It is also noticed that all groups had similar interests in the practitioner subscale (ranging from 3.37 to 3.8), compared to Scientist subscale with much larger range (2.43 to 3.43). Given that counselor educators are counselors as well (or at least by training and professional orientation), it is not a surprise that faculty members and doctoral students would have preferences for both research and counseling practice.

Limitations and Future Research

There were several limitations to the present study. The sample might not be representative of the population of counseling students and professionals. There were more practitioners and students represented in this particular sample than faculty members. Not all the demographic information was collected and some of them are probably very useful to data analysis and

interpretation, such as gender and work settings. Gender may be an important factor for exmaination given that previous research has found gender to play a role in research interest and research self-efficacy (Kahn & Scott, 1997); however, gender was not found to be a factor in a study examining scientist and practitioner interests of doctoral students (Martin et al., 2007). The nonresponse rate is unknown as well. The future study could recruit a more representative sample through targeted sampling pool such as specific divisions of the ACA membership directory. The sample size is small and a larger sample size would be necessary for stability of factor loading resolution and generalizability. Though the study found sound psychometric properties of this modified SPI, the reliability was not based on multiple time intervals, nor is concurrent validity is measured. The future study can address these limitations by administering instruments at time intervals alongside other similar instruments deemed as reliable and valid tools for measuring the same or similar constructs. Future research could address long-term stability of career specialty interests, especially for students moving from master's programs or clinical work into doctoral programs in Counselor Education.

Implications for Counseling Counselor Education

The mSPI could potentially provide useful information for graduate students, practitioners, and counselor educators in regard to exploring educational and career choices. The mSPI may be helpful for students seeking graduate study in the helping professions by indicating a potential fit between a master's program with a focus on practitioner training or a doctoral program with more expectations for research training. It could also be useful for graduate students upon graduation as they explore options for employment or pursuing doctoral studies. Counselors can use this instrument to identify their orientation towards S-P continuum and choose work style and setting based on their preferences.

For counselor education programs, awareness of programs' preferences on the scientist and practitioner continuum would be helpful to determine program mission and characteristics. For instance, while it is equally important to have training on both aspects, the program could decide to focus more on one clinical practice if the goal of the program is to train future clinicians; and to enhance the research training beyond the minimum accreditation standards if the goal of the program is to prepare future faculty members. In the same vein, the counselor education programs can also use this inventory to increase student awareness in regard to their own career pursuit so that they can optimize their learning experiences and best fit their interests. Prior to admission, the mSPI could be especially helpful in understanding students' interests and preferences. It is possible to take advantage of this inventory when assisting students in finding a good program fit. In regard to teaching strategies, counselor educators could incorporate S-P model through variety of efforts. For instance, emphasizing critical thinking and use of scientific methods in discussing case conceptualization and treatment evaluation in teaching clinical courses (Myers, 2007) could provide students opportunities to apply evidence-based practice. Some scholars also suggested that counselor education programs should partner with clinical settings and infuse research training across all foundation classes (see Hays et al., 2019), teach research methods that are prone to clinical practice, e.g., singe case study design, and encourage faculty members to model the S-P integration in fulfilling their roles (Stoltenberg & Pace, 2007).

Conclusion

This study examined the validity and application of the mSPI to understand preferences of masters' and doctoral students, counseling practitioners, and faculty members in regard to scientist and practitioner orientation. The findings support the construct and criteria validity of the mSPI for counseling profession. The mSPI could be a useful tool for counselors and graduate students

in counselor education programs to explore their orientation on the S-P continuum and advising tool for graduate program choices. Counselor education programs could integrate science and practitioner model in curriculum design and/or revision to better prepare future counselors and counselor educators for implementing S-P approach in clinical or educational settings.

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