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- Reactions

Two Decades of Research on the Problem Solving Inventory A Call for Empirical Clarity

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Heppner, Witty, and Dixon's review of 2 decades of research on the Problem Solving Inventory (PSI) provides highlights of more than 120 studies relating problem-solving appraisal to psychological adjustment, physical health, coping, and educational and vocational issues. Although clearly an impressive body of literature, the level of data reported is uneven with attention to effect sizes (e.g., correlations) and sample descriptors (e.g., race/ethnicity, n size, gender). Acknowledging the importance of the PSI and this major review, we provide commentary on the need for a meta-analysis and the continual expansion of research on the PSI with respect to diversity issues (i.e., race/ethnicity, gender).

Heppner, Witty, and Dixon (2004 [this issue] report in their review that the Problem Solving Inventory (PSI) (Heppner, 1998) can be used to assess problem-solving appraisal as well as generate information that can be used in the diagnosis, treatment, and evaluation of service delivery for clients with a range of psychological problems. The impressive body of literature that has evolved in the past 2 decades attests to the importance of this instrument. The PSI appears to perform in expected directions in relation to all of the psychological constructs examined (i.e., psychological adjustment, physical health, coping, and educational and vocational constructs), providing support for the validity of this instrument with respect to diverse client needs.

Our assessment of this important work focuses on the following two areas of need: applying meta-analytic procedures to empirically examine the effect sizes yielded by the studies and continued attention to diversity issues as recommended by Heppner et al. (2004).

APPLICATION OF META-ANALYTIC PROCEDURES

Table 1 provides a synopsis of empirical data gleaned from the review by Heppner et al. (2004). The areas delineated by the authors are provided along with the reported number of studies, description of samples, range of effect sizes when reported, and quoted summary statements from the text. It should be noted that the effect sizes were based on correlations indicated in the review. Cohen (1988) provides a general guide in evaluating effect sizes of sample weighted average correlations; $r = .10$ is a small effect size, $r = .30$ is a medium effect size, and $r = .50$ is a large effect size. Based on our perusal of the data provided, most of the correlational effect sizes reported fall within the medium to large range. This supports the usage of the scale and its measured relationship with respect to a variety of psychological constructs. It is important to note that the distinctions of small, medium, and large “refer to the size of the effect, but not necessarily to its importance” (Murphy & Myers, 2004, p. 14). Although many criticize the use of meta-analytic procedures because they gloss over study differences, in the case of the PSI, it is clear that such analysis would provide better estimates of the overall relationship of scores on this measure to various psychological phenomena. The summary statements made by Heppner et al. (2004) are difficult to interpret given the absence of the empirical data and criteria on which these conclusions are based. For example, as indicated in Table 1, what constitutes a “strong” relationship versus an “association” is unclear. In their review, 4 areas are identified to have a “strong” relationship (i.e., overall psychological adjustment, depression, anxiety and worry, and coping); 11 areas are “associated” with problem-solving appraisal (i.e., general and social, eating disorders, childhood trauma, physical health, health complaints and promotion, physical health complications, reports of coping activities, using social support and social/political resources, and benefiting from applied interventions). Although some may say that these summary statements are only minor details, an effect size analysis could provide potentially greater support to a more complete understanding of the relationship between problem-solving appraisal and the psychological constructs identified by Heppner and colleagues (2004). Given the expanse of their PSI review, the authors are in a prime position to continue their work and move toward a comprehensive analysis.

APPLICATION TO DIVERSE SAMPLES

Table 1 also contains descriptions of the study samples provided by Heppner et al. (2004). Seven of the 18 researched areas comprise primarily

TABLE 1: Effect Sizes for Studies on the Problem Solving Inventory (PSI) as Reported by Heppner, Witty, and Dixon (2004)

<i>Area</i>	<i>Number of Studies</i>	<i>Samples</i>	<i>Range of Effect Sizes</i>	<i>Summary Statements</i>
Psychological adjustment General and social	NR 24	NR Primarily White college students; African American (2); Canadian (1)	NR None reported	"strong association" "well-established association"
Depression	35	Wide range of populations; Turkey (1); South Africa (2); Canadian (1); Chinese (1); college students (8)	.30-.60 (23); .41-.67 (8)	"very strong empirical support"
Hopelessness and suicidality	12	College students (4); special/non-clinical (2); clinical (6)	.47-.62 (Hopelessness); .11-.43 (Suicide Ideation)	"problem-solving appraisal is a significant predictor"
Anxiety and worry	9 (Anxiety); 5 (Worry)	Predominantly White college students (7); Turkish (1)	.45-.51 (trait anxiety); .35-.42 (state anxiety)	"strong relationship"
Alcohol use/abuse	6	College students (5); inpatient alcoholics (1)	NR	"suggest more complex relationships"
Eating disorders	3	U.S. (2) and Italian (1) samples of women	NR	"associated"
Childhood adjustment	4	Culturally diverse U.S. women (1); Black South African women (1); all mothers or dyads	NR	"may be related"
Childhood trauma	4	ACA and non-ACA college students (2); adolescent incest victims (1); adult women sexually abused and nonabused (1)	NR	"may be associated"
Instrumentality and expressiveness	5	NR	NR	"more complex relationships"
Physical health	At least 13	NR	NR	"associated"

(continued)

TABLE 1 (continued)

<i>Area</i>	<i>Number of Studies</i>	<i>Samples</i>	<i>Range of Effect Sizes</i>	<i>Summary Statements</i>
Health complaints and promotion	8	Rural adolescent women (1)	NR	"associated," "related"
Physical health complications	1	Patients in a medical setting	NR	"associate" the Approach-Avoidance style with health outcomes
Traumatic brain injury (TBI)	4	TBI adults and noninjured adults (3)	$d = -.90$ (differentiated TBI from normal) (1)	PSI was "the most successful measure to differentiate brain injured adults from non-injured adults . . . [and] the best predictor of community integration"
Coping	NR	NR	NR	"strongly associated"
Hypothetical or laboratory problem solving	9	Teacher trainees (2)	.46 (numbers of errors and avoidance scores)	"there does seem to be a relationship"
Reports of coping activities	12	Primarily White college students; U.S. racial/ethnic minorities (1); Canadian adults (1)	NR	"well established association" (10)
Help seeking and using helping resources	NR	NR	NR	NR
Help seeking from university resources	3	Predominantly White college samples in the Midwest	NR	"seems to be related to some aspects"
Utilizing social support and social/political resources	7	Spinal cord injured adults (1)	NR	"associated . . . related," "appears to be linked"

Benefiting from applied interventions	6	Primarily White college students and adults; family caregivers of stroke survivors (1)	NR	NR	“associated”
Educational and vocational issues	NR	NR	NR	NR	NR
Intelligence, academic ability, academic performance, educational level, and age	9	NR	NR	-.31-.15 (intelligence and academic aptitude); -.34 (education level)	“problem-solving appraisal was not found to be significantly related to measures of intelligence and academic aptitude but is related to test anxiety, education level, and age”
Career planning and decision making	13	Predominantly racial/ethnic minority applicants to medical school (1); secondary public school in Jordan (1)	NR	NR	“related”

NOTE = NR = not reported; ACA = American Counseling Association.

studies of college students. Although this is not unusual in the psychological arena, the use of samples of convenience (i.e., those easily accessible to researchers) constitutes a significant limitation. Camp (1989-present) and LoBello (1989-present) both comment in their critiques of the PSI on the need for larger and more diverse (i.e., nonstudent) samples to increase the adequacy of the normative data. In addition, as the authors note, many of the samples were also predominantly White. Thus, Heppner et al. (2004) express caution in applying these findings to diverse populations. It would be helpful to conduct studies using the PSI with racially/ethnically marginalized groups and noncollege populations. In addition, socioeconomic status and sexual orientation should also be considered in future research.

Heppner and colleagues (2004) also present important cultural issues to consider in conducting future research. They point out, for example, that Asians may undervalue their own problem-solving effectiveness because of the value they place on humility. It should be noted that an array of factors including acculturation and educational level may influence this value.

There is a need for a better understanding of the psychometric properties and application of the PSI to racially and ethnically diverse groups. In the following sections, we discuss racial and ethnic identity, independence/individuation, contextual factors, and gender as areas where further exploration may be pursued.

Racial and Ethnic Identity

Heppner et al. (2004) report that in studies that examined the relationship between problem-solving appraisal and general indices of psychosocial adjustment, only one study addressed racial identity (i.e., Neville, Heppner, & Wang, 1997). That study's findings indicate that perceived ineffective problem solvers (as measured by the PSI) also appear to be less adjusted on measures assessing racial identity statuses among an African American sample. This finding provides evidence of a more complex relationship between racial identity and problem solving.

Examining the relationship between the PSI and ethnic identity may yield important information. For example, one may look at bicultural and biracial populations to see whether problem-solving appraisal is related to ethnic identity stages or statuses. Understanding how problem-solving appraisal relates to ethnic identity may help us gain clarity on issues related to identity negotiation. Biracial and bicultural populations may at times have to make choices when they are presented with two or more competing cultural norms.

Independence and Individuation

In the PSI manual, Heppner (1988) states, "The purpose of the Problem Solving Inventory (PSI) is to assess an individual's perceptions of his or her own problem-solving behaviors and attitudes" (p. 1). The PSI appears to assess perceptions of an independent and autonomous way of problem solving in which the individual makes a decision with his or her goals and interests primarily in mind and without the assistance of others (e.g., family and community). In some cultures, however, problem solving could be an interdependent phenomenon. Researchers have suggested that Asian cultures are less focused on independence and autonomy and instead emphasize interdependence and collectivism (Markus & Kitayama, 1991). In Asian cultures, for example, decision making may be done collectively through consultation with others, and therefore, problem-solving would not be autonomous. At times, individuals also make decisions based on their position in a familial and societal hierarchy. If we assess problem-solving appraisal through the PSI with its current scoring and without taking into account cultural issues involved in psychological development, we could be incorrectly gauging individuals' perception of their own problem solving. In the example of Asians, we would be interpreting high PSI scores as negative problem-solving (they perceive themselves as ineffective problem solvers) when that may in fact not be the case. For example, the study by Fraser and Tucker (1997) suggests that perceived ineffective (as measured by the PSI) problem solvers report themselves to be less adjusted on measures assessing individuation from parents. Therefore, the question may come to mind, How would the PSI work in cultures where individuation from parents is not a goal in the same way that it is for some groups in the United States?

Similarly, issues of independent problem solving arise with respect to career planning and decision making. Many career development theories focus on the individual (Herr, 1987). These theories would not be an accurate conceptualization of work and career decision making for those whose core value is an interdependent self. In that case, individuals may not wish to plan and choose a career on their own. Instead, they may make these decisions in consultation with others. These individuals may not be thinking about the best career choice for themselves personally but rather would be focusing on the needs and desires of the family. For example, the career choice of Indian immigrants is heavily influenced, if not dictated, by the family (Segal, 1991).

Heppner (1988) reports, "The PSI reflects the individual's awareness and evaluation of his or her problem-solving abilities or style and thus provides a global appraisal of that individual as a problem solver" (p. 1). It is possible

the global appraisal that Heppner and colleagues (2004) discuss may not exist for members of particular cultural groups that favor a more collectivistic approach. Problem-solving appraisal for these groups may not be equivalent to the definition operationalized by the PSI measure.

Contextual Factors

Problem solving may be contextually based and difficult to assess with a quantitative measure alone. In their review, Heppner and colleagues (2004) discuss the possible utility of qualitative research in helping to better understand problem solving. What a person's ascribed role is and how that individual might function in one setting may be different from how they might function in another setting. Thus, an individual's style of problem solving may change based on the situation.

One contextual factor identified by Heppner et al. (2004) relates to problem-solving appraisal and coping. It would be important to understand how racial issues unfold in problem-solving appraisal and coping activities. The authors allude to a possible relationship between race and problem-solving appraisal when examining and developing more complex models of human adjustment. They make specific reference to the pervasive environmental demand of racism and note that problem-solving appraisal could be applied to dealing with such contextual demands. We support the authors' recommendation that such research might also address the point at which it is adaptive to recognize the limits of one's problem-solving appraisal (e.g., individual vs. collective problem solving). An example would be an African American man who faces continuous, systemic racism in his workplace and who may perceive his ability to problem solve as low and see himself as having no control in this situation. Because of race relations in the United States, his assessment may be accurate, and his low appraisal in itself might be a coping mechanism.

Another example of a potential contextual factor would be one's religious upbringing. The PSI research does not address religion and spirituality, and it is unclear how individuals from a community emphasizing a fate-based worldview would score on the PSI. It would be of interest to study whether religious orientation would influence one's problem-solving appraisal. For example, if someone has a fate orientation and believes that God has a plan, this individual may "defer" problem solving to God and may not have positive perceptions of his or her problem-solving ability.

Gender

It is important to note that the concerns with respect to diversity (i.e., individualism vs. collectivism, interdependence, context, etc.) may also apply to problem-solving appraisal and gender differences. Many researchers would say that while men may have an autonomous self, women's ways of being and relating are more interconnected (Gilligan, 1982; Jordan, Kaplan, Miller, Stiver, & Surrey, 1991). These gender differences may then affect how one perceives problem-solving appraisal. Heppner and colleagues (2004) reviewed the gender-related personality variables of instrumentality (agency, self-efficacy, and assertiveness) and expressiveness (nurturing, caring, and understanding others) as defined by Spence (1991). Problem solving was associated with instrumentality in all five of the studies. For expressiveness, the findings were mixed. Based on these initial findings, further study of gender issues is indicated. In addition, the racial and ethnic demographics for these gender studies were not reported. Heppner and colleagues did not address the potential interaction between gender and race/ethnicity with respect to problem-solving appraisal.

CONCLUSION

We commend the authors of this Major Contribution for creating such an extensive review of research on the PSI for the past 2 decades. The literature suggests that it is a valuable tool and that performance on the PSI can be related to diagnosis, treatment, and service delivery to address a variety of psychological problems. In understanding how to best use the measure, it would be helpful to conduct a meta-analysis that systematically summarizes findings obtained across studies. Furthermore, to better understand the effectiveness of the PSI, researchers must make efforts to conduct studies with populations beyond those of convenience (i.e., college students). Concerted efforts must also be made to include research participants from diverse racial and ethnic backgrounds. Examining performance on the PSI in relation to racial and ethnic identity, to cultures that emphasize collectivistic and interdependent norms of behavior, and to various environmental and contextual factors appears to be a promising direction for future research.

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