Kindai Management Review Vol. 4, 2016 (ISSN: 2186-6961)

Improved Reliability and Research Applications of the Basadur Creative Problem Solving Profile (CPSP)

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Abstract

The Creative Problem Solving Profile (CPSP) is an instrument designed to measure an individual's preferred cognitive style for thinking & problem solving in terms of two bipolar dimensions: the apprehension of knowledge and utilization of knowledge. These two dimensions are related to a staged process of applied creativity, and preferred cognitive state differences in each stage. We review and expand the theory underlying the CPSP and report a program of significant continuous improvement of the psychometric properties of the CPSP since it was first introduced. We provide evidence that the current instrument enjoys excellent internal consistency and test-retest reliability. Finally, we suggest avenues for future research and practical application building upon the concept of cognitive problem solving style in the fields of collaborative innovation, diversity and group conflict using the CPSP, an instrument that directly maps individuals' cognitive problem solving style onto the Creative Problem Solving Process.

Keywords: *innovation, creativity, problem-solving, style, collaboration, cognitive, knowledge, thinking, process*

INTRODUCTION

The Basadur Creative Problem Solving Profile (CPSP) was first introduced in the literature by Basadur, Graen and Wakabayashi (1990). The main purpose of the CPSP is to help people understand their creative problem solving style (personal preferences for different stages of a multi-stage process of creative problem solving) and to increase their sensitivity to individual differences in style. The CPSP has been used in organizational settings to help individuals understand their fit to the prevail-

ing organizational culture and to the cognitive demands of their jobs, and to help groups to improve the quantity and quality of their interactions and improve their problem solving performance (see e.g., Basadur, 1995, Basadur & Gelade, 2005, Basadur & Head, 2001). It is also being used in academic settings to teach the principles of innovative thinking (Goldsby & Basadur, 2016, in press; Goldsby, Basadur and Recker, 2007).

Basadur et al. (1990) reported encouraging preliminary reliability and validity test results and recommended continuing research to improve the reliability and validity of the instrument. Specifically, they suggested replacing items in the inventory to increase internal consistency reliability and conducting test-retest reliability testing on additional samples. The present paper focuses on the reliability recommendations, and documents a program of continuous improvement of the instrument that has significantly increased its reliability, and to summarize and propose research into practical applications of the instrument.

CPSP INSTRUMENT

Attempts to categorize the study of creativity frequently emphasize four kinds of research (Murdock and Puccio, 1993): First, understanding and assessing the *product* of creative efforts, (e.g. O'Quin and Besemer, 1989). Second, developing cognitive and personality tests to *identify* more or less creative people (e.g. Torrance, 1974). Third, *evironmental* or *organizational factors* affecting creative work (e.g. Amabile and Gryskiewicz, 1989). Fourth, understanding and modelling creativity as a *process* (e.g. Osborn, 1953; Basadur, Graen and Green, 1982). Our paper focuses on this fourth approach. Most researchers who have considered creativity as a process recognize that creativity requires more than the generation of a variety of ideas in response to a cue, and often does not begin with or depend on "given information." Guilford (1950) stressed the importance of "sensitivity to problems" in creativity and related it to our everyday notion of curiosity. Others have emphasized that *discovering and defining* new important problems to solve ("problem finding") and *implementing* new solutions ("solution implementation") are equally as, or even more important than, creating new solutions ("problem *solving*") (Ackoff, 1979; Getzels, 1975; Levitt, 1963; Leavitt, 1975; Livingston, 1971; Mackworth, 1965; Simon, 1960). Basadur et al 1982) provided empirical evidence that attitudes, behaviors and skills associated with problem finding were distinctly different from those associated with problem solving and that such attitudes, behaviors and skills can successfully be learned in appropriate training. Kabanoff and Rossiter (1994) cited problem finding as one of the most vital and difficult frontiers for creativity researchers — a "messy" concept that is hard to define and operationalize yet is a crucial element of creativity, especially real-world creativity in applied settings. Basadur, Ellspermann and Evans (1994) identified two separate components of problem finding activity. The first component is problem generation, which involves discovering new problems for subsequent definition. This is similar to what Simon (1977) called "opportunistic surveillance." The second component involves formulating a previously discovered but undefined problem. This second component is called problem formulation (or conceptualization, or definition). Edwin Land (1972) attributed his invention of the Polaroid camera to his unexpected finding of the problem (how to obtain instantaneous pictures), not its subsequent solution. Albert Einstein is reputed to have said that given an hour to solve a problem to save the world, he would devote 55 minutes to defining the problem, and only 5 minutes to solving it.

As for the importance of solution implementation, one needs only to remember Edison's famous quotation: "genius is 1% inspiration and 99% perspiration." Similarly, Osborn (1953) once said, "a fair idea put into practice is better than a good idea left on the polishing wheel." The world is full of people who have great ideas but are unable to take them through to completion. How can an artist claim to have been creative without having drawn the picture? Indeed, a new industry has recently emerged made up of small consulting companies who specialize in helping larger organizations put ideas into practice and move projects through to completion because these organizations simply are not up to the task. Evaluating ideas accurately, planning for implementation, and overcoming re-

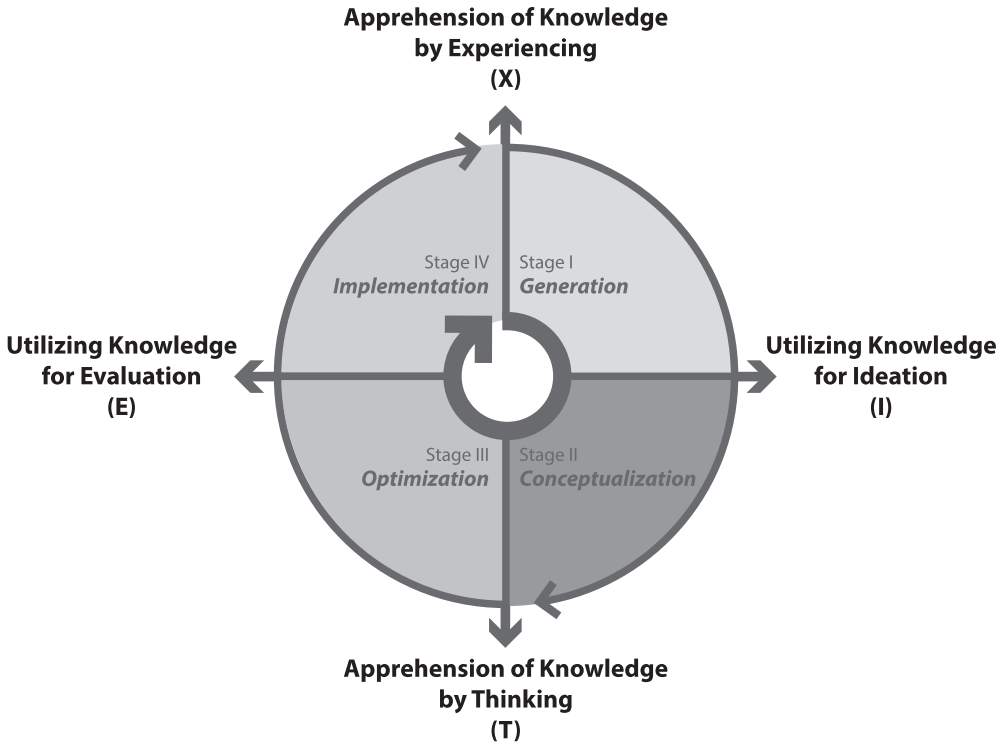


Figure 1: The Applied Creativity Process

sistance to change and procrastination are identified as important parts of creative thinking by many, including Leavitt (1975) and Basadur et al (1982).

These viewpoints contrast sharply with research that confines creative thinking merely to generating ideas to presented problems using techniques such as "brainstorming." Such research has dominated the literature from the 1950s (see review by Basadur, 1994). Practitioners who employ such limited conceptions of creative thinking seldom attain practical results (Sternberg, O'Hara & Lubart, 1997). More recent literature emphasizes more complete conceptions of creativity as process (Kabanoff & Rossiter, 1994; Rickards, 1994). Such complete models include not only multiple stages (beyond simply solving presented problems) but other important individual, group and organizational variables affecting creative performance such as motivation, cohesiveness, environment, linkage to goals, and specific skills, behaviors and attitudes. We choose to call these more complete approaches as process models of *Applied Creativity*. Kabanoff and Rossiter (1994) reviewed the growth of cognitive models of multi-stage creative thinking and problem solving processes and defined applied creativity as a *process* occurring in a real world, industrial, organizational or social context; pertaining to the finding or solving of complex problems; and having an actual behavioral creative product or plan as the final result. The CPSP instrument models such a process in terms of four distinct sequential stages of creative problem solving called Generation, Conceptualization, Optimization and Implementation (see Figure 1).

These four stages involve different types of cognitive activity, which can themselves be defined in terms of two orthogonal dimensions. One dimension, plotted on the vertical axis of Figure 1, represents the *Apprehension* of knowledge, and the other, plotted on the horizontal axis, represents the *Utilization* of knowledge. Both dimensions are bipolar, giving rise to the four successive stages of the creative process.

The two poles of Apprehension are: direct, concrete *experiencing*, denoted X, and detached, ab-

stract *thinking*, denoted T. The distinction between these two types of knowledge acquisition has a long history, going back at least as far as Kant (1798/1978), who distinguished between sensory and intellectual cognition, and was recognized by Thorndike, 1931 (learning by trial and error vs. learning by ideas) as well as later authors (e.g. Mintzberg, 1989; Wonder and Blake, 1992). Guilford (1967) differentiated the mental operation of cognition (gaining knowledge by experiencing) from the mental operation of convergent production (converting given information into the "correct" answer; this is what Sternberg (1996) defined as theoretical, analytical intelligence). Kolb (1976), identified learning by concrete experience and active experimentation as distinctly different from learning by reflective observation and abstract conceptualizing.

The two poles of Utilization are: using knowledge to create or entertain various possibilities, points of view and options (ideation), denoted I, and using knowledge to judge and select (evaluation), denoted E. We conceive these poles as corresponding respectively to Guilford's (1967) divergent production and evaluation. All individuals are able to utilize their knowledge in both ways, but tend to prefer one or the other.

We next describe how the dimensions of knowledge Apprehension and knowledge Utilization relate to the four hypothesized stages of the applied creativity (creative) process. (For a more detailed description see Basadur and Gelade, 2005). In brief, the first two stages of Figure 1 represent the two components of problem finding: generation and conceptualization. The third and fourth stages of Figure 1 represent problem solving (optimization) and solution implementation (implementation) as the final two stages of the creative process. Following is a description of each of the stages (Basadur, 1995).

The Quadrant I stage is called *Generation* and involves Apprehension by Experience and Utilization for Ideation. Here, physical contact with, and involvement in, real world activities (X) alerts the individual to inconsistencies and difficulties. This knowledge is then used to suggest new problem areas, to identify opportunities for improvement, and to propose projects that might be worth undertaking (I). At this stage, problems and opportunities are recognized, but are not yet clearly articulated or understood.

The Quadrant II stage is called *Conceptualization* and involves Apprehension by Thinking and Utilization for Ideation. Here, a proposal, problem, or opportunity identified in the previous stage is systematically thought through (T) to create a sound conceptualization or model of the problem domain. Here, understanding of the problem area is gained not by direct experience but by abstract analysis. This conceptual knowledge is then used as the basis for ideation whereby one or more plausible solutions are developed (I).

The Quadrant III stage is called *Optimization*, and involves Apprehension by Thinking and Utilization for Evaluation. In this stage the conceptualizations of stage II are critiqued (T) against real world constraints in order to identify practical difficulties. Alternatives are systematically examined in order to select (E) an optimal plan for implementing the solution that can be executed with existing resources.

The Quadrant IV stage, *Implementation*, completes the creative process, and involves Apprehension by Experiencing and Utilization for Evaluation. Creative activity in this stage consists of experimenting with the new solution (X), evaluating the outcomes (E), and making adjustments if necessary to successfully implement them.

Stages I to IV in Organizations

Individuals in organizations have varying preferences for each of the stages in the creative process because they have varying preferences for the bipolar modes of apprehension and utilization. Generating ideas for new products, services, and methods must start somewhere. Individuals inclined toward generating are continually experiencing and scanning the environment, picking up data and cues from customers, suppliers, and others, and suggesting possible opportunities for change and improvement. Thus, the generation stage is where new information and possibilities are raised—usually not fully developed but in the form of starting points for new projects. People with dominant conceptualizer styles lead in compiling facts and idea fragments from the generator stage into well-defined, insightful problems and chal-

lenges and more clearly developed ideas and projects worth further evaluation. Skilled conceptualizers give sound structure to fledgling ideas and opportunities. People inclined toward optimization usually lead in taking these well-defined ideas and finding a practical best solution and detailing efficient plans for proceeding. Finally, implementers lead in carrying forward the practical solutions and plans, including convincing colleagues or customers of the worth of the changes, and adapting the solutions and plans to make them fit real-life situations and conditions.

How the CPSP Inventory Works

The CPSP consists of two lists of 12 word pairs. In one list, the 12 pairs of words are descriptive of Apprehension, one member of each pair representing Apprehension by Experiencing (X), and the other representing Apprehension by Thinking (T). In the second list of word pairs, the 12 word pairs are descriptive of Utilization, one word in each pair representing Utilization for Ideation (I) and the other representing Utilization for Evaluation (E). Each word pair from the Apprehension list is combined with a word pair from the Utilization list. This produces 12 four-item sets of words, each set containing one word representing X, I, T and E. In addition, six four-word distractor sets are embedded within the 12 four-item sets of words. These distractors contain unrelated words and are intended to prevent respondents from identifying patterns and responding stereotypically.

Respondents are instructed to rank the words within each four-item set from 1 to 4, where 1 represents the word "least characteristic of me as a problem solver" and 4 represents the word "most characteristic of me as a problem-solver." Upon scoring the instrument, the respondents are able to plot their totals for each of the four columns and show their relative preferences for each stage.

The measures of Apprehension and Utilization are constructed from the scores on each set of word pairs. One variable (XT) is constructed by subtracting the T-item score in a word set from the X-item score in the same set, and the other (IE) by subtracting the E-item score from the I-item score. The 12 XT scores constitute a bipolar scale of Apprehension, which represents the preference for experiencing over thinking; the 12 IE scores constitute a bipolar scale of Utilization representing the preference for ideation over evaluation. For each four-item word set, XT and IE can take values of ±3, ±2, or ±1. An individual's Apprehension and Utilization scores are respectively the sum of his or her 12 XT and 12 IE scores. The theoretical range for both scales is -36 to +36, with an expected mean of zero.

The psychometric properties of the CPSP which we report below are based on the Apprehension and Utilization scales. It should be noted that these scales are statistically independent (to see this, note under conditions of random responding that the expected value of IE is zero for all values of XT and vice versa) and therefore can be analyzed by standard statistical methods.

Improving the CPSP Inventory

Since the CPSP was first introduced, an ongoing program of item replacement to improve its psychometric properties has been under way. A total of 6,091 CPSP inventories were collated (CPSP version 1, n = 1,536; CPSP version 2, n = 2,122; CPSP version 3, n = 441; CPSP version 4, n = 883; CPSP version 5, n = 1,109). Respondents were attendees at in-company and public training courses in creative thinking and problem solving (the vast majority in full-time employment), or MBA or business students who completed the CPSP as an element of course-work.

The strategy was to try to increase the internal consistency of the Apprehension and Utilization scales and expect that corresponding improvements to the four columns and quadrants will follow. Item pairs which were weakly correlated with the rest of the item pairs in the same scale were replaced by item pairs that were predicted to be more highly correlated, and the new scale was tested to evaluate the predictions, and Cronbach alpha was recalculated. The effect of the modifications on the independence of the bipolar scales was also monitored. (The details of the methodology and iterative results have been documented in several working papers and are available from the senior author. For example, intra-correlation matrices for the two bipolar scales were examined, and scale items showing negative or low correlations with the rest of the

Table 1: Psychometric Properties of Successive Versions of the CPSP

CPSP Version	1	2	3	4	5
Number of Respondents	1,536	2,122	394	830	692
Kendall's *W*	.16	.21	.22	.33	.32
Reliability[a]					
Apprehension (XT)	.614	.727	.776	.800	.800
Utilization (IE)	.683	.776	.776	.811	.803
Mean inter-item correlation					
Apprehension (XT)	.12	.18	.22	.25	.25
Utilization (IE)	.15	.22	.22	.26	.25
Correlation between XT and IE	.11	-.30	-.27	-.25	-.20
FACTOR ANALYSIS					
% Variance explained					
Factor 1	14.9	17.1	17.5	18.0	17.4
Factor 2	11.2	12.5	14.4	15.8	16.1
First six eigenvalues	3.77	4.62	4.76	5.00	4.78
	2.51	2.49	2.90	3.13	3.26
	1.39	1.47	1.40	1.30	1.20
	1.30	1.10	1.16	1.09	1.10
	1.07	1.05	1.08	1.05	.98
	1.01	1.00	1.00	.96	.96

[a] Cronbach standardized item alpha

scale items were replaced with experimental new items and tests were conducted to confirm that improved correlations resulted).

In this way, four progressively improved versions of the CPSP (termed CPSP 2, 3, 4 and 5) were developed. The psychometric properties of each version are described and evaluated in the following section.

In addition to values of Cronbach Alpha, we report here Kendall's (1955) coefficient of concordance (*W*) for each version. This statistic is especially appropriate to evaluate the consistency of forced-choice scores. *W* is usually applied to the case of *k* judges ranking *N* separate targets, and ranges between zero and one. Increasing values of *W* indicate increasing degrees of consistency among the judges. Here, we may regard each set of four words in the inventory as an independent judgment, and calculate the consistency of judgment (*W*) across the 12 sets of non-distractor words. (i.e., $N = 4$, $k = 12$.) Kendall's *W* was calculated for each respondent following the method described in Seigel and Castellan (1988, p. 263) and the average *W* over all respondents was calculated for each version of the CPSP.

As predicted the successive iterations significantly improved the internal consistency characteristics and test retest reliabilities. Table 1 shows the results for successive versions of the CPSP.

The increases in *W* with successive versions of the CPSP indicate that modifications to the instrument produced a general improvement in the consistency of ranking assignments, leveling off at CPSP 4.

For both the XT and the IE scales, successive modifications lead to a general improvement in the mean inter item correlation and standardized item alpha that levels off at CPSP 4. The change from CPSP 1 to CPSP 2 leads to an increased correlation between the scales, which then decreases with successive modifications.

Factor analysis of the Apprehension and Utilization scores (Principal Components extraction with Varimax rotation) was conducted for each

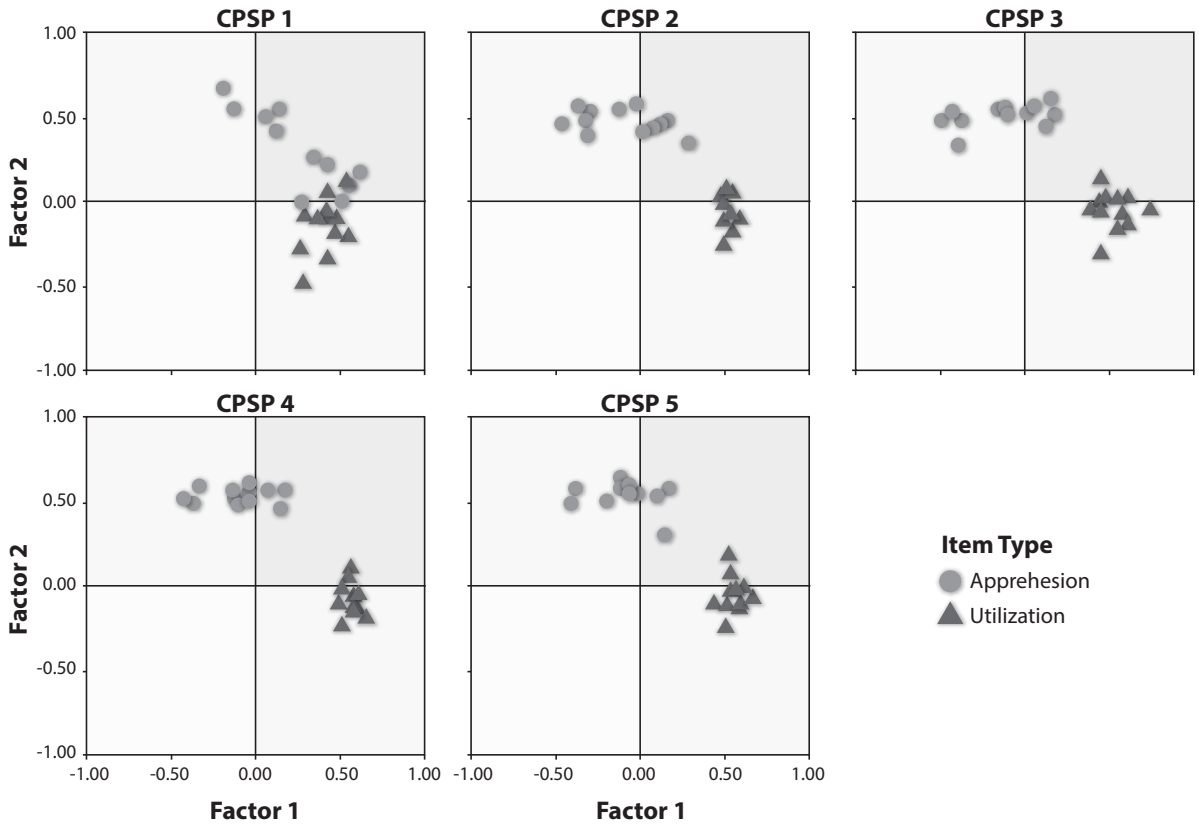


Figure 2: Factor Loading Plots for Successive Versions of the CPSP

version of the instrument. The Velicer Map test for factor extraction quantity (Velicer, 1976) indicated a two-factor structure in each case, as did a Scree plot of the eigenvalues (Cattell, 1966). As shown in Table 1, in successive versions of the inventory, the first two factors explain successively higher percentages of variance, leveling off at CPSP 4. Furthermore, inspection of the factor loading matrices showed that successive modifications of the questionnaire generally decreased the loadings of items on to non keyed factors. The factor loading plots in Figure 2 illustrate this effect: the association between the items and their keyed factors is visibly stronger in CPSP 2 and subsequent versions than in CPSP 1.

Table 2: Test-Retest Correlations

CPSP version	1	2	3	4	5
n	169	124	12	32	80
XT	.67	.85	.79	.75	.78
IE	.69	.82	.85	.91	.79

Note: All correlation coefficients are statistically significant at the p<.001 level.

Overall, these results demonstrate satisfactory psychometric properties in terms of consistency, scale reliability and scale discrimination in the most recent CPSP versions and substantial improvements in the subsequent versions of the CPSP.

Table 2 displays the test-retest correlations for the XT and IE scales for the CPSP 1, CPSP 2, 3, 4 and 5. Tests were administered one week apart. These correlations represent satisfactory test-retest reliability for CPSP 2, 3, 4, and CPSP 5, and substantial improvements over CPSP 1. We have chosen to adopt CPSP 5 over CPSP 4 because of its lower correlation between the two bipolar scales.

Overall, these results demonstrate significant improvements in psychometric properties in terms of consistency, scale reliability, scale discrimination

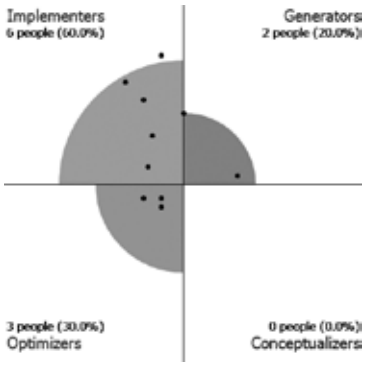
and test-retest reliability in the successive iterations of the CPSP. The most recent version, CPSP 5, appears to be a robust instrument with many opportunities for application in further research.

APPLICATIONS AND FUTURE RESEARCH OPPORTUNITIES

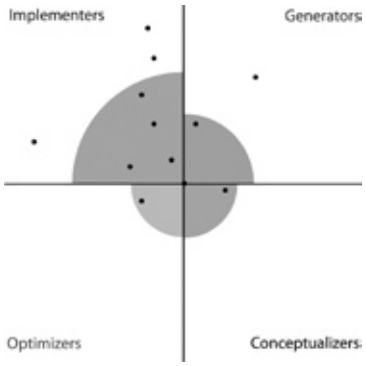
A feature of the CPSP is that it not only measures different problem solving styles but it maps and interconnects with directly onto a creative problem solving **process** that flows through the four different stages. Thus we believe that the CPSP has substantial opportunities as a hands-on tool for individuals and organizations especially with respect to team and interdisciplinary team performance, collaborative innovation, and the management of change, innovation, and human resources. Understanding one's own cognitive creative problem solving style can help individuals adapt to their organizations and increase self-efficacy in several ways. For example, individuals can better assess their cognitive fit with the prevailing cognitive culture of the organization as a whole or with their particular department or function and with the cognitive demands of their job, better manage their personal development and career progression, and develop skills in working with others. For example, if the prevailing culture favors and rewards implementation proficiency, a person whose style preference is different from implementation can adapt accordingly, by learning to cope, finding ways to increase their value by complementing the work of others in their department, seeking a reassignment to another department whose work or culture may be more congruent with their style, or even leaving the organization. We suggest that hiring practices should incorporate understanding of individual problem solving styles to ensure good decisions are made with respect to cognitive fit with the job or department under consideration. Human Resources professionals can better aid individuals in managing their careers by helping them understand their styles. This can help individuals find better job fits for themselves, develop the necessary cognitive skills for upward mobility and make better decisions whether to accept promotions or transfers. We therefore suggest the following sample research proposition for future study:

> ***Proposition 1***: Individuals whose CPSP style preferences are more congruent with the cognitive demands of their job, department or organization will experience a higher level of job satisfaction than those who have lower levels of such congruency.
>
> Three qualitative examples are shared below illustrating this hypothesis via scatter diagrams showing Creative Problem Solving Styles for self selected: i) Firefighters, ii) Air Traffic Controllers and iii) Strategic Foresight and Innovation Students in a Masters program. Firefighter and Air Traffic Control roles are strongly biased towards Quadrant IV Implementation behavior for problem solving. Students on Strategic Foresight and Innovation have a bias towards Quadrant I (*Generation*) and Quadrant II (*Conceptualization*). In simple terms Firefighters need to "put out the fire" and Air Traffic Controllers need to "land the plane" in the real world while Strategic Foresight/Innovation students are more interested in envisioning the future.

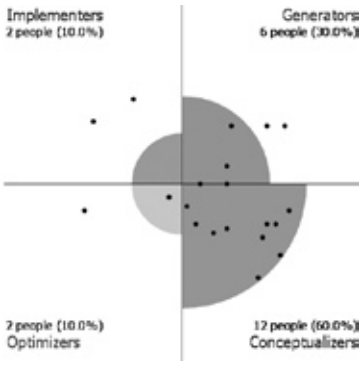
The CPSP also provides special opportunities for increasing understanding and insights into group diversity, group conflict, and group problem solving and collaboration for innovation. A relatively unexplored aspect of group diversity is group *cognitive* diversity. There have been many studies focusing on knowledge diversity, personality diversity, and functional and educational diversity as so-called deep level constructs which go beyond the traditional study of race, ethnicity and other surface level diversity constructs (cf. Harrison et al., 2002; Ragins & Gonzalez, 2003). Recent research into group diversity and conflict has focused on creativity. For example, successfully managing conflict between group members is argued to enable groups to function more creatively (Jehn & Bendersky, 2003). Diversity, it is argued, is important to group creative performance as it means group members provide unique knowledge due to their differing backgrounds, whether this uniqueness stems from surface level or deep level characteristics (Milliken, 2003). We argue that much more research is needed to go beyond *knowledge* diversity



Fire Fighter Team Distribution



Air Traffic Controllers Distribution



Strategic Foresight and Innovation Masters Program Students Distribution

into problem solving *process* diversity. For example, might there be "optimal mixes" of the different CPSP styles for different kinds of problems to be solved? Might there be any moderating effects on such mixes by individuals' personality traits? To what extent might the quality of hiring or transfer decisions be improved to increase the effectiveness of a mix of people, say in a department, a team, or even a senior management team? Examples of diagnosing organizational performance problems due to sub-optimal mixes of CPSP styles are provided in Basadur and Gelade (2003). Furthermore, can individuals be trained to synchronize their styles with those of others during group creative problem solving regardless of their preferred style to increase efficiency?

The concept of group problem solving style diversity as modeled by the CPSP offers a hands-on tool for application to improving the benefits of group diversity and reducing the effects of dysfunctional group conflict. A crucial distinction of the CPSP is that it enables exploration of diversity and conflict from a problem solving perspective. Often overlooked in diversity and conflict research is the reality that the groups being studied are engaged in problem solving. Diversity is most useful in helping groups solve problems creatively (Mannix & Neale, 2005; Milliken et al., 2003). In groups, problem solving is often ineffective and members are in conflict because they don't know how to efficiently mesh their differing cognitive styles of problem solving. In terms of conflict management, Jehn (1997) identified a third kind of conflict (in addition to task and inter-personal conflict) which she labeled **process conflict**. Process conflict refers not to conflict about *what* is being talked about (task conflict) but how things should be *processed*. This means assigning work to whom and by when. We suggest the possibility of a deeper level of such process conflict which is called *problem solving style conflict*. This would be the frustration and inefficiency caused by the lack of synchronization of differing problem solving styles.

Interdisciplinary teamwork is also an important topic in the management literature especially in how it bridges to innovation, continuous improvement, employee engagement, and complex problem solving (e.g. Hauschildt, 2001). Often, interdisciplinary teamwork is especially frustrating and even dysfunctional because the different disciplines tend to favor different problem solving styles (Basadur and Gelade, 2003). Yet, if teams are not created with an appropriate mix of styles, their performance may suffer. Basadur and Head (2001) reported an experiment in which teams of MBA students with a mix of styles significantly out-performed teams whose members all had the same style in innovative work. In the former case, all cognitive problem solving stages of the creative process were readily available within the team, but in the latter case, certain stages of the process were under represented. We suggest that if team members understand their own creative problem solving styles and thus their personal preferences for different stages of a multi-stage process of creative problem solving, this can increase their sensitivity to, patience with, and ap-

preciation of the value of their team mates' different styles and improve the quality of their interactions and their team problem solving performance (see e.g., Basadur, 1995; Basadur & Gelade, 2005).

From the standpoint of managing organizational innovation and change, the CPSP may offer organization insights on how to increase effectiveness in the face of accelerating change, increased competition, and pressure for revenue growth. While many corporations recognize the need to innovate, they also find it difficult to do. There is an opportunity to use the four stage process as a blueprint for getting the organization to cycle through of all four stages as a consistent organization-wide business innovation process just as they have standardized other business processes. Perhaps organizational members can build skills in synchronizing their different preferences for the stages of the CPSP and more efficiently and collaboratively work with members from different parts of the organization through the complete applied creativity process to successful implementation of valuable changes. This would include individuals on teams learning to recognize their own preferred styles and to understand their styles as representing only a portion of a complete change process, and skillfully integrating their styles with their team mates to allow the four stage process to be implemented successfully and efficiently.

We suggest the following additional propositions as sample starting points into future research in these fields:

Proposition 2: Groups trained to understand and appreciate CPSP style differences will report reduced interpersonal and task related conflict than untrained groups.

Proposition 3: Groups trained to understand and appreciate CPSP style differences will more speedily and efficiently develop and implement higher quality innovation solutions.

Proposition 4: Groups that are set up to include cognitive problem solving style diversity will outperform groups that are not, and report higher group satisfaction with their results.

Proposition 5: Members of problem solving groups who are trained to understand the four styles of the problem solving process represented by the CPSP will value their group's diversity more than will members of untrained groups.

CONCLUSION

In the first part of this paper we have reviewed and expanded the theory underlying the CPSP and reported the results of a program of significant continuous improvement of the psychometric properties of the CPSP. We report that the current instrument now enjoys satisfactory internal consistency and test-retest reliability. Future publications will share further insight derived from a growing database of over 30,000 subjects that have implemented the profile successfully around the world, across industries and academia.

The second part of the paper highlights specific areas of research that would likely benefit from studies utilizing the CPSP including human resource management such as person-organization fit, organizational innovation performance, and team performance and collaboration. For example, published research in both the group diversity and group conflict fields of study argue that increased group creative performance is an outcome impacted by these constructs (Jehn & Bendersky, 2003; Milliken et al., 2003). We suggest, however, that much of the current research exploring the relationships between group diversity and group conflict with group creativity has failed to sufficiently emphasize the importance of the fact that the groups being studied are really engaged in creative problem solving activity. Doing so would enable researchers to more accurately frame their studies in a more accurate work context, and examining the cognitive problem solving styles of the individual group members may well offer valuable insights into the dynamics of group diversity and group conflict beyond that which has been revealed thus far in the respective literatures. Based on this discussion, we have offered propositions for future research building through the application of the CPSP in the fields described above. We would welcome additional ideas and questions from readers. On a final note, for readers who may wish to explore further, the CPSP is easily accessed for immediate implementation at https://www.basadurprofile.

com/. We would welcome feedback on experienced benefits and insights to users who do give it a try and participate in helping build the body of knowledge via expanding the database of cohorts for ongoing research.

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