

Positive Psychological Capital Development: A Field Study by the Solomon Four Group Design

Öznur Gülen Ertosun¹, Oya Erdil², Nevin Deniz³ & Lütfihak Alpkın⁴

¹ Vocational School of Social Sciences, Istanbul Medipol University, Istanbul, Turkey

² Faculty of Business Administration, Gebze Technical University, Kocaeli, Turkey

³ Faculty of Business Administration, Marmara University, Istanbul, Turkey

⁴ Faculty of Management, Istanbul Technical University, Istanbul, Turkey

Correspondence: Öznur Gülen Ertosun, Vocational School of Social Sciences, Istanbul Medipol University, Istanbul, 34810, Turkey. Tel: 90-021-6681-5100. E-mail: ogertosun@medipol.edu.tr

Received: July 26, 2015

Accepted: September 11, 2015

Online Published: September 25, 2015

doi:10.5539/ibr.v8n10p102

URL: <http://dx.doi.org/10.5539/ibr.v8n10p102>

Abstract

Positive psychological capital has taken attention in the last decades considering today's work conditions and employee expectations in gaining competitive advantage. There is growing evidence that positive psychological capital has contribution on employees' desired outcomes and provides a new perspective for understanding and potentially managing negative and stressful organizational circumstances. Recent theory and research have also proposed that positive psychological capital as a state-like construct is open to development and change. The immediate goal of the study is to design and implement a short positive psychological capital training program by following Luthans et al. (in their series of studies in 2006, 2008, & 2010) course of action and control its effectiveness by the Solomon four group experimental design which is one of the most powerful research designs available and rarely used especially for training programs. A sample of 156 management students participated to the training program. The findings of the current research will contribute to human resources development literature as well as to Solomon experimental design application.

Keywords: hope, optimism, positive psychological capital, resilience, self efficacy, solomon four group experimental design, training

1. Introduction

Psychology used to concentrate more on mental illness rather than wellness until the recently increased attention towards 'positive psychology'. The positive turn is also fundamental for occupational health psychology (Schaufeli, 2004). Traditional individual and organizational interventions focus on momentary damage (operational training etc.) in contrast the positive psychology concentrates on principles of prevention, improvement and development as a new perspective (Seligman & Csikszentmihalyi, 2000). Additionally studies on the subject of training and development rarely targeted at the workplace (exp. Gist, Stevens, & Bavetta, 1991; Holdnak, Clemons, & Bushardt, 1990) and generally focus on long term applications (Kossek, Roberts, Fisher, & Demarr, 1998; Fresco, Moore, Walt, & Craighead, 2009) rather than micro interventions such as 2-hour implementations.

As an addition to the already existing human capital and social capital constructs, Luthans, F., Luthans, B., & Luthans, K. (2004) composed a construct to measure sustained competitive advantage within an individual which is labeled as 'Positive Psychological Capital (psycap)'. It consists of four components: Hope, optimism, self-efficacy and resilience. Relying on 'Positive Organization Behavior' (POB) movement, it measures positive psychological aspects of an individual and focuses on the strengths rather than the weaknesses (Luthans et al., 2004). Stajkovic (2006) has advanced the same four constructs and called as 'core confidence'.

Similar to the traditional (financial, structural/physical, technological), human (explicit and tacit knowledge), and social (networks, norms/values, and trust) capital, positive psychological capital also contains some basic components of being positive, unique, measurable, developable, and performance-related (Luthans & Youssef, 2004). Avolio and Luthans (2006) conceptualized positive capacities 'as a state-like construct that is more stable than a mood or brief affection and less stable than intelligence and personality' (Avey 2007, p. 8). State-like

properties can be developed (e.g. trained) over time, as opposed to trait-like constructs, has been supported with a series of studies (Luthans et al., 2006, 2008, & 2010).

In the light of the related literature, the purpose of this study is to perform a positive psychological capital intervention and test its effectiveness with the Solomon design which is the most powerful experimental design. Firstly literature about psycap is reviewed and theoretical background for the development process and training procedures for the study is explained. Then, methods for Solomon design are discussed and hypotheses are developed. The study proceeds with findings and conclusion sections.

2. Literature Review and Hypotheses Development

2.1 Positive Psychological Capital Development

Luthans et al. defined positive psychological capital as “an individual’s positive psychological state of development that is characterized by: (1) Having confidence (self efficacy) to take on and put in the necessary effort to succeed at challenging tasks; (2) Making a positive attribution (optimism) about succeeding now and in the future; (3) Persevering toward goals and, when necessary, redirecting paths to goals (hope) in order to succeed; and (4) When beset by problems and adversity, sustaining and bouncing back and even beyond (resilience) to attain success” (Luthans, Youssef, & Avolio, 2007b, p. 3).

Hope is considered as positive motivational state that is based on an interactively derived sense of successful agency and pathways (Snyder, 2000). Pathway refers to the method, strategy or ability to achieve goals and willpower (agency) means the motivation or beliefs to pursue goals and is the psychological energy of achieving objectives (Zhao & Hou, 2009). In the light of Snyder’s hope theory Luthans et al. suggested goal design-pathway generation- overcoming obstacles implementations in order to increase hope capacity (Luthans, Avey, Avolio, Norman, & Combs, 2006).

As a short description, optimists expect good things happen to them (Carver & Scheier, 2002) and explain positive events as internal (something about themselves), stable (persists or recurs over time) and global (effects many situations) and also vice versa for negative events (Peterson et al., 1982; Oettingen, 1995). In Seligman’s attribution framework this approach labeled as optimistic explanatory style (Nelson & Cooper, 2007). As a result, optimism can be considered a global positive expectation of success; Self efficacy is task or domain specific and the employee’s confidence to his/ her abilities that is a specific positive expectation (Stajkovic & Luthans, 1998). According to Bandura (1997) self efficacy mobilizes the motivation and cognitive resources in order to take the necessary actions to complete the specific task (Qingshan & Xuansheng, 2014). And also he defines four mechanisms in order to improve self efficacy. These include task mastery, modeling (vicarious learning), social persuasion (positive feedback), and physiological/psychological arousal (Luthans et al., 2006). In this training program three of the four mechanisms (expect for psychological arousal) is used for self efficacy exercises.

Resilience is defined as “a class of phenomena characterized by good outcomes in spite of serious threats to adaptation or development” (Masten, 2001, p. 228). Resilience development process contains asset factors that increases individual and environmental benefits- and vice versa for risk factors and also contains influence process for both of them (Masten, 2001). Resilient people restrainedly accept facing with harsh realities. They attribute a meaning to terrible times. And they have an ability to adapt the conditions and content with what they have (Coutu, 2002).

Luthans et al. recently developed a short training version (psycap intervention-PCI) and published a series of empirical studies (2006, 2008, 2010, & 2012). Luthans et al. (2006) firstly initiated their training program to management students as experiment and control groups (the control group received decision making training), then to managers from different companies and sectors and then to a single firm. All findings indicate that PCI has developed the participants’ psycap levels. Following PCI study of Luthans et al. (Luthans, Avey, & Patera, 2008) tested web-based training intervention and significant support has been found. Additionally in another study (Luthans, Avey, Avolio, & Peterson, 2010) in control group concentrate on ordering (that is developing mechanism of the capacities given in different orders to the participants) and found no significant difference. And for main study they tested PCI training’s effect on their performance level. Participant and their managers rated their performance level and found that PCI increases their performance level in addition to their psycap. Using a pretest, posttest control group design, psycap has also been shown to be significantly related to business student academic performance (Luthans, Luthans, & Jensen, 2012).

2.2 Training Procedures for Positive Psychological Capital

Following Luthans et al. guide and related literature a psycap development training program has been developed in this study. Theory building and development process about positive capacities is based on the work of

Masten's (2001) for resilience component, Snyder's (2000) hope, Bandura's (1997) self-efficacy theories and also expectancy-value orientation and realistic optimism. Based on the theories suggested developmental mechanisms are used to develop the capacities.

The training program begins with the introduction of positive capacities; how each capacity is applicable in the workplace. Positive emotions and positive psychological capital are defined. Additionally each capacities (hope-optimism-resilience-self efficacy) are explained in detail and also examples are given.

Then participants are asked to think about and write down their realistically challenging and personally valuable goals. The training program contains the discussion and examples of what are realistically challenging goals and how to determine if the goal is personally valuable (develop willpower capacity) then goals are divided to sub-goals (stepping) so their agency capacity increased. Achievable perception about sub-goals also increased their will power capacity. Accomplishment expectation increases both hope and also optimism capacities. Furthermore, participants are asked how they could achieve their goals and other participants encouraged to give suggestions. For a short time participants are asked to think about the obstacles. And then others contribute their ideas for each other. Trainer encourages them to define the obstacles and develop multiple pathways. Alternative solutions, risk plans for potential obstacles also develop their hope capacity.

Goal exercise is also effective for the 'self efficacy building' by the mediation of task mastery and social persuasion (etc. participants share their goals, determine pathways and advice to each other, and trainer encourage the interaction process). Besides in the training program some famous films, successful examples from political leaders and business world are examined in terms of their pscap capacity (modeling). Luthans implies that self efficacy and hope development exercises also increases the optimism level of participants. For example in the training section trainer frequently encourages participants to positive self talks. Moreover in this phase positive output definition and imagination of achieving goals increase positive expectancy and optimism.

Training continues for resilience development processes. Resilience development concentrates on participants' perception about emotional, cognitive and behavioral process. Self reflection exercises (from past to future) help to run personal SWOT analysis. Participants consider and express negative workplace experiences and share their reactions with others. Then trainer talks about ideal resilience process (such as realistic perception about the negative events and ideal reactions). "Impact-control-options" are examined for developing the right reactions. In control and out control situations are explained and examined in order to contribute learning process about problem solving and conflict management styles. This process developed both cognitive resiliency and realistic optimism. The development process ends up with the useful exercises to adapt the gains routine working days.

As explained above, most of development mechanisms help to improve more than one construct and this confirms that all four components (hope-optimism-resilience-self efficacy) reciprocally interact with each other and pscap means more than all of them.

2.3 Theoretical Framework for Solomon four Group Design

While one group design involves a pre-test/post-test without using a control group, two group designs use an experimental (training) and control group (without training) and two groups take a pre-test/post-test. About one hundred years ago control groups took place in behavioral sciences because it had been observed that pre-testing or assessment itself had effects on change over time to intervention and that assessment may interact with interventions to either strengthen or weaken observed effects. In these circumstances 2-group comparisons in trials may produce biased estimates of effects however advent of randomization to allocate participants to groups subsequently that is reactivity can't be solved by pre-testing in the two-group trial, Solomon thus proposed a 4-group (and in some cases a three group) "extension of control group design" in which a further randomization took place, allocating participants within both the experimental and control groups to be pre-tested or no (Solomon, 1949; McCambridge, Butor-Bhavsar, Witton, & Elbourne, 2011).

An experimental group receives a pre-test, training and then post-test, a control group receives a pre-test and a post-test separately another experimental group receives training and only a post-test, last control group only takes a post-test. Albeit the Solomon four group design contains two experimental and two control groups, it is illustrated in the following Table (1). According to Solomon, this modification of the currently used control group design has potentialities for demonstrating and weighting certain interaction effects (Solomon, 1949). As Babbie (2013) mentioned in his book, Solomon design not only eliminates the interactions between testing and the treatment, it also provides data for comparisons that will reveal the amount of such interaction that occurs in classical designs.

Campbell and Stanley (1966) suggested three basic patterns of true experimental research designs:

Pretest-posttest control group design, posttest-only control group design and Solomon four group design (also cited in Salkind 2010). Despite the advantages in strengthening both internal and external validity of research (Newman & Newman, 1994), the Solomon-four group design is seldom used especially in social sciences (Spector, 1981) because of the four group requirements and statistical difficulties (McCambridge et al., 2011).

Table 1. Solomon four group design

Group	Pre-Test	Training	Post-Test
E ₁	T ₁ (Q1)	X	T ₂ (Q2)
C ₁	T ₁ (Q3)		T ₂ (Q4)
E ₂		X	T ₂ (Q5)
C ₂			T ₂ (Q6)

Note. E: experimental group; C: control group; X: treatment condition.

T: testing condition, 1 = pre-test, 2 = post-test; Groups are labeled as Q1...Q6 for analyses.

Adapted from Gibson, et al. 1988.

While Solomon's suggestions about statistical analysis of his experimental design have been criticized by other researchers, Campbell & Stanley (1963) suggested exploring statistical solution for the Solomon four-group design by use of 2 X 2 analysis of variance design. Newman and Newman (1994), Breakwell (2004) and also Glinger and Morgan (2000) accepted the design as a factorial design and supported the idea. However, Spector (1981) addresses that there would be missing data for half of the subjects in Anova designs. His suggestion was to conduct the analysis in stages. Additionally, Braver, and Braver (1988) proposed using meta-analysis also Sawilowsky and Markman (1988) and Sawilowsky, Kelley, Blair, and Markman (1994) supported this idea with their comments and contributions. According to the researchers meta-analysis demonstrated superior power of using meta-analytic techniques instead of customary analysis of using ANOVA (McGhee, 2009).

Faigenbaum and Costello (1975) used student t test for Solomon design. Holdnak et al. (1990) used 2 X 2 Anova for testing self-esteem training effectiveness. Cinco (1981) investigated the effects of group counseling on the personality and behavior of children with behavior problems. Firstly she performed 14 two-way ANOVA's and for other dependent variable (ordinal data) she used Wilcoxon Matched Pairs Signed-Ranks Test (cited in Sevilla, Ochave, Punsalan, Regala, & Uriarte, 1992). Randolph and Myers (2013) discussed using independent samples t test which causes labor intensive and increased risk of making a Type 1 error and suggested Anova tests for Solomon analyzing. Cortese (2007) also offers paired samples t test and Anova tests for Solomon's four group design. Similarly McGahee (1998) and McGahee and Tingen (2000) utilized several different types of analysis concerning a series of hypothesis and also for comparison of Solomon groups Babbie's suggestion is followed by paired samples t test. There exists disagreement amongst scholars about statistical method for Solomon design. Recent studies have different suggestions. It is also stressed in studies that the hypotheses and the data types are also important for the statistical method selection. In this study paired samples t test is found suiTable for the data type and hypotheses of the study.

2.4 Research Model and Hypotheses Development

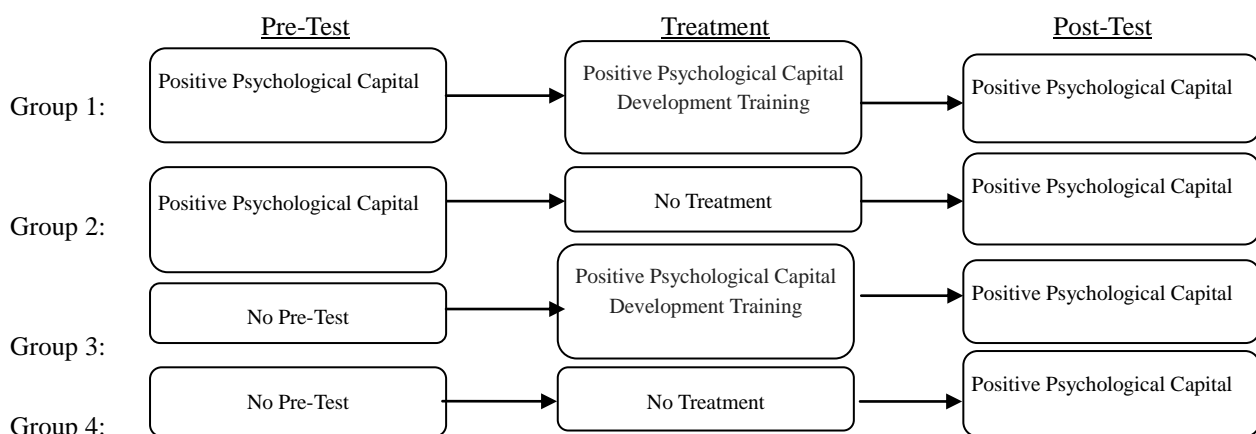


Figure 1. Research model

The main hypothesis based on the above mentioned literature and research model of the study are given in the following manner:

H₁: Positive psychological capital development training increases positive psychological capital capacities of participants.

According to Isaac and Michael (1981), factors that threaten internal validity are: History, maturation, pretest effects, instruments, statistical regression toward the mean, differential selection of participants, mortality, and interactions of factors and threats to external validity include: Interaction effects of selection biases and treatment, reactive interaction effect of pretesting, reactive effect of experimental procedures, and multiple-treatment interference. The Solomon four-group design enables a researcher to control threats both internal and external validity by controlling maturation, history and pretesting. Post-test scores of the experimental and control groups are affected by several factors, Q2: Pretesting-maturation-treatment-history Q4: Pretesting-maturation-history, Q5: Treatment-maturation-history and Q6: maturation-history. However, comparing the groups prevent from omitting the threats.

In the following the sub-hypotheses of the study are cited. From this design, it will be possible to find out the following results. All sub-hypotheses are designed for both internal and external validity and effectiveness of the treatment.

2.4.1 Treatment Effectiveness

H₁: Q1 ≠ Q2; H₂: Q2 = Q5

Hypothesis 1 and 2 refers to the treatment effect that is if the hypotheses are accepted the treatment itself has impact on the participants. As seen on the Table 3, this treatment's effect is statistically significant. Also the comparison between Q2 and Q5 allows the researcher to determine the effect that the pretest has had upon the treatment. If the posttest results for these two groups differ, then the pretest has had some effect upon the treatment and the experiment is flawed (Shuttleworth, 2009).

2.4.2 History & Maturation

H₃: Q3 = Q6; H₄: Q1 = Q6

The comparison between the Q3 & Q6 and Q1 & Q6 allows the researcher to establish if any external factors have caused a temporal distortion. For example, it shows if anything else could have caused the results shown and is a check upon causality (Shuttleworth, 2009). At the same time, maturation is controlled with the same hypotheses.

H₅: Q1 = Q3

Additionally acceptance of the hypotheses (H₃, H₄, and H₅) also supports that the groups are related groups that is participants have homogeneous characteristics.

2.4.3 Pretesting

H₆: Q3 = Q4 (Pre-Test Bias); H₇: Q4 = Q6; H₈: Q1 = Q4 (Pre-Test Effect)

H₆ hypothesis is investigated to determine if the actual act of pretesting influenced the results. If the results indicate no significant difference, pre-test has no effect on participants. H₇ which refers the comparison between the Q4 and Q6 shows whether the pretest itself has affected behavior, independently of the treatment. If the results are significantly different, then the act of pretesting has influenced the overall results and is in need of refinement (Shuttleworth, 2009). Acceptance of the hypothesis H₈ also controls pre-test effect on participants.

3. Methodology

3.1 Research Design

Experimental design has been used to answer the research question of the study. An experimental design is a plan for assigning experimental units to treatment levels and the statistical analysis associated with the plan. It is suggested to use a 'single-blind' procedure in which participants are not informed about the nature of their treatment and, when feasible, the purpose of the experiment in order to minimize the effects of demand characteristics (Kirk, 1995). So in the study participants are not informed about the procedure and content of the treatment. At the same time period all data gathered and treatments are performed in the same week in order to control external factors (etc. exams).

In this study a single scale which assesses positive psychological capacities of participants is used (psycap-24 item version). The scale is adapted from Luthans et al. (2007b) and a 6-point likert type scale ranging from

“strongly disagree” to “strongly agree” is used in the measurement (original format). Demographic properties are similar for all participants. Age allocations are between 18 and 23. In addition to this, all of the participants are university students (from business department) and 52% of them are female.

Data is gathered from management students from Gebze Technical University in May 2014. 164 questionnaires, out of which four invalid and three were incomplete, were received. The resulting 156 valid questionnaires were used in the study. Questionnaires were allocated as hard copy (for pre-tests) and via e-mail (for post-tests). Solomon’s four group and six analyzing groups (Q1...Q6) have been developed as explained in the following.

(1) Assessed experimental group pre-tests are applied to 65 management students and the following week the group participated the psycap development training. The training program utilized a sample of 61 management students in two sections (Q1). They were told to have “career management” training. The treatment groups received a two-hour training intervention conducted by the same facilitator (Öznur Gülen Ertosun). About 10 days later the treatment, totally 41 valid questionnaires are obtained as post-test of the experimental group (Q2).

(2) Assessed control group received the same questionnaire in two time point about two week periods (Q3-Q4). As a pre-test 35 and post-test 24 valid questionnaire obtained (1 questionnaire from 25, was incomplete).

(3) For unassessed experimental group 25 management students participated to the training program (two-hour) and about 10 days later 24 participants answered the questionnaire (Q5). All the three training sections are organized in the same week.

(4) Rested management students (39 answered but 36 of them was completed) fall within unassessed control group, solely filled the questionnaire in one time point (Q6).

Table 2. Frequency and mean values of the groups

	E1		C1		E2	C2	Total
	Q1	Q2	Q3	Q4	Q5	Q6	Q1+Q2+Q3+Q4+Q5+Q6
Gender %-Male	31%	32%	63%	48%	52%	60%	48%
Gender %-Female	69%	68%	37%	52%	48%	40%	52%
Total Number	61	41	35	24	24	36	156
Psycap Mean	4,3780	4,5354	4,3678	4,4340	4,6951	4,4271	

3.2 Analyses and Findings

Positive psychological capital scale construct validity is testified in Luthans et al’s study (Luthans, Avolio, Avey, & Norman, 2007a) and cronbach alpha value is estimated above .70 (in this study .797). Paired samples t test is performed to test all hypotheses at the same time (this is also effective to prevent from type 1 and type 2 error).

According to analysis results all our hypotheses are accepted. As a result, treatment found effective ($H_1: Q1 \neq Q2$; $H_2: Q2 = Q5$) and biases are controlled ($H_3: Q3 = Q6$; $H_4: Q1 = Q6$ (History & Maturation); $H_5: Q1 = Q3$ (Homogeneity); $H_6: Q3 = Q4$ (Pre-Test Bias); $H_7: Q4 = Q6$; $H_8: Q1 = Q4$ (Pre-Test Effect)). As results are shown in Table 3, for Q1 and Q2 p value is lower than 0.5 (0.45) and for all other pairs significance value is upper than 0.5. That is there is a significant difference between pre-test and post-test results for the assessed experimental group and there is no significant difference for other test values.

Table 3. Paired samples t test for comparison of the groups

Paired Groups	Paired Differences						
	Mean Dif.	Std. Deviation	Std. Error Mean	t	df	Sig.(2-tailed)	
Pair1 (Q1-Q2)	-,29167	,76423	,13953	-2,090	29	,045	
Pair2 (Q3-Q4)	-,21711	,73815	,16934	-1,282	18	,216	
Pair3 (Q2-Q5)	-,10156	,52263	,13066	-,777	15	,449	
Pair4 (Q1-Q6)	-,32692	,90429	,17735	-1,843	25	,077	
Pair5 (Q3-Q6)	-,17210	,67400	,14054	-1,225	22	,234	
Pair6 (Q4-Q6)	,04167	,61442	,14096	,296	18	,771	
Pair7 (Q1-Q3)	-,09568	,88561	,17043	-,561	26	,579	
Pair8 (Q1-Q4)	-,19384	,79966	,16674	-1,163	22	,257	

4. Conclusion and Discussion

Although there are a growing number of articles about positive psychological capital, the study is done in order to fill the gap as Luthans et al. (2006) suggested that psychop development should be replicated in different cultural contexts. There is no empirical study out of Luthans et al. (2006, 2008, 2010, & 2012) replicating the treatment. So this study is a start point to contribute on the human resource development programs especially for Turkey. This study also provides empirical support for the effectiveness of the psychop development is possible with micro interventions (a training program of about 2 hours). In addition to this Solomon's four group design is examined thoroughly and performed. As discussed in earlier sections, the Solomon four group design has little attention especially in social sciences, too few study is done conducting an organizational training with Solomon design (etc. Holdnak et al., 1990) this study also has contribution to the related literature.

Further researchers can expand this model by adding individual and/or organizational factors as to moderate or mediate variables. And also predicting outcomes such as performance, wellbeing or engagement could be beneficial. Our hypothesis is limited to the general construct of psychop, researchers may investigate the effect of development programs on each individual dimension (hope-optimism-resilience-self efficacy) separately. This study has been conducted with student participants, similar studies also should be replicated with employees from different sectors. Participants' individual characteristics such as demographics, personality, experience, etc. should also be considered as moderators. In addition to these, as Luthans et al. mentioned psychop development also can be effective on collective psychop, and this proposal can be empirically investigated in a longitudinal study. Experimental design is an important aspect especially for social and behavioral sciences, so Solomon or alternatives controlling internal and external validity should be discussed much more in the future studies.

Our experiment conducted in a developing country confirm the findings of recent empirical studies on the positive effects of psychop development programs to the performance of both employees and firms. Accordingly, as for the managerial implications, not only during the psychop development programs but also in daily manager-employee interactions such concepts as hope, optimism, resilience and self-efficacy should be given equal importance as other basic work values. Especially middle managers should accept and adopt these values. However, psychop development may produce some side effects to the organizations. As earlier studies emphasize, congruence between the individual values and goals of the employees and the strategic intentions and goals of their company is an important opportunity for these companies (e.g. Eren et al., 2000); but if they are not compatible both employee motivation and commitment and company performance may decline. Beyond empirical findings during the conversations with participants, it is seen that increased awareness and willingness about psychop may sometimes lead some participants to begin to look for other organizations to work if they believe that in the present organization their opportunities to increase their self-efficacy or resilience cannot be achieved. Therefore, the developers of psychop training programs should pay extra attention for the concept of goal congruence, otherwise training may end up with increased turnover. As a conclusion, we may suggest that psychop is very beneficial but development programs should be designed very carefully and implemented by experienced moderators.

References

- Avey, J., B. (2007). *The performance impact of leader positive psychological capital and situational complexity* (Unpublished doctoral dissertation). The Gallup Leadership Institute, University of Nebraska-Lincoln.
- Avolio, B. J., & Luthans, F. (2006). *The higher impact leader: Moments matter for accelerating authentic leadership development*. USA: McGraw-Hill.
- Babbie, E. (2013). *The basis of social research* (16th ed.). Belmont, USA: Wadsworth Cengage Learning.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Braver, M. C. W., & Braver, S. L. (1988). Statistical treatment of the solomon four-group design: A meta-analytic approach. *Psychological Bulletin*, *104*(1), 150-154. <http://dx.doi.org/10.1037/0033-2909.104.1.150>
- Breakwell, G. M. (2004). *Doing social psychology research*. British Psychological Society and Blackwell Publishing Ltd. <http://dx.doi.org/10.1002/9780470776278>
- Campbell, D. T., & Stanley, J. C. (1966). *Experimental and quasi-experimental designs for research*. Houghton Mifflin Company: Boston.
- Carver, C. S., & Scheier, M. S. (2002). Optimism. In C. R. Snyder & S. J. Lopez (Eds.), *Handbook of positive psychology* (pp. 231-243). Oxford, United Kingdom: Oxford University Press.

- Cortese, J. (2007). *Internet learning and building of knowledge*. New York: Cambria Press.
- Coutu, D. L. (2002). How resilience work. *Harvard Business Review*, May 2002.
- Eren, E., Aren, S., & Alpkan, L. (2000). İşletmelerde Stratejik Yönetim Faaliyetlerini Değerlendirme Araştırması. *Doğuş Üniversitesi Dergisi*. 1(1), 96-123.
- Faigenbaum, D., & Costello, R. M. (1975). Solomon design analysis of multiple-choice Rorschach animal content. *Journal of Personality Assessment*, 39(5), 466-470. http://dx.doi.org/10.1207/s15327752jpa3905_4
- Fresco, D. M., Moore, M. T., Walt, L., & Craighead, L. W. (2009). Self-administered optimism training: mechanisms of change in a minimally supervised psychoeducational intervention. *Journal of Cognitive Psychotherapy: An International Quarterly*, 23(4), 350-367. <http://dx.doi.org/10.1891/0889-8391.23.4.350>
- Gibson, J. L., Ivancevich, J. M., & Donnelly, J. H. J. (1988). *Organizations: Behavior, structure and processes*. Business Publications Inc., Plano, TX.
- Gist, M. E., Stevens, C. K., & Bavetta, A. G. (1991). Effects of self-efficacy and post-training intervention on the acquisition and maintenance of complex interpersonal skills. *Personnel Psychology*, 44(4), 837-861. <http://dx.doi.org/10.1111/j.1744-6570.1991.tb00701.x>
- Glinger, J. A., & Morgan, G. A. (2000). *Research methods in applied settings: An integrated approach to design and analysis*. Lawrence Erlbaum Associates Inc.
- Holdnak, B. J., Clemons, T. C., & Bushardt, S. C. (1990). Evaluation of organization training by the Solomon four group design: A field study in self-esteem training. *Journal of Managerial Psychology*, 5(5), 25-31. <http://dx.doi.org/10.1108/02683949010136251>
- Isaac, S., & Michael, W. B. (1981). *Handbook in research and evaluation* (2nd ed.). California: San Diego, EdITS.
- Kirk, R. E. (1995). *Experimental design: Procedures for the behavioral sciences* (3rd ed.). California: Pacific Grove, Brooks/Cole.
- Kossek, E. E., Roberts, K., Fisher, S., & Demarr, B. (1998). Career self-management: A quasi-experimental assessment of the effects of a training intervention. *Personnel Psychology*, 51, 935-962. <http://dx.doi.org/10.1111/j.1744-6570.1998.tb00746.x>
- Luthans, F., & Youssef, C. M. (2004). Human, social, and now positive psychological capital management: Investing in people for competitive advantage. *Organizational Dynamics*, 33, 143-160. <http://dx.doi.org/10.1016/j.orgdyn.2004.01.003>
- Luthans, F., Luthans, B., & Luthans, K. (2004). Positive psychological capital: Beyond human and social capital. *Business Horizons*, 47, 45-50. <http://dx.doi.org/10.1016/j.bushor.2003.11.007>
- Luthans, F., Avey, J. B., Avolio, B. J., Norman, S. M., & Combs, G. M. (2006). Psychological capital development: Toward a micro-intervention. *Journal of Organizational Behavior*, 27, 387-393. <http://dx.doi.org/10.1002/job.373>
- Luthans, F., Avolio, B. J., Avey, J. B., & Norman, S. M. (2007). Psychological capital: Measurement and relationship with performance and satisfaction. *Personnel Psychology*, 60, 541-572. <http://dx.doi.org/10.1111/j.1744-6570.2007.00083.x>
- Luthans, F., Youssef, C. M., & Avolio, B. J. (2007). *Psychological capital: Developing the human competitive edge*. USA: Oxford University Press.
- Luthans, F., Avey, J. B., & Patera, J. L. (2008). Experimental analysis of a web-based intervention to develop positive psychological capital. *Academy of Management Learning and Education*, 7, 209-221. <http://dx.doi.org/10.5465/AMLE.2008.32712618>
- Luthans, F., Avey, J. B., Avolio, B. J., & Peterson, C. (2010). The development and resulting performance impact of positive psychological capital. *Human Resource Development Quarterly*, 21(1), 41-67. <http://dx.doi.org/10.1002/hrdq.20034>
- Luthans, B. C., Luthans, K. W., & Jensen, S. M. (2012). The impact of business school students' psychological capital on academic performance. *Journal of Education for Business*, 87(5), 253-259. <http://dx.doi.org/10.1080/08832323.2011.609844>

- Masten, A. S. (2001). Ordinary magic: Resilience processes in development. *American Psychologist*, 56, 227-239. <http://dx.doi.org/10.1037//0003-066X.56.3.227>
- McCambridge, J., Butor-Bhavsar, K., Witton, J., & Elbourne, D. (2011). Can research assessments themselves cause bias in behaviour change trials? A systematic review of evidence from solomon 4-group studies. *PLoSOne*. <http://dx.doi.org/10.1371/journal.pone.0025223>
- McGahee, T. W., & Tingen, M. S. (2000). The effects of a smoking prevention curriculum on fifth-grade children's attitudes, subjective norms and refusal skills. *Southern Online Journal of Nursing Research*, 1(2), 1-28.
- McGahee, T. W. & Tingen, M. S. (2009). The use of the solomon four-group design in nursing research. *Southern Online Journal of Nursing Research*, 9(1).
- Nelson, D. L., & Cooper, C. L. (2007). *Positive Organizational Behavior: Accentuating the Positive at Work*. Sage Publications.
- Newman, I., & Newman, C. (1994). *Conceptual statistics for beginners* (2th ed.). University Press of America Inc.
- Oettingen, G. (1995). Explanatory style in the context of culture. In G. M. Buchanan & M. E. P. Seligman (Eds.), *Explanatory style* (pp. 209-224). Hillsdale, NJ: Erlbaum
- Peterson, C., Semmel, A., Baeyer, C. V., Abramson, L. Y., Metalsky, G. I., & Seligman, M. E. P. (1982). The attributional style questionnaire. *Cognitive Therapy and Research*, 6(3), 287-300. <http://dx.doi.org/10.1007/BF01173577>
- Qingshan, H., Le, L., & Xuansheng, C. (2014). Research of employees psychological capital structure under the background of Chinese culture. *International Business Research*, 7(7), 175-182. <http://dx.doi.org/10.5539/ibr.v7n7p175>
- Randolpf, K. A., & Myers, L. L. (2013). *Basic statistics in multivariate analysis*. New York: Oxford University Press. <http://dx.doi.org/10.1093/acprof:oso/9780199764044.001.0001>
- Salkind, N. J. (2010). *Encyclopedia of research design*. 1, USA: Sage publications. <http://dx.doi.org/10.4135/9781412961288>
- Sawilowsky, S. S., & Markman, B. S. (1988). Another look at the power of meta-analysis in the solomon four group design. *The Educational Resources Information Center (ERIC)*, ED 316 556. <http://dx.doi.org/10.2466/pms.1990.71.1.177>
- Sawilowsky, S., Kelley, D. L., Blair, R. C., & Markman, B. S. (1994). Meta-Analysis and the solomon four-group design. *The Journal of Experimental Education*, 62(4), 361-376. <http://dx.doi.org/10.1080/00220973.1994.9944140>
- Schaufeli, W. B. (2004). The future of occupational health psychology. *Applied Psychology: An International Review*, 53, 502-517. <http://dx.doi.org/10.1111/j.1464-0597.2004.00184.x>
- Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist*, 55, 5-14. <http://dx.doi.org/10.1037/0003-066X.55.1.5>
- Sevilla, C. G., Ochave, J. A., Punsalan, T. G., Regala, B. P., & Uriarte, G. G. (1992). *Research methods*. Philippine: Rex Book Store.
- Shuttleworth, M. (2009). *Solomon four-group design*. Retrieved on 11th march 2015 from [http://www.experiment_resources.com/solomon-Four group-design.htm](http://www.experiment_resources.com/solomon-Four%20group-design.htm)
- Snyder, C. R. (2000). *Handbook of hope: Theory, measures and applications*. USA: Academic Press.
- Solomon, R. L. (1949). An extension of control group design. *Psychological Bulletin*, 46, 137-150. <http://dx.doi.org/10.1037/h0062958>
- Spector, P. E. (1981). *Research Designs, Series: Quantitative Applications in the Social Sciences*. Sage University Paper, p. 23. <http://dx.doi.org/10.4135/9781412985673>
- Stajkovic, A. D., & Luthans, F. (1998). Social cognitive theory and self-efficacy: Going beyond traditional motivational and behavioral approaches. *Organizational Dynamics*, 26, 62-74. [http://dx.doi.org/10.1016/S0090-2616\(98\)90006-7](http://dx.doi.org/10.1016/S0090-2616(98)90006-7)

- Stajkovic, A. D. (2006). Development of a core confidence-higher order construct. *Journal of Applied Psychology, 91*, 1208-1224. <http://dx.doi.org/10.1037/0021-9010.91.6.1208>
- Zhao, Z., & Hou, J. (2009). The study on psychological capital development of intrapreneurial team. *Journal Psychological Studies, 1*(2), 35-40. <http://dx.doi.org/10.5539/ijps.v1n2p35>

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/3.0/>).