Development and Validation of Psycho-Moral Strength (PMS) Scale for University Lecturers*

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Abstract

This study aims at constructing psycho-moral strength scale (PMS) which consisted of four important psychological characteristics, namely, 1) need for achievement, 2) internal locus of con-trol, 3) future orientation and self-control, and 4) moral identity. These four factors were derived from the Thai psychological theory of moral and work behavior which has been strongly confirmed by empirical data. In the first study with the total of 700 university lecturers, four-factor model emerged from exploratory factor analysis which could explain the variance for 55.16%. The con-firmatory factor analysis indicated the fit model. In the second study, validation in terms of incre-mental validity using hierarchical regression analysis on academic behavior of 128 university lec-turers revealed that psycho-moral strength significantly yielded the predictive percentage

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beyond core self-evaluation (CSE) and psychological capital (PsyCap) with 22.80%. In addition, the mag-nitude of prediction of the psycho-moral strength scale was significantly higher in the more aca-demically successful lecturers. Furthermore, PMS showed stronger relation with CSE (r = 0.604, p<.01) than PsyCap (r = 0.399, p<.01). These results lead to a new approach for future research, intervention, and assessment to enhance desirable behaviors.

Keywords: Psychological Scale, Factor Analysis, Academic Behavior

การพัฒนาและประเมินแบบวัดจิตพลังจริยธรรม สำหรับอาจารย์มหาวิทยาลัย*

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รับวันที่ 17 กรกฎาคม 2565 *ส่งแก้ไขวันที่ 14 ธันวาคม 2565* *ตอบรับตีพิมพ์วันที่ 27 ธันวาคม 2565*

บทคัดย่อ

งานวิจัยนี้มีจุดประสงค์เพื่อสร้างแบบวัดใหม่ที่เรียกว่า “จิตพลังจริยธรรม” (Psycho-moral strength scale: PMS) ซึ่งประกอบด้วยจิตลักษณะที่สำคัญ 4 ประการ ได้แก่ 1) แรงจูงใจใฝ่สัมฤทธิ์ 2) ความเชื่ออำนาจในตน 3) ลักษณะมุ่งอนาคตควบคุมตน และ 4) เอกลักษณ์ทางจริยธรรม จิตลักษณะทั้ง 4 ประการนี้ มีพื้นฐานมาจากทฤษฎีต้นไม้จริยธรรมซึ่งได้รับการสนับสนุนจากข้อมูลเชิงประจักษ์จากผลวิจัยจำนวนมาก การวิจัยในขั้นแรกมีจำนวนตัวอย่างเป็นอาจารย์ในมหาวิทยาลัยในประเทศไทยรวม 700 คน ผลการวิเคราะห์องค์ประกอบเชิงสำรวจปรากฏทั้ง 4 องค์ประกอบข้างต้น ซึ่งสามารถอธิบายความแปรปรวนของตัวแปร รวมได้ 55.16% โมเดลการวัดนี้มีความกลมกลืนกับข้อมูลเชิงประจักษ์เมื่อนำมาวิเคราะห์องค์ประกอบเชิงยืนยัน ในขั้นที่สอง พบความตรงในเชิงการทำนายเพิ่มขึ้น โดยการวิเคราะห์ถดถอยพหุเชิงชั้นในกลุ่มตัวอย่างใหม่ที่เป็นอาจารย์มหาวิทยาลัย จำนวน 128 คน ปรากฏผลว่าแบบวัดจิตพลังจริยธรรมใหม่นี้สามารถทำนายพฤติกรรมการแสวงหาและใช้ความรู้ทางวิชาการได้เพิ่มขึ้นจากการทำนายด้วยแบบวัดการประเมินแก่นแห่งตนและแบบวัดทุนทางจิตวิทยาเชิงบวก ในปริมาณ 22.80% รวมทั้งยังพบว่า

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อาจารย์ที่มีจิตพลังจริยธรรมมากมักเป็นผู้ที่ประสบความสำเร็จทางวิชาการมากด้วย นอกจากนี้ยังปรากฏว่า จิตพลังจริยธรรมมีความสัมพันธ์ทางบวกกับการประเมินแก่นแห่งตน ($r = 0.604$, $p<.01$) มากกว่ากับทุนทางจิตวิทยาเชิงบวก ($r = 0.399$, $p<.01$) ผลจากงานวิจัยนี้นำไปสู่แนวทางใหม่ในการศึกษาวิจัย, การพัฒนา และการวัดเพื่อเสริมสร้างพฤติกรรมที่น่าปรารถนา

คำสำคัญ: ความเป็นปึกแผ่นของครอบครัว การเกื้อกูลระหว่างรุ่นวัย ผู้สูงอายุ ประเทศไทย

Introduction

As rapidly approaching normal era after a long battle with COVID-19, scholars and practi-tioners seem to need comprehensive, accurate, and effective measures in many aspects for practi-cal, precise, less cost, and broader explanation research and development. Another important con-cern for measurement needs is to construct the scale that is suitable and reliable for local, but pow-erfully connects with global characteristics. This is a challenging endeavor for researchers, espe-cially psycho-behavioral scientists.

In the previous century, individual psychological characteristics were examined as im-portant antecedents of a person's behavior, e.g., intelligence (Piaget, 1936), self-regulation (Ban-dura, 1986), and moral reasoning ability (Kohlberg, 1974). Researchers had put great effort on searching for meaning or definition of these important individual constructs. Some groups of re-searchers had tried to construct these measurements. For example, achievement motive or need for achievement construct was measured by many simple scales in the form of several pictures (Her-mans,1970), such as, Thematic Apperception Test (McClelland, Atkinson, Clark, & Lowell, 1953), and the Iowa Picture Interpretation Test (Johnston, 1957).

Another example of popular single construct that has been widely measured is attitude which is defined as an evaluative knowledge and personal feelings towards an object and abstract concept. Attitude has been getting attention in research studies both in science, such as attitudes towards nuclear powerplant (Bhanthumnavin & Bhanthumnavin, 2014; Fang, Qu, Sun,Wu, & Wei, 2022), attitude towards robots (Gou, Webb, & Prescott, 2021), as well as, in social science, such as attitude towards health prevention (Gibbons, Stein, Springer, Roemhild, Meadows, & Dowling, in press), attitude towards aging (Liu, Duan, & Xu, 2020). Many important theories included attitude as one of the most important predictors of human behaviors (Davis, 1989; Ajzen & Fishbein, 1980).

However, within the last two decades, the concept of multi-construct trait has been and widely researched and used. Due to many recent studies, especially in Thailand (e.g., Kraiprasit, Bhanthumnavin & Bhanthumnavin, 2022) which revealed the confident findings that human be-havior is affected by several important psychological characteristics together at the same time, ra-ther than an only single psychological characteristic.

In addition, the field of measurement construction has become more popular the research-ers' interest once again due to the introduction of many new statistical approaches, especially fac-tor analysis approach, as well as more friendly used softwares, e.g., MPLUS, AMOS, LISREL. These softwares give the researchers more power to analyze and to synthesize the dimensions of a construct or many constructs which bring broader and more in-depth understanding of a new high-er-order multidimensional construct.

In this paper, a new "psycho-moral strength" (PMS) scale is introduced. It is a higher-order multidimensional construct which was based on more than thirty years of research and conceptual-ized in theory of work and moral behavior (Bhanthumnavin, 1983). PMS construct is consisted of four important psychological characteristics which have been identified as important predictors in numerous studies both in Thailand and abroad.

Previous examples of higher-order multidimensional construct

In the past, a few high-order constructs had been introduced. For example, Big Five person-ality can be traced back in 1940-1960 (Cattel, 1943; Norman, 1963). The construct of five psycho-logical characteristics were originally obtained by peer rating (John &y Srivastava, 1999). A large pool of traits was associated with this construct. Five-Factor Model (FFM) rooted from the Big Five was investigated by McCrae and Costa (1997). The FFM consisted of five important single constructs, namely neuroticism (emotional instability), extraversion, openness to experience, agreeableness, and conscientiousness. The Big Five scale was translated and validated cross-culture. Many studies validated this construct by using advanced statistical method, especially fac-tor analysis. Several studies revealed that variant of some dimensions relating to cultural or social context (Yang & Bond, 1990). Some dimensions had split into sub dimensions. For example, the variant was found in agreeable dimension in both European (Boies, Lee, Ashton, Pascal, & Nicol, 2001; Di Blas & Forzi, 1998; Szirmak & De Raad, 1994), and Asian (Hahn, Lee, & Ashton, 1999). Furthermore, some studies suggested of dimension combination that reduced into less than five factors (e.g., Goldberg & Somer, 2000; Krueger & Tackett, 2003; Ostendorf, 1990; Saucier, 1997).

Another important higher-order construct is core self-evaluation (CSE) with the aim of as-sessing positive self-concept (Judge, Locke, and Durham, 1997). The original area of study was in organization context as to examine the important antecedent of job satisfaction, which ultimately affects job performance (Judge, Erez, & Bono, 1998). Core self-evaluation construct consists of four single important constructs, namely, self-esteem (e.g., Harter, 1990; Rosenberg, 1979), gener-alized self-efficacy (e.g., Bandura, 1982; Locke, McClear, & Knight, 1996), locus of control (Rot-ter, 1966), and emotional stability (low neuroticism) (e.g., Goldberg, 1981; Watson, 2000) which emphasized three criteria as evaluation-focus, fundamentality, and broader scope (Judge & Bono, 2001). Although, these four single constructs in CSE were form the research evidence in eight lit-erature themes (e.g., clinical psychology research, child development theory, personality theory, and social psychology), the 12-items CSE scale was carefully constructed, statistically tested, and nomological network validated (Judge, Erez, Bono, & Thoresen, 2003). CSE scale has been vali-dated by factor analysis in many studies, and still held the dimension integrity (e.g., Bhan-thumnavin, 2015; Sharma & Misra, 2017).

Psychological capital (PsyCap) construct is one of the well-known higher-order multidi-mensional constructs introduced by Luthans (2002). Originally from human resource capital con-cept, PsyCap is consisted of four claimed competitive advantage constructs for performance im-provement, called "HERO", namely, hope, self-efficacy, resilience, and optimism (Luthans & Youssef, 2004) which based on positive psychology approach (Seligman & Csikszentmihalyi, 2000). These four constructs together, as "psychological resource caravan" are malleable, state-like constructs that affect psychological and behavioral outcomes (Luthans, Avolio, Avey, & Nor-man, 2007). PsyCap scale has been widely used and validated in many languages, e.g., Chinese (Luo, Tsai, Su, Kim, Gao, & Chen, 2022), India (Kumar, Upadhyay, Yadav, & Goyal, 2022), Tai-wan (Wu & Nguyen, 2022), and United Kingdom (Barratt & Duran, 2021). Consequently, both CSE scale and PsyCap scale were selected to be statistically compared with the new PMS scale in this study.

Psycho-moral strength: origin and definition

In 1980's, the indigenous Thai psychological theory, named "Psychological Theory of Mor-al and Work Behavior" was introduced by Bhanthumnavin (1983;1995). This theory emerged from research evidence during 1974-1980 in Thailand that there are eight core psychological disposi-tions affecting desired behaviors. These eight psychological constructs are divided into two levels, depicted in picture of a healthy growing tree (Figure 1).

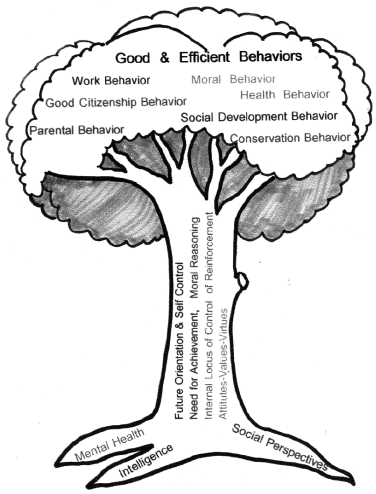

Figure 1: Psychological theory of work and moral behavior (Bhanthumnavin, 1983)

The first level is tree roots. It consists of huge-firmed taproots representing three funda-mental psychological characteristics, i.e., 1) mental health 2) intelligence (based on Piaget's theo-ry, 1971) and 3) social perspective taking (Coke, Batson, & McDavis, 1978). These are the primary dispositions that should be inculcated from the early stage of life. This similar concept also sug-gested by the HeadStart Project (Zigler & Valentine, 1979; Zigler & Muenchow, 1992). These three traits at the root can affect another five psychological characteristics on tree trunk. These five psychological characteristics are 1) attitude (based on Krech, Crutchfield, & Ballachey, 1962), value, and virtue, 2) need for achievement (based on McClelland, 1965), 3) future orienta-tion and self-control (based on Bandura, 1986; Mischel, 1974; de Volder & Lens, 1982) internal locus of control (based on Rotter, 1966), and 5) moral reasoning ability (based on Kohlberg, 1974).

This theory suggested that a person is like a tree. These eight psychological characteristics were found to be the important antecedents of fruitful psychological and behavioral outcomes (on the treetop) of wide range of population from primary school students through elder persons in more than 300 studies.

In recent decades, empirical evidence in Thailand on psychological antecedents of various types of behavior have indicated four distinguished psychological characteristics (Bhanthumnavin & Bhanthumnavin, 2021) as reflected in the psychological theory of work and moral behavior (Bhanthumnavin, 1983). The first psychological characteristic is moral reasoning/identity-deci-sion making with appropriate rational and reflecting ethical identities of a person's intention to follow rules and regulation for producing good outcomes. Several important theories and concepts can be used in relation with this disposition, e.g., moral reasoning ability (Kohlberg, 1974), moral identity (Aquino & Reed, 2000), moral disengagement (Bandura, 2002). The second psychological characteristic is locus of control, based on Rotter's theory (1966) relates to the belief of a person in his or her ability to predict and control an outcome with different amount of effort. The closely related variables which could be interchanged, e.g., self-efficacy (Bandura, 1986), perceived be-havioral control (Ajzen, 1991). The third psychological characteristic is achievement motive. It focuses on forces or energies that drive an individual to plan for increasing facilitators and elimi-nating inhibitors to accomplish goals. There are many important psychological theories that in-volve this construct, i.e., McClelland's theory (1965), Maslow's theory (1943), Vroom's theory (1964). The fourth psychological characteristic is future orientation and self-control. This con-struct is rather psycho-skill in nature. It consists of an ability of an individual to value future re-wards as much or more than their immediate, but less favorable outcomes. However, the skill as-pect of the construct is a person's ability to divide main goal into sub-goals to achieve that out-come. During the pathway, self-control plays an important role to assist an individual to stay on track from the first sub-goal all the way to achieve the main goal.

All these four psychological characteristics together is so called "Psycho-Moral Strength" (PMS) which considered as "psychological force" that can direct, energize, and drive a person to produce desired psychological and behavioral outcomes. These four psychological characteristics in this measure are considered as "trait-like" because they are not emphasized on a particular con-text or circumstance.

Phase 1

Research hypotheses

This study was a part of research project funded by 2017 government budget grant under the research program, titled, "Psycho-moral strength in research and training of lecturers for stu-dents' development" (Bhanthumnavin, 2023). There are two hypotheses in this study.

Hypothesis 1: By performing exploratory factor analysis, psycho-moral strength scale is composed of at least three factors with at least two items for each factor, with the cumulative per-centage of at least 60%.

Hypothesis 2: By performing confirmatory factor analysis, the underlying latent constructs emerging from the EFA for the psycho-moral strength scale is confirmed by another set of data.

Methodology

Participants

In this first phase, the total of 700 university lecturers from Thai public universities in Bangkok and outer provinces were obtained. The data were divided into three steps for data analy-sis as follows: 1) item quality 2) exploratory factor analysis (EFA) and 3) confirmatory factor analysis (CFA). The details of participant biosocial characteristics of each step are shown in Table 1.

Table 1: Biosocial characteristics of participants in three steps of analysis.

Characteristics	Step1- Item quality	Step 2- EFA	Step 3 - CFA
Gender	Males = 26 (26.00%) Females = 74 (74.00%)	Males = 97 (32.40%) Females = 202 (7.60%)	Males = 87 (29.00%) Females = 213 (71.00%)
Age	Mean = 41.24 years Median = 40.00 years SD = 8.99	Mean = 41.61years Median = 39.00 years SD = 8.84	Mean = 41.54 years Median = 40.00 years SD = 9.32
Duration after graduation	Mean = 12.39 years Median = 10.00 years SD = 10.52	Mean = 11.62 years Median = 8.00 years SD = 9.66	Mean = 11.10 years Median = 8.00 years SD = 9.48
N	**100**	**300**	**300**

Measures

Psycho-moral strength (PMS). This construct was derived from the Thai Psychological Theory of Moral and Work Behavior (Bhanthumnavin, 1995). PMS was initially defined as having four components, namely, 1) moral reasoning and/or identity, 2) need for achievement, 3) internal locus of control, and 4) future orientation and self-control (Bhanthumnavin & Bhanthumnavin, 2021). The researchers constructed pool of items for each component. A group of experts in psy-cho-behavioral science screened and critiqued for content validity before trying out. The scale was measured by the items with 6-point Likert scale ranging from "absolutely true" to "not true at all"

Procedure

Data collecting process was administered at the first session of training programs for uni-versity lecturers. Before starting the process, the questionnaire was explained. The participants were informed that they had right to leave at any time. It took about 45 minutes to fill out the pa-per-based questionnaire. The small token for each participant was delivered as an appreciation.

Data analysis

For item quality, item discrimination with t-ratio at least 2.0 was computed.

The items passed these criteria were used in exploratory factor analysis. There were four criteria for EFA as follows: 1) Kaiser-Meyer-Olkin test as a measure of sampling adequacy should be greater than 0.60, 2) the Bartlett test of sphericity should be significant, 3) the emerging meas-urement model should have at least 3 components, each with at least 2 items, and 4) the total cu-mulative percentage of all components explaining should be more than 60%.

The emerging measurement model was confirmed by second-order confirmatory factor analysis for construct validity testing. The five most used indices for CFA are non-significant chi-square value (Jöreskog & Sörbom, 1996), a root mean square error of approximation (RMSEA) value of less than 0.50 (Browne & Cudeck, 1993), a comparativet index (CFI) of at least 0.90 (Bentler,1990), Tucker-Lewis Index (TLI) of at least 0.95 (Tucker & Lewis, 1973), a standardized root mean square residual (SRMR) of less than 0.80 (Hu & Bentler, 1998).

Results - Phase 1

Step 1: Item quality

The initial pool of items of PMS consisted of 24 items. It was divided into 4 components, namely, 1) need for achievement 2) internal locus of control 3) future orientation and self-control, and 4) moral identity. The results from item discrimination using data from 100 participants re-vealed that 1 item was excluded.

Step 2: Exploratory factor analysis

The 23 items passing the t-ratio criterion were used in the EFA step and tested with data of another 300 participants. The EFA findings showed an adequate fit of Kaiser-Meyer-Olkin test (KMO = 0.75) with a significant Bartlett test of sphericity (χ^2 = 518.06, df = 66, p<.000). The four-factor measurement model was emerged which supported the hypothesis 1 (Table 2).

Table 2: EFA results of PMS scale

		Items	Components			
			1	2	3	4
1	pc20	I enjoy situation in which I can have an op-portunity to use my ability (ฉันรู้สึกสนุกกับสถานการณ์ที่ทำให้ฉันมีโอกาสได้ใช้ความสามารถของฉัน) (+)	0.82			
2	pc19	When I face with problem which is not beyond my ability, I am enthusiastic to cope with it immediately. (เมื่อฉันกำลังเผชิญกับปัญหาซึ่งน่าจะแก้ไขได้ ฉันกระตือรือร้นที่จะลงมือทำทันที) (+)	0.81			
3	pc23	I increase my effort every time I work onthe tasks which come to me consecutively. (ฉันจะพยายามมากขึ้นในการทำงานชิ้นต่อ ๆ ไป) (+)	0.73			
4	pc28	“Perceived as being honest” is more im-portant than “actually being honest” (การที่ “ผู้อื่นคิดว่าเราเป็นคนซื่อสัตย์” สำคัญกว่าการที่ “เราเป็นคนซื่อสัตย์จริง ๆ”) (-)		0.73		

Table 2: EFA results of PMS scale (Continue)

		Items	Components			
			1	2	3	4
5	pc30	I usually follow my group decision even though it may not be morally appropriate. (ฉันจะทำตามการตัดสินใจของกลุ่มถึงแม้ว่าจะผิดทำนองคลองธรรม) (-)		0.65		
6	pc1	Good work product which is not acceptable by the supervisor is rather worthless. (ผลงานที่ผู้บังคับบัญชาไม่ยอมรับ แม้จะเป็นผลงานที่ดีแต่ก็ไร้ค่า) (-)		0.62		
7	pc29	If someone is aggressive to me, I will return him (or her) with equal treatment. (ถ้าผู้อื่นร้ายมาฉันก็จะร้ายตอบ) (-)			0.73	
8	pc2	When visiting foreign places, I think we can do what we like, because nobody knows us. (เมื่ออยู่ต่างถิ่นฉันคิดว่าจะทำอะไรก็ทำได้ เพราะไม่มีใครรู้จักฉัน) (-)			0.54	
9	pc18	What I do in my life, I usually have someone guiding or controlling me. (ชีวิตของฉันมักมีผู้อื่นคอยชี้ทางหรือควบคุม) (-)			0.53	
10	pc15	Most of my success in life happened by chance. (ความสำเร็จของฉันส่วนใหญ่มาจากความบังเอิญ) (-)			0.43	
11	pc3	I am more careful at work only when someone is observing or watching. (ฉันจะระมัดระวังในการทำงานเฉพาะเมื่อรู้ว่ามีผู้อื่นมาคอยสังเกตอยู่) (-)				0.73
12	pc14	I do not belief in “luck” or “chance” concerning life-outcomes. (ฉันไม่เชื่อเรื่องโชคเคราะห์หรือความบังเอิญ) (+)				0.72
		Eigenvalue	2.98	1.47	1.15	1.00
		% of Variance	24.89	12.27	9.62	8.38
		Cumulative%	24.89	37.16	46.78	55.16

The first factor with the eigenvalue of 2.98 was labelled as “need for achievement”. This factor includes 3 items which account for 24.89% of the variance of the PMS construct. All items were positive direction.

The second factor consisted of 3 items with the eigenvalue of 1.47 which was labelled as “moral identity” which could additionally explanation the variance of PMS construct with 12.27%. Thus, it led to the total cumulative variance explanation of 37.16% All items were negative direc-tion.

The third factor with the eigenvalue of 1.15 consisted of 4 items, which can be labelled as “future orientation and self-control”. All items were negative direction. It could additionally ex-planation the variance of PMS construct with 9.62%, which led to the total cumulative variance explanation of 46.78%.

The last factor with 2 items and the eigenvalue of 1.00 was consisted of two items, labelled as “locus of control”. It could additionally explanation the variance of PMS construct with 8.38%, which led to the total cumulative variance explanation of 55.16%. The reliability of the 12-item PMS scale in this EFA step in terms of alpha reliability was 0.67, Omega reliability was 0.63, and GLB reliability was 0.77.

Step 3: Second-order confirmatory factor analysis

The results of a second-order factor analysis from another set of data from 300 participants indicated a model fit with a chi-square value of 62.38 (df = 51, p value = 0.13), RMSEA = 0.027, CFI = 0.97, TLI = 0.96, SMRS = 0.04, which supported hypothesis 2. (Figure 2). The reliability of the 12-item PMS scale in this CFA step in terms of alpha reliability were 0.66, Omega reliability was 0.63, and GLB reliability was 0.75. The relationship between the four facets is presented in Table 3.

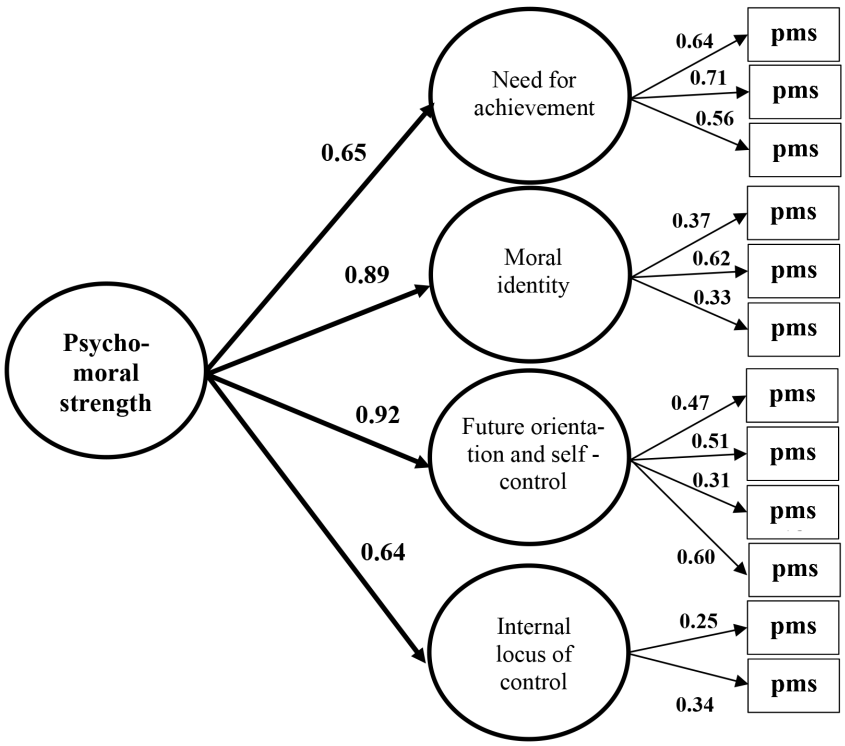

Figure 2: Second-order factor analysis of psycho-moral strength scale in Thai university lecturers

The highest gamma value of 0.92 belonged to the factor "future orientation and self-control". The highest standardized factor loading in this factor was found in item 15, followed by item 2, item 29, and item 18.

The second factor with gamma value of 0.89 was the factor "moral identity". The highest standardized factor loading in this factor was found in item 30, followed by item 18, and item 1.

The third factor with gamma value of 0.65 was the factor "achievement motive". The high-est standardized factor loading in this factor was found in item 19 followed by item 20, and item 23.

The last factor with gamma vale of 0.64 was the factor "internal locus of control". The highest standardized factor loading in this factor was found in item 14 followed by item 3.

Table 3: Correlations between the four facets in PMS model

	Variables	1	2	3	4	5
1	Need for achievement	1				
2	Moral identity	.294**	1			
3	Future orientation and self-control	.389**	.412**	1		
4	Internal locus of control	0.058	.172**	.284**	1	
5	Psycho-Moral Strength	.583**	.734**	.810**	.544**	1

Note: *p<.05; ** p<.01.

Phase 2

Research hypotheses

In this step, the validation of the new psycho-moral strength scale was assessed. Two hy-potheses were generated.

Hypothesis 3: The correlation coefficient between PMS and CSE is higher than the correla-tion coefficient between PMS and PsyCap.

Hypothesis 4: PMS yields significant higher predictive power beyond CSE and PsyCap in predicting academic behavior.

Methodology

Participants

In this step, the total of 128 university lecturers from Thai public universities were ob-tained. The same data gathering procedure was repeated. There were 36 males (28.10%), 90 fe-males (70.30%), and 5 not identified gender (1.60%) with the average age of 40 years (SD = 8.30). Sixty-six lecturers graduated with Master's degree (51.60%), 57 lecturers obtained an Ph.D. (44.50%), and the rest not identified (3.90%)

Measures

Academic behavior (AB). Based on ambidexterity concept (March,1999), this construct was defined as searching and using academic knowledge and information for enhancing students' de-velopment (Bhanthumnavin, 2018). The total of 12 items, each attached with 6-point Likert scale ranging from "absolutely true" to "not true at all". with the reliability of 0.85.

Core self-evaluation (CSE) was based on Judge, Erez, Bono, and Thoresen. (2003). This construct consisted of four components, namely, 1) generalized self-efficacy 2) self-esteem 3) lo-cus of control and 4) neuroticism. The total of 12 items, each attached with 6-point Likert scale ranging from "absolutely true" to "not true at all", with the reliability of 0.84.

Psychological Capital (PsyCap), based on Luthans and Youssef (2004) The total of 12 items can be summarized into 4 dimensions, namely, self-efficacy, optimism, hope, and resilience. Each item was attached with 6-point Likert scale ranging from "absolutely true" to "not true at all", with the reliability of 0.86.

Data analysis

Two statistical approaches were used to test the hypotheses. Pearson's Product Moment Correlation Coefficient was used to examine the magnitude of the relationship between variables. Hierarchical multiple regression analysis was computed to test the incremental validity for the newly constructed measure. Beyond the statistically significant, the practical significant of at least 10.00% was set.

Results - Phase 2

Intercorrelation of the variables

Correlation coefficient between PMS and CSE was 0.604, $p<.01$, while between PMS and PsyCap was 0.399, $p<.01$ (Table 4). These results supported hypothesis 3.

Table 4: Intercorrelation coefficients among the variables (N =128)

	Variables	Mean	SD	1	2	3	4
1	Psycho-moral strength (PMS)	52.84	7.82	1			
2	Core self-evaluation (CSE)	51.77	7.50	.604**	1		
3	Psychological capital (Psy Cap)	56.52	6.49	.399**	.495**	1	
4	Academic behavior (AB)	57.48	7.48	.653**	.403**	.453**	1

Note: **p<.01.

Hierarchical regression analysis on academic behavior

Two steps hierarchical multiple regression analysis was employed to examine the predic-tive power of PMS scale on AB (Table 5). In the first step, it was found that CSE and PsyCap could predict AB with the R square of 0.248. In step 2, the finding revealed that PMS could significantly predict AB beyond the variables in step 1 with the R square change of 0.228 which yielded the total R square of 0.475. This result simplified that the PMS variable had predictive power of 22.80% more than those of the two predictors combined.

Table 5: Hierarchical MRA on academic behavior

Step		B	Beta	t	Sig.	Collinearity Statistics			
						Tolerance	VIF	R^2	R^2 Change
1	(Constant)	23.373	0.236	4.349	0.000				
	CSE	0.235	0.336	2.643	0.009	0.755	1.325		
	PsyCap	0.388		3.768	0.000	0.755	1.325	0.248	-
2	(Constant)	14.854		3.193	0.002				
	CSE	-0.09	-0.09	-1.035	0.303	0.558	1.791		
	PsyCap	0.295	0.256	3.384	0.001	0.739	1.353		
	PMS	0.579	0.606	7.341	0.000	0.622	1.609	0.475	0.228

Conclusion and Discussion

In the past two decades, many higher-order construct consisted of about two to four facets of single important construct have been introduced and validated. Some famous higher-order con-structs are, for example, psychological capital (Luthans & Youssef, 2004) and core self-evaluation (Judge, et al., 2003) which originally focused on organizational context. However, numerous stud-ies have revealed that these higher-order construct can be applied in other contexts, e.g., learning, moral, health, environment, and politics. In this study, a new higher-order construct, so called "Psycho-Moral Strength" was constructed. It consists of four facets, namely, 1) internal locus of control, 2) achievement motive, 3) future orientation and self-control, and 4) moral identity. This trait-like construct is considered as "psychological strength or force" that can direct, energize, and drive an individual to produce desired and sustainable behaviors. The concept and structure of the PMS was validated in the university lecturers and supported by the CFA.

The results in this study revealed three important findings. First, no significant or low sig-nificant correlation coefficients among the four facets were found (see Table 3). These findings indicated less multicollinearity between the facets which is one of important characteristics of higher-order indicators (Jarvis, Mackenzie, Podsakoff, 2003). It means that each facet seems more independent from each other which reflects different construct. But they can be combined into a new and broader construct. Second, the relationship between CSE and PMS was stronger than the relationship between PsyCap and PMS (see Table 4). It could be explained that the PMS and CSE were measured as trait-like constructs, while the PsyCap was more state-like construct. Further-more, the CSE and PMS measures both consisted of one of the four factors which were under the concept of internal locus of control. Third, hierarchical regression results revealed that PMS could significantly predict lecturers' academic behavior beyond CSE and PsyCap. Thus, it can be said that CSE and PsyCap could be the primary step constructs as "initiative resources" that passes through PMS which could plays as "psychological propulsion" to enhance work behavior of the Thai academicians.

Limitations and Implications

This is a self-report study. Many scholars pointed out about the possible disadvantages of this assessment (e.g., Brutus, Aguinis, & Wassmer, 2012; Luthans, et al., 2007). It can inflate the relationship between variables in the study. Thus, the validation in other samples or in other be-haviors to provide further confident evidence to justify this measure is needed. The scholars, re-searchers, and practitioners all around the world are welcome to modify or further develop this measure by several aspects. For example, the future measure based on the concept of "psychologi-cal strength" can be developed using similar stream of constructs as mentioned above. Moreover, to provide more accurate prediction, the future measure should be narrower and more specific to target variables (Ajzen & Fishbein, 1980) which means making the four facets more "state-like". A recent study of antecedents of COVID-19 preventive behavior (Punpromthada, Bhanthumnavin, Bhanthumnavin, Meekun, Sitsira-at, Pimthong, & Yaemyuen, 2022) followed this strategy and found supportive findings for the PMS.

This measure can shade lights for practical implications in psycho-behavioral science in new normal era. The result revealed that the PMS scale is important and necessary. The use of PMS scale together with other higher-order psychological constructs in future studies which can broaden and increase the understanding of relevant predictors of a wide range of behaviors. Using higher-order constructions in study, intervention, or assessment is more beneficial in terms of measuring many important facets (variables) in short version which is less time consuming, less cost-expense, but provide more data.

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