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**Author(s):** Cagas, Jonathan; Hassandra, Mary

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## The Basic Psychological Needs in Physical Education Scale in Filipino: An Exploratory Factor Analysis

Jonathan Cagas

*University of the Philippines Diliman*

Mary Hassandra

*University of Jyväskylä, Finland*

Fulfillment of students' basic psychological needs in school physical education is essential for their optimal motivation and well-being. The present study aimed to: (1) translate the Basic Psychological Needs in Physical Education Scale (BPNPE Scale; Vlachopoulos, Katarzi, & Kontou, 2011) to Filipino, and (2) examine the reliability and validity of the Filipino version. Instrument translation was conducted using a committee-approach back-translation procedure. The Filipino version was then administered to 408 public high school students from Metro Manila during one of their PE classes. Results showed that internal consistency reliabilities of the subscales were adequate with alphas ranging from .70 to .83. Construct validity was supported with  $r$  values ranging from .37 to .60 ( $p < .001$ ). Finally, exploratory factor analysis revealed a clear three-factor structure reflective of the three psychological needs (competence, autonomy, relatedness). In conclusion, findings provided preliminary support to the Filipino version of the BPNPE scale as a psychometrically-sound instrument for assessing needs fulfillment in PE among Filipino high school students. Nevertheless, further validation is recommended.

*Keywords:* basic needs fulfillment, motivation, physical education, self-determination theory, Filipino adolescents

Physical Education (PE) is an important setting where young people are taught about lifelong physical activities (Bocarro, Kanters, Casper, & Forrester, 2008) and it has the potential to provide children

and adolescents with opportunities to meet the recommended amount of health-enhancing physical activity (Trudeau & Sheppard, 2008). With physical inactivity among schoolchildren becoming a health concern worldwide (Guthold, Cowan, Autenrieth, Kann, & Riley, 2010), understanding how to enhance young people's motivation in PE is an important research area. Research suggests that students who are motivated in PE are most likely to feel motivated in becoming physically active during their leisure-time as well (Barkoukis, Hagger, Lambropoulos, & Tsorbatzoudis, 2010).

### **Basic Psychological Needs in Physical Education**

Self-determination theory (SDT; Ryan & Deci, 2002) proposes that there are three basic psychological needs which are essential rudiments for optimal motivation and well-being. These psychological needs are the need for competence (belief in one's ability to perform a certain task efficiently and effectively), relatedness (feeling of belongingness or being connected with others), and autonomy (perception of being the initiator and source of one's behavior) (Ryan & Deci, 2002). Fulfillment of these psychological needs can lead to cognitive, affective, and behavioral outcomes in PE (Ntoumanis & Standage, 2009). Failure to address these needs may lead to decreased motivation and experience of ill-being or boredom (Ryan & Deci, 2000).

One way in which these needs are fulfilled is when the PE teacher creates an autonomy-supportive learning environment, promotes self-development, and exhibits compassion and consideration towards the students (Bryan & Solmon, 2007). More specifically, needs fulfillment plays a mediating role in the relationship between perceived teacher autonomy-support and students' self-determined motivation (Barkoukis et al., 2010) and subjective vitality (Taylor & Lonsdale, 2010).

Numerous studies have examined the effects of needs fulfillment on students' motivation and other important outcomes in PE. For example, Barkoukis et al. (2010) tested the role of needs fulfillment in the formation of self-determined motivation in PE and leisure-time contexts. They found that needs fulfillment in PE does not only

have positive influence on students' motivation in this context, but also has positive effects on their motivation to engage in leisure-time physical activities. Moreover, they found that needs fulfillment in PE also influences students' intention to be active during their leisure time. Other important consequences of needs fulfillment in PE include positive attitudes towards PE as a subject (Moreno Murcia, González-CutreColl, & Ruiz Pérez, 2009), enhanced well-being (Vlachopoulos, Katarzi, & Kontou, 2011), development of autonomous motivation (Zhang, Solmon, Kosma, Carson, & Gu, 2011), and increased physical activity (Zhang et al., 2011).

### **Basic Psychological Needs are Universal**

One of the fundamental tenets of SDT is that the three basic psychological needs are universal across cultures, gender, and developmental stage. These basic needs are important for continued psychological growth, integrity, and well-being (Deci & Ryan, 2000). However, as SDT was originally developed in North America, there is always a question whether this particular framework is applicable in other cultures.

In order to examine SDT's universality hypotheses in the PE context, Taylor and Lonsdale (2010) compared the relationships among perceived autonomy support, needs fulfillment, and subjective vitality in individualistic (UK) and collectivistic (Hong Kong, China) cultures. They found that needs fulfillment mediates the relationship between autonomy support and vitality in both cultures. Their findings on the universality of psychological needs in collectivistic Asian cultures have also been supported in education (Jang, Reeve, Ryan, & Kim, 2009) and sports contexts (Ng, Lonsdale, & Hodge, 2011).

Recently, Church et al. (2013) provided initial support of SDT's universality in the Filipino culture. The results of their study provided further evidence that basic needs fulfillment is an important predictor of well-being regardless of culture. However, the authors only investigated basic needs fulfillment in life domain. Context-specific evidence is still needed to determine the usefulness of SDT framework in studying Filipino students' motivation in PE.

### **The Basic Psychological Needs in Physical Education Scale**

The Basic Psychological Needs in Physical Education Scale (BPNPE Scale; Vlachopoulos et al., 2011) is a short context-specific instrument designed to measure fulfillment of students' basic psychological needs in PE. It is anchored on SDT and has only been validated recently. Vlachopoulos et al. (2011) argued that there was a need for "a short, easy-to-administer, valid, reliable, and context-appropriate instrument" in order to facilitate longitudinal and experimental research in PE. Previous studies examining basic needs fulfillment only adapted instruments originally developed for other contexts (e.g., Barkoukis et al., 2010; Taylor & Lonsdale, 2010).

The BPNPE scale was originally written in Greek and had been validated among elementary school (11-12 years), middle school (13-15 years), and high school students (16-18 years) in Greece. In their validation study, Vlachopoulos and colleagues (2011) examined the factor structure, nomological validity, and measurement invariance of the BPNPE scale using confirmatory factor analysis and structural equations modeling methods. The results of their study showed that the instrument exhibited adequate three-factor structure and internal consistency reliabilities which allowed them to conclude that the BPNPE scale is a valid measure of students' psychological needs fulfillment in PE. The results also demonstrated that the three basic needs were positively correlated with perceived autonomy support and subjective well-being, providing support for nomological validity. However, the authors warned against using all items when conducting gender comparison because some items were found to be interpreted differently by middle school boys and girls.

After its publication in 2011, only one study (i.e., Vlachopoulos, 2012) using the BPNPE scale thus far has been published. Personal communication with the main author revealed that validation of the English translation is ongoing, and that the instrument has only been translated to German (Heckmann, 2013) and Filipino as of this writing. Further validation is necessary if the scale is to be used in other cultures.

## **The Present Study**

This present study aimed to: (1) translate the BPNPE scale to Filipino and (2) examine the reliability and validity of the Filipino translation. The translation and validation procedure suggested by Banville, Desrosiers, and Genet-Volet (2000) for cross-cultural studies in sports and exercise psychology was adapted. This procedure includes preparation of preliminary versions using the back-translation technique, committee-approach evaluation of preliminary versions and preparation of experimental version, pretest of experimental version, evaluation of content validity, evaluation of reliability, and evaluation of construct validity.

## **METHOD**

### **Participants**

Four hundred eight students (192 boys, 216 girls) from two public high schools in Metro Manila completed a two-page questionnaire assessing their perceived levels of needs fulfillment, autonomy support, and vitality. All four high school levels were adequately represented: 111 (27.2%) first year, 93 (22.8%) second year, 101 (24.8%) third year, and 103 (25.2%) fourth year students. Ages ranged from 11 to 19 years ( $M = 13.97$ ,  $SD = 1.38$ ).

Participants were also asked to indicate their primary spoken language. Three hundred seventeen mentioned only one primary language, 312 of which speaks Filipino (98.42%) and four speaks English (1.26%). This observation was expected as participants were from Metro Manila where Tagalog is the standard language of conversation (Paz, 1996). Filipino is mainly based on the Tagalog language (Paz, 1996), hence, in this study, both words were considered as one and the same. Seventy-three reported to speak at least two languages with 32 (43.84%) using English as medium of communication. Only eight reported speaking at least three languages.

## Measures

**Psychological Needs Fulfillment.** The Basic Psychological Needs in Physical Education Scale (BPNPE; Vlachopoulos et al., 2011) is a 12-item instrument composed of three subscales with four items each. The three subscales assess fulfillment of autonomy need (“*Pakiramdam ko ay ako ang pumili ng mga activities namin sa PE*”), competence need (“*Sa PE, sa tingin ko’y nagagawa ko nang mahusay kahit ang mga gawain na itinuturing na mahirap ng karamihan ng aking mga kaklase*”), and relatedness need (“*Sa PE, pakiramdam ko’y may malapit na pagsasamahan kami ng aking mga kaklase*”). Students responded to a 7-point Likert scale which ranged from 1 (*Hinding-hindi ako sumasang-ayon*) to 7 (*Lubos akong sumasang-ayon*).

**Additional Measures.** Two additional instruments were used in order to test the BPNPE scale’s construct validity. Construct validity is demonstrated when constructs correlated well with other theory-defined variables. The basic psychological needs act as mediators in the relationship between perceived autonomy and well-being, hence all these variables should be positively correlated (Ryan & Deci, 2000; 2002).

*Perceived Autonomy Support.* The Health Orientation Climate Questionnaire-short version (Williams, Grow, Freedman, Ryan, & Deci, 1996, as cited in Vlachopoloulos et al., 2011) was used to measure perceived autonomy support (PAS). As with previous studies (e.g., Vlachopoulos et al., 2011), wordings of statements were modified for PE context. Students responded to each item using a 7-point Likert type scale which ranged from 1 (*Hinding-hindi sumasang-ayon*) to 7 (*Lubos na sumasang-ayon*). An example statement is, “*Tinitingnan ng aking PE teacher kung naiintindihan ko nang mabuti ang gagawin sa klase bago siya nagmumungkahi ng bagong paraan upang gawin ang mga ito.*”

*Subjective Vitality.* The Subjective Vitality Scale is a 7-item instrument used as a proxy measure of well-being (Ryan & Frederick, 1997, as cited in Vlachopoloulos et al., 2011). As with previous researches (Vlachopoloulos et al., 2011; Vlachopoloulos, 2012), Item 2 was not included in computing the composite score for vitality to

improve the scale's internal reliability. An example statement is, "*Sa PE, mayroon akong lakas at sigla.*" Responses ranged from 1 (*Hindi totoo*) to 7 (*Totoong-totoo*).

### **Procedure**

**Translation.** Eight Filipino-English bilinguals from various Philippine universities were invited and agreed to be part of the translation committee. They were selected for their expertise in PE, social psychology, and research and evaluation. Half of them were asked to forward-translate the English version of the instruments to conversational Filipino, a language form comprising of informal Filipino terms and borrowed English words which had been used in previous Filipino instrument translation studies (e.g., Ganotice & Bernardo, 2010), while the other half performed back-translation. The procedure was coordinated by the first author via email and was completed in a span of three months.

**Data Collection.** Permit to collect data from public schools was obtained from the Department of Education City Division Office, and subsequently from principals of the selected public schools. Data were collected on a day when students had PE class. The study objectives were first explained to the students before the questionnaires were distributed. Students were informed that participation was voluntary and those who chose to participate were instructed to answer each item honestly. Students who decided not to participate were requested to return the questionnaires unmarked. To decrease social desirability, participants were told that their answers would not affect their grades, remain confidential, and be accessible only to the researchers. The PE teachers were also requested to leave the room for the entire duration of data collection. Students took an average of 20 minutes to complete the questionnaire.

### **Data Analysis**

Preliminary data screening was performed to check for missing data and outliers (See Tabachnick & Fidell, 2007, pp. 60-166). All items exhibited univariate normality with skewness and kurtosis values

$\leq 2.0$ . Normal Q-Q plots were also visually examined for outliers. Seventeen cases (4.2%) with Mahalanobis distance values greater than  $\chi^2(12) = 32.91, p = 0.001$  were identified as multivariate outliers. These outliers were removed reducing the sample size to 391.

Inter-item correlation, item-total statistics, and Cronbach's alpha coefficients were examined for item and internal consistency reliability analyses. For test-retest reliability, intraclass coefficients (ICC) were calculated. For construct validity, Pearson correlation analyses were performed to examine relationships among these SDT variables. Values of Cronbach's alpha, ICC, and Pearson  $r$  should be .70 or above in order to be considered adequate (Tabachnick & Fidell, 2007).

For main analysis, assumptions for factor analysis were examined before results were interpreted. First, item correlation matrix of the 12 BPNPE items was examined to determine factorability of data. Factorability is fulfilled when each item is correlated with at least one other item by .30 (Tabachnick & Fidell, 2007). Second, minimum sample size required for factor analysis was tested using Kaiser-Meyer-Olkin (KMO) criteria of  $\geq .60$  and case per item ratio of 5:1 (Tabachnick & Fidell, 2007). KMO values of individual items were also examined from diagonals of the anti-image correlation matrix and should be at least .50. Bartlett's test of sphericity had to be significant ( $p < .05$ ) to support appropriateness of factor analysis. Finally, communalities need to be above .30 to indicate that each item shared a common variance with the other items. Item-total correlation coefficients of all items should be at least .30.

Several exploratory methods were then conducted to examine the factor structure of the Filipino BPNPE scale. The final decision was to use principal axis factoring (PAF) with direct oblimin rotation in reporting the scale's factor structure for theoretical and practical reasons. Kaiser criterion, Scree test, and Monte Carlo parallel analysis were also used to assist in determining the number of factors to be retained (Tabachnick & Fidell, 2007).

## RESULTS

### Translation

The questionnaire was translated and back-translated several times until a culturally suitable version comparable in meaning to the original version was produced. This version was then administered to a small group of first year high school students ( $n = 10$ ) for pretesting. Students were interviewed informally and were asked if the statements were clear and understandable. They were also requested to identify vague words and to suggest terms more commonly used in day-to-day language. Minor revisions were made according to students' feedback and upon consultation with committee members. A Filipino social psychology expert was consulted for content validation.

### Item Analysis and Internal Consistency Reliability

Item analysis on the 12 BPNPE items was conducted by examining inter-item correlations, item-total statistics, and internal consistency reliability. Results revealed adequate inter-item correlations with an average of .40 and values ranging from .20 to .66. All 12 items also had acceptable item-total correlations with  $r$  values ranging from .51 to .70 (see Table 1). Overall internal consistency reliability was acceptable with Cronbach's alpha value of .88. Individually, each subscale also had acceptable internal consistency reliabilities with alpha value of .70 for autonomy need (AUT), .83 for competence need (COM), and .76 for relatedness need (REL).

The two additional scales also had acceptable internal consistency reliabilities. Cronbach's alpha of perceived autonomy support was .76, while that of subjective vitality was .88. Composite scores for the three basic needs fulfillment (AUT, COM, REL), perceived autonomy support (PAS), and subjective vitality (VIT) were then computed and used to determine test-retest reliability and construct validity.

### Test-Retest Reliability

A small number of first year students ( $n = 47$ ) answered the

Table 1. Item Descriptives, Skewness, Kurtosis, and Item-Total Correlation

Item	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	Item-Total Correlation
Autonomy 1	5.24	1.63	-.85	.01	.51
Autonomy 2	4.38	1.86	-.41	-.86	.52
Autonomy 3	5.14	1.54	-.75	-.08	.63
Autonomy 4	3.80	2.02	.04	-1.18	.49
Competence 1	4.96	1.72	-.66	-.38	.52
Competence 2	5.18	1.49	-.77	.01	.63
Competence 3	5.05	1.57	-.79	.07	.65
Competence 4	5.22	1.55	-.70	-.24	.60
Relatedness 1	5.92	1.32	-1.29	1.22	.51
Relatedness 2	5.67	1.46	-1.21	1.07	.54
Relatedness 3	5.00	1.75	-.71	-.38	.60
Relatedness 4	4.97	1.91	-.76	-.56	.56

questionnaire again after one week. Test-retest scores of AUT need were moderately correlated,  $r = .46$ , with an ICC value of .44. Mean scores between tests increased from 4.20 ( $SD = 1.50$ ) to 4.73 ( $SD = 1.15$ ),  $F(46, 46) = 2.59$ ,  $p = 0.001$ . COM need test-retest scores were also moderately correlated,  $r = .47$ , and had an ICC value of .46. Mean scores changed significantly from 4.74 ( $SD = 1.61$ ) to 4.92 ( $SD = 1.31$ ),  $F(46, 46) = 2.67$ ,  $p = .000$ . Lastly, REL need scores were moderately correlated,  $r = .49$ , and had an ICC value of .47. Mean scores between two testing increased from 4.86 ( $SD = 1.49$ ) to 5.35 ( $SD = 1.17$ ),  $F(46, 46) = 2.79$ ,  $p = .000$ .

### Construct Validity

Bivariate Pearson correlation analyses were conducted to examine the relationships among AUT, COM, REL, PAS, and VIT. Inter-correlations among the BPNPE subscales were moderate (.53 to

.60). All three needs were also significantly correlated with PAS and VIT (see Table 2).

### **Factor Structure**

Assumptions required for factor analysis were satisfied. First, item correlation matrix showed that all 12 BPNPE items were correlated with at least one other item by .30, indicating factorability. Second, minimum sample size required for factor analysis was fulfilled based on KMO value of .90, and case per item ratio (i.e., 32 cases/item). KMO values of individual items from diagonals of the anti-image correlation matrix ranged from .83 to .91, which were above the minimum acceptable value of .50. Correlations between items were also adequate as indicated by Bartlett's test of sphericity,  $\chi^2(66) = 1925.74, p = 0.000$ . Finally, communalities were above .30, and item-total correlation coefficients of all items were also acceptable (.49-.65).

Principal axis factoring (PAF) extracted three factors with eigenvalues greater than 1.0. Together, these three factors accounted for 63.33% of total variance. Factor 1 accounted for 45.04% of total variance and consisted off our original COM items. Factor 2 accounted for 9.66% of total variance and is composed of five items, four of which were original REL items and one AUT item. Lastly, Factor 3 accounted for 8.63% of the total variance and is comprised of two AUT items. After extraction, Factor 1 accounted for 41.16% of variance while Factors 2 and 3 accounted for 6.30% and 4.59%, respectively. These factors were subsequently named as Competence, Relatedness, and Autonomy Needs Fulfillment. One item, however, did not load on any factor as only items with loading values of .40 were interpreted. Scree test and Monte Carlo parallel analysis (see Table 3) also provided additional support for retaining the three factors.

Factor correlation matrix indicated that correlations among the resulting factors were moderate and above the accepted criterion of  $r = .32$  (Tabachnick & Fidell, 2007). Table 4 shows the item's factor loadings and communalities.

Table 2. Summary of Intercorrelations, Means, and Standard Deviations for Autonomy Needs, Competence Needs, Relatedness Needs, Perceived Autonomy Support, and Vitality

	M	SD	$\alpha$	1	2	3	4	5
AUT	4.64	1.28	.70	-	.57***	.60***	.47***	.37***
COM	5.10	1.28	.83		-	.53***	.37***	.36***
REL	5.40	1.23	.76			-	.47***	.41***
PAS	5.63	0.98	.76				-	.40***
VIT	5.69	1.04	.88					-

\*\*\* Correlation is significant at the 0.001 level (2-tailed)

Table 3. Comparison of Eigenvalues From PAF and Criterion Values From Monte Carlo Parallel Analysis

Factor Number	Actual eigenvalue from PAF	Criterion value from parallel analysis	Decision
1	5.40	1.29	Accept
2	1.16	1.22	Reject (with caution)
3	1.04	1.16	Reject (with caution)
4	0.82	1.11	Reject
5	0.57	1.06	Reject
6	0.57	1.01	Reject
7	0.52	0.97	Reject
8	0.49	0.93	Reject
9	0.44	0.89	Reject
10	0.39	0.85	Reject
11	0.32	0.79	Reject
12	0.28	0.74	Reject

Table 4. Factor Loadings and Communalities of PAF With Oblimin Rotation

Items	Competence	Relatedness	Autonomy	$h^2$
Item 3. Sa PE, ginagawa namin ang mga bagay na interesado ako.				.356
Item 6. Sa tingin ko ay itinuturo ang PE sa paraan na gusto ko.			.491	.403
Item 9. Sa PE, pakiramdam ko na ang mga klase ay tunay na nagpapahayag ng pagkatao ko.		.406		.473
Item 12. Pakiramdam ko ay ako ang pumili ng mga activities namin sa PE.			.795	.680
Item 1. Sa PE, sa tingin ko ay nagiging mas mahusay ako kahit sa mga gawain na itinuturing na mahirap ng karamihan ng aking mga kaklase.	.716			.478
Item 4. Sa PE, sa tingin ko ay nagagawa ko nang tama kahit ang mga gawain na itinuturing na mahirap ng karamihan ng aking mga kaklase.	.742			.625
Item 7. Sa PE, sa tingin ko'y nagagawa ko nang mahusay kahit ang mga gawain na itinuturing na mahirap ng karamihan ng aking mga kaklase.	.814			.713
Item 10. Sa PE, napagtatagumpayan ko ang mga gawain kahit na nahihirapan dito ang karamihan.	.639			.523
Item 2. Sa PE, maayos ang pakikitungo ko sa aking mga kaklase.		.488		.388
Item 5. Sa PE, pakiramdam ko'y may malapit na pagsasamahan kami ng aking mga kaklase.		.405		.410
Item 8. Sa PE, pakiramdam ko ay isa akong mahalagang miyembrong isang barkada.		.756		.606
Item 11. Sa PE, sa tingin ko ay nabibilang ako sa isang malaking barkada.		.755		.591

Note. Factor loadings <.40 are suppressed.

## DISCUSSION

The aims of this study were to translate a scale designed to measure students' psychological needs fulfillment in physical education context to Filipinos and to examine its reliability, validity, and factor structure. The use of a committee-approach procedure ensured that translated statements were true in meaning to the original and not merely word-by-word translation and prevented single-translator bias (Banville et al., 2000). As a result, an adequate translation was produced.

### Reliability

Results showed that inter-item correlations and item-total correlations were sufficient. Cronbach's alpha coefficients of the three BPNPE subscales were above the acceptable level of .70. Reliability coefficient of competence need subscale in the present study is comparable to previous studies (Vlachopoulos, 2012; Vlachopoulos et al., 2011) while autonomy and relatedness needs, .70 and .76, respectively, were relatively lower. Nevertheless, results demonstrated that the Filipino BPNPE scale has good internal consistency reliabilities indicating that the items within each subscale measure the same constructs.

Intraclass correlation coefficient (ICC), similar to the one used in previous studies (Ng et al., 2011; Vlachopoulos & Michailidou, 2006), was used to determine test-retest reliability over a one-week period. Such short time interval should not change students' perceptions of needs fulfillment significantly (Ng et al., 2011). Results indicated that the BPNPE subscales have moderate stability with ICC values ranging from .44 to .47. However, all ICC values were below the acceptable level of .70, indicating inadequate test-retest reliability. Mean scores of all three subscales also changed significantly over the one-week interval. Mean scores in the second measurement were higher compared to the first measurement suggesting some possible intervening factors such as researcher error, environmental changes, participant changes, and carry-over effect (Kaplan & Saccuzzo, 2005). Nevertheless, the exercise version from which the BPNPE scale was derived had high test-retest reliability over a four-week time interval (Vlachopoulos &

Michailidou, 2006). Future studies should re-examine the test-retest reliability of the Filipino BPNPE scale using another sample and over a longer time interval.

### **Construct Validity**

Construct validity of the Filipino scale was established by examining the relationships between the three subscales with perceived autonomy support and subjective vitality. Based on SDT (Ryan & Deci, 2002), these constructs are positively correlated. In this study, each need fulfillment subscale was significantly correlated with both perceived autonomy support and subjective vitality providing preliminary evidence of construct validity. The strengths of each relationship were also consistent with previous studies (Vlachopoulos, 2012; Vlachopoulos et al., 2011). Future studies should test whether the three basic needs mediate the relationship between perceived autonomy support and vitality as suggested in SDT (Deci & Ryan, 2000; Ryan & Deci, 2002) to provide further evidence of theoretical applicability in Filipino culture.

### **Factor Structure of the Filipino BPNPE Scale**

Results of exploratory factor analysis revealed a clear three factor-structure similar to Vlachopoulos et al.'s (2011). However, one autonomy item did not load on its intended factor while another one had inadequate factor loading. Autonomy Item 3 (*Pakiramdam ko na ang mga klase ay tunay na nagpapahayag ng pagkatao ko.*) loaded strongly ( $r = .51$ ) on Relatedness, while Autonomy Item 1 (*Ginagawa namin ang mga bagay na interesado ako.*) failed to load on any of the resulting factors.

Moreover, only two of four autonomy items were valid in this sample. Additional items could be developed to enhance this subscale's reliability as factors which consist only of two items are considered "weak and unstable" (Costello & Osborne, 2005). The autonomy factor had been problematic even in earlier studies and it was recommended that future research should take into consideration how autonomy is understood and defined in the target culture (Ntoumanis, Barkoukis,

& Thørgersen-Ntoumani, 2009). Qualitative studies should provide important information on how autonomy items should be written to enhance the reliability of this factor. Researchers had also mentioned that it might be strategic to involve students in item development (Standage, Gillison, & Treasure, 2007).

Bernardo, Zhang, and Callueng (2002) suggested that cultural concepts may be explored in order to understand the results of exploratory studies such as this one. *Kapwa* or shared identity, a core value in the Filipino culture wherein the ego (*ako*) and others (*iba sa akin*) are perceived as one (Enriquez, 1992), can be a possible explanation as to why Autonomy Item 3 loaded on Relatedness. The statement “A true expression of who I am” was translated to “*Tunay na nagpapahayag ng pagkatao ko*” which literally means “a true expression of my personhood.” It may be possible that Filipino students perceived their personhood (*pagkatao*) as not different from others (*hindi iba sa kapwa*) resulting to Autonomy Item 3 loading on Relatedness factor. It could also be possible that “*nagpapahayag*” was interpreted to be about social communication and thus may not be the best translation of the word “*expression*.”

### **Limitations**

The study has several limitations. One is that the sample consisted of students from two public high schools only. Although students’ characteristics in these schools may be considered representative of those studying in Metro Manila public high schools, the findings cannot be generalized outside the study sample. Future research should employ a stratified random sampling of both public and private Philippine high schools to enhance the scale’s external validity.

Another limitation is the use of EFA. Although EFA was able to identify a clear three-factor structure similar to the original version within the Filipino version, it does not yet establish SDT’s validity in Filipino culture. A confirmatory factor analysis is required to accomplish this. Nevertheless, the use of EFA was able to detect possible cultural nuance of the item which loaded on Relatedness.

### **Implications for Practice**

While these results are preliminary, evidence suggests that SDT may be a useful framework in understanding Filipino students' motivation in PE. Results suggest that addressing students' basic psychological needs in PE has positive effects on their well-being. In addition, when students perceive their PE teachers to be autonomy supportive, they experience higher needs fulfillment.

Bryan and Solmon (2007) enumerated several strategies on how PE teachers can satisfy students' psychological needs: First, PE teachers can focus on self-improvement, place less emphasis on competition, and provide feedback as well as challenging tasks to satisfy students' competence need. Second, teachers can convey warmth and care towards the students, be more considerate and compassionate, and also be more respectful of the students' feelings and experiences in class to fulfill relatedness need. Finally, teachers can provide students with opportunities to choose activities in class, avoid controlling behaviors, and minimize pressure in order to support autonomy need.

PE teachers and researchers may also use the Filipino BPNPE scale in assessing intervention programs aiming to bring motivational changes in PE students. The instrument can be used as an additional evaluation index to determine if intervention programs are successful in fulfilling their psychological needs. Future studies may also examine the effects of needs fulfillment on other important PE-related outcomes such as intention to be physically active, enjoyment, and actual physical activity behavior (Ntoumanis & Standage, 2009).

### **Conclusion**

In conclusion, this study provides initial support for reliability and validity of the Filipino BPNPE scale. Acceptable levels of internal consistency reliabilities and construct validity were demonstrated. Short-term test-retest reliability, however, needs to be re-examined in future studies. Finally, a three-factor model reflective of the three basic psychological needs was identified providing initial support for the scale's factorial validity. Overall, findings suggest that the Filipino BPNPE scale is a psychometrically sound measure of basic needs

fulfillment in PE among Filipino high school students. Nevertheless, further refinement of the scale is recommended.

### AUTHORS NOTES

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