

THE BASIC PSYCHOLOGICAL NEEDS IN PHYSICAL EDUCATION

SCALE IN FILIPINO

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ABSTRACT

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The Basic Psychological Needs in Physical Education Scale (BPNPE Scale: Vlachopoulos, Katarzi, & Kontou, 2011) is a short instrument grounded in Self-Determination Theory (Ryan & Deci, 2000; 2002), designed to measure fulfillment of students' basic needs for competence, autonomy, and relatedness in physical education context. The Greek version of this instrument has been reported to have adequate factor structure and strong internal reliability. Instruments developed in other culture need to be examined using a sample from the target culture in order to establish its cultural utility.

The primary aim of this study was to explore the factor structure, construct validity, and reliability of the Filipino BPNPE Scale. The secondary purpose was to test whether after-school sports participation is associated with students' experience of needs fulfillment, autonomy support, and subjective vitality in physical education. The instrument was first translated to conversational Filipino via committee-approach back-translation procedure. Four hundred and eight ($N = 408$) Filipino high school students completed a two-page questionnaire assessing their needs fulfillment in physical education, as well as perceived teacher-autonomy support, and subjective vitality.

Principal axis factoring with direct oblimin rotation extracted a simple three-factor structure explaining 61.38% of the total variance. Individually, factor 1 accounted for 42.45% of the total variance, while the remaining two provided an additional 10.5% and 8.43%, respectively. These correlated factors (Range: .51 - .63) were consequently labeled as Relatedness need (4 items; $\alpha = .76$), Competence need (4 items; $\alpha = .83$), and Autonomy need fulfillment (2 items; $\alpha = .64$). These three factors were significantly correlated with autonomy support and subjective vitality (Range: .37 - .47) supporting construct validity. However, test-retest reliability was weak and inadequate.

Additional analyses indicated that after-school sports participation had a significant effect on students' experience of subjective vitality in physical education. More specifically, girls who participated in after-school sports experienced higher subjective vitality in physical education compared to their peers.

In summary, findings of this study provide preliminary support to the Filipino BPNPE Scale as a valid tool to assess basic psychological needs in physical education among Filipino high school students. Nevertheless, further scale revision and item refinement is necessary. The contribution of after-school sports participation to students' experiences in PE is also highlighted.

Keywords: basic needs satisfaction, motivation, physical education, basic needs theory, autonomy, competence, relatedness, adolescents, Filipino

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TABLE OF CONTENTS

ABSTRACT

ACKNOWLEDGEMENT

1 INTRODUCTION.....	6
2 LITERATURE REVIEW	8
2.1 Self-Determination Theory.....	8
2.2 Basic Needs Satisfaction, Perceived Support, and Well-being	10
2.3 Cross-Cultural Validity of the Basic Psychological Needs Theory	11
2.4 Translation, Validation, and Adaptation of Research Instruments.....	11
2.5 Language in the Philippines	13
2.6 Sport and Exercise Psychology Research in the Philippines.....	13
2.7 The Basic Psychological Needs in Physical Education Scale	14
2.8. After-School Sports Participation.....	15
2.9 Summary of Literature Review	15
3 PURPOSE OF THE STUDY	17
4 METHODS.....	18
4.1 Research Design	18
4.2 Participants	18
4.3 Measures.....	20
4.3.1. Basic Psychological Needs.....	20
4.3.2. Perceived Autonomy Support.....	20
4.3.3. Subjective Vitality	20
4.4 Procedure	21

4.4.1. Translation and Back-Translation	21
4.4.2. Pilot Test.....	21
4.4.3. Procedure	22
4.5 Data Analysis.....	22
5 RESULTS.....	24
5.1 Preliminary Data Screening and Internal Consistency	24
5.2 Test-Retest Reliability	26
5.3 Construct Validity	26
5.4 Factor Analysis.....	27
5.5 Differences in Perceived Autonomy Support, Basic Needs, and Vitality	31
6 DISCUSSION.....	34
6.1 Basic Psychological Needs Fulfillment in Physical Education	34
6.2 Does the Filipino BPNPE Scale demonstrate adequate test-retest reliability?.....	35
6.3 Does the BPNPE Scale have acceptable construct validity?.....	35
6.4 Does the Filipino BPNPE Scale reflect a three-factor structure?.....	36
6.5 Differences in Perceived Autonomy Support, Basic Needs, and Vitality	37
6.6 Limitations, Recommendations for Future Research, and Implications for Practice	38
6.7 Conclusion.....	39
7 REFERENCES	40

APPENDICES

1 INTRODUCTION

School physical education (PE) plays a significant role in the teaching and promotion of lifelong physical activity and other health-related behaviors to children and adolescents (Biddle & Mutrie, 2008; Pate, Davis, Robinson, Stone, McKenzie, & Young, 2006; Tappe & Burgeson, 2004). School PE has been reported to influence physical activity in adulthood (Cleland, Dwyer, & Venn, 2011), and it can serve as an effective intervention against physical inactivity later in life (Azevedo, Araujo, da Silva, & Hallal, 2007). More specifically, school-based physical activities such as participation in physical education, free-time physical activities, and school sport, positively influence concentration, memory, classroom behavior, and intellectual performance in addition to providing young people opportunities in meeting current physical activity guidelines (Trudeau & Sheppard, 2008).

Physical inactivity is a global health issue (Dumith, Hallal, Reis, & Kohl III, 2011; Guthold, Cowan, Autenrieth, Kann, & Riley, 2010). While the many health benefits of physical activity in children and young adults have been well-documented (Strong et al., 2005), modern lifestyle changes had influenced young people to be less physically active and engage in more sedentary behaviors. In 2010, the World Health Organization released a global recommendation stressing the importance of physical activity for health. Physical activity and sedentary behaviors, such as television viewing, are also associated with obesity in young people (Janssen et al., 2005).

Lack of physical activity appears to be a major health issue not only in highly-developed countries but also in less developed or developing countries (Guthold et al., 2010). In the Philippines particularly, most Filipino schoolchildren do not reach the minimum recommendations for health-enhancing physical activity (Guthold et al., 2010; Gonzales-Suarez & Grimmer-Sommers, 2009). Filipino school children engaged in limited leisure-time physical activity with daily chores and active commuting provided most of their physical activities (Tudor-Locke, Ainsworth, Adair, & Popkin, 2003). School PE is a strategic avenue to teach and promote active living among young people because they spend considerable amount of their time in this environment (Bocarro, Kanters, Casper, & Forrester, 2008). However, some students may perceive PE as controlling because of its

mandatory nature. It is therefore important to understand how motivation is facilitated or hindered in this setting. At present, one of the most utilized approaches in the study of motivation in physical activity context and a useful theoretical framework to guide studies of physical activity behavior in children and young adults (Motl, 2007) is the Self-Determination Theory (SDT: Deci & Ryan, 1985, 2000).

Based on the Basic Psychological Needs Theory (Ryan & Deci, 2000), a component of the larger Self Determination framework, this study explored the structure of an instrument designed to measure basic needs fulfillment in the context of physical education. The original version consists of three subscales with four items each. The subscales represent the basic psychological needs for competence, relatedness, and autonomy, which are said to be innate and universal to all human beings.

2 LITERATURE REVIEW

This section provides a description of the Self Determination Theory as a framework for studying motivation. Relevant studies and literature were reviewed to provide rationale for the current study. The topics in this section includes: an introduction to SDT and its sub-theories particularly the Basic Psychological Needs Theory (BPNT); cross-cultural evidence of BPNT; instrument translation and validation procedures; the Filipino language and sports and exercise psychology research in the Philippines; after-school sport participation; and lastly, the Basic Psychological Needs in Physical Education Scale of Vlachopoulos and colleagues (2011).

2.1 Self-Determination Theory

Self-Determination Theory views motivation beyond the traditional dichotomy of intrinsic and extrinsic perspective and maintains that motivation is a continuum varying in the degree of self-determination, or the individual's perception of the amount of control he has over his actions (Deci & Ryan, 2000, 2008; Ryan & Deci, 2000). This theory explains that social environment facilitates the development of self-regulated motivation through the satisfaction of basic psychological needs, and that the development of self-regulated types of motivation results to behavioral, affective, and cognitive outcomes (Deci & Ryan, 2008). Vallerand (2000) summarized these motivational sequence as follows: Social factors (e.g., climate created by the PE teacher or coach) influences motivation (i.e., intrinsic, extrinsic with varying degrees of self-determination, amotivation) through the satisfaction of the basic psychological needs, which then results to affective, cognitive, or behavioral consequences. SDT has been applied in diverse physical activity contexts including exercise (e.g., Wilson, Mack, & Grattan, 2008), sports (e.g., Adie, Duda, & Ntoumanis, 2008; Almagro, Sáenz-López, & Moreno, 2010), and physical education (e.g., Hein & Koka, 2007; Standage, Gillison, & Treasure, 2007).

Within this macro-theory of motivation are four mini-theories which focus on different constructs (Deci & Ryan, 1985, 2000; Ryan & Deci, 2000, 2002). These sub-theories include: (1) Cognitive Evaluation Theory, which focuses on the effects of perceived locus of causality and perceived competence on intrinsic motivation; (2) Organismic Integration Theory, which defines the various forms of extrinsic motivation and amotivation; (3)

Causality Orientations Theory, which describes the individual's personality orientation towards being autonomous, controlled, or impersonal; and (4) Basic Psychological Needs Theory (BPNT). The primary premise of the BPNT is that individuals have innate psychological needs that have to be supported in order to experience positive well-being.

Ryan & Deci (2000, p.74) defined needs as "...an energizing state that, if satisfied, conduces into health and well-being but, if not satisfied, contributes to pathology and ill-being." These three basic psychological needs are the need for competence, autonomy, and relatedness. Autonomy means that the individual is the initiator and source of his behavior. Competence pertains to the belief in one's ability to perform certain task efficiently and effectively. Lastly, relatedness refers to the feeling of belongingness or being connected with others. SDT posits that these basic needs are important in understanding human motivation (Ryan & Deci, 2000). When these basic needs are fulfilled, development of self-motivation, positive social functioning, and personal well-being occur (Deci & Ryan, 2008). In contrast, when these basic needs are not supported or thwarted, motivation decreases and positive consequences are not facilitated (Deci & Ryan, 2008). These basic needs are fulfilled when the social agent (e.g., physical education teacher) provides an autonomy-supportive environment, promotes self-development, and exhibits compassion and consideration towards the students (Bryan & Solmon, 2007).

The social agent provides the environment which promote fulfillment of these three basic needs. When these needs are satisfied, it leads to higher levels of self-determination which then results to cognitive, behavioral, and affective outcomes. In physical education, for example, making the students feel their basic needs are being supported (i.e., when they feel that they are competent; that they have choices and voice in class; and, that they belong to a group) enhances their motivation to engage in class activities and feelings of well-being. In addition, students will feel that their basic needs are being addressed if they perceive autonomy support from a social agent who is, in this context, the PE teacher. One assumption of BPNT is that every individual shares these basic psychological needs regardless of age, gender, or culture. However, SDT was originally developed in North

America. Examining the validity of the BPNT across different culture is therefore necessary to confirm the universality of the basic psychological needs.

2.2 Basic Needs Satisfaction, Perceived Support, and Well-being

The relationship between basic needs satisfaction and well-being in several life domains is well-supported (Milyavskaya, Gingras, Mageau, Koestner, Gagnon, Fang, & Boiché, 2009; Milyavskaya & Koestner, 2011). For example, Milyavskaya and Koestner (2011) tested the proposed relationship between basic need satisfaction, motivation, and well-being in multiple life domains such as school, work, relationships, and sports. Results supported the hypothesis that basic needs satisfaction facilitates the experience of positive well-being. The study provided evidence for SDT's universality across different life domains.

In the domain of physical activity, substantial evidence is emerging in support of the relationship between basic needs satisfaction and well-being (Mouratidis, Vansteenkiste, Sideridis, & Lens, 2008; Taylor & Lonsdale, 2010; Vlachopoulos & Karavani, 2009). One study (Vlachopoulos & Karavani, 2009), for example, examined the role of basic needs satisfaction in the relationship between autonomy support and subjective well-being in an exercise context. It was found that the three basic needs of autonomy, competence, and relatedness, play a mediating role in this relationship. In addition, the results also provided evidence for the universality of basic needs across genders. The authors stressed the need to examine proposed SDT mechanisms and the universality of the basic needs hypotheses in different cultures. Satisfaction of these three basic needs was also found to influence students' attitude towards PE (Moreno Murcia, González-CutreColl, & Ruiz Pérez, 2009).

Perceived teacher support influences the development of perceived competence, autonomy, and relatedness in physical education (Cox & Williams, 2008). When physical education teachers provide students with choice and options in class, students develop more autonomous type of motivation through the satisfaction of the students' basic psychological needs. Recently, Barkoukis, Hagger, Lambropoulos, & Tsorbatzoudis (2010) provided evidence for this sequential relationship. They tested how the basic psychological needs are related to perceived autonomy support, and autonomous motivation in physical education and in leisure-time physical activity. Secondary school students in Greece completed a set of questionnaires measuring perceived autonomy

support, autonomous motivation, and basic psychological needs satisfaction in physical education. Findings supported the study hypotheses that needs satisfaction influences autonomous motivation in physical education and acts as a mediator in the relationship between perceived autonomy support and autonomous motivation. Nurturing student's motivation in physical education through an autonomy supportive environment, in effect, influences students' motivation towards after-school physical activity (Hagger, Chatzisarantis, Hein, Soos, Karsai, Lintunen, & Leemans, 2009). This is important in the fulfillment of physical education's role in promoting healthy physical activity behavior among young people.

2.3 Cross-Cultural Validity of the Basic Psychological Needs Theory

In order to explore the universality of the basic needs hypotheses across different cultures, Taylor & Lonsdale (2010) gathered multilevel data from physical education students in the U.K. and Hong Kong, China. Results of this study supported the mediating role of psychological needs satisfaction between perceived autonomy support and well-being. More specifically, the authors reported that the perception of teacher's autonomy support had a stronger influence on Chinese students' perceived competence. The authors explained that autonomy supportive teacher behaviours appear to be an important strategy in enhancing competence needs satisfaction especially in Chinese students. They argued that because Chinese culture is influenced by Confucian ideologies wherein students show respect to their elders or people in authority, the behavior of the teacher may have more influence "in Chinese classes than in UK education context."

Addressing the basic psychological needs of PE students encourages more self-determined motivation which does not result to positive experiences but also propel the students to allot more importance to the subject of physical education (Moreno Murcia et al., 2009). When a seemingly uninteresting activity such as mandatory physical education is valued, it fosters internalization and self-regulation which then lead to the development of more autonomous forms of motivation.

2.4 Translation, Validation, and Adaptation of Research Instruments

Translating an instrument from one language to another is not simple because it does not entail literally translating words to the target language. Van de Vijver and Leung (1997)

discussed three ways to enhance validity of instrument translation studies – application, adaptation, and assembly. Application means the direct and literal translation of a research instrument to the target language. Adaptation means literal translation but with word or content modification to enhance appropriateness of items in the target culture. Assembly means developing a new instrument that captures the same construct in the target culture.

Two approaches to translation and adaptation were also discussed. The two procedures are translation-back translation and bilingual committee approach. In the first method, an interpreter translates the instrument to the target language and another interpreter back translates the translated instrument to the source language. It can be problematic because it produces literal translations and may lose the ‘naturalness’ and readability of the texts. The authors discussed ‘cultural decentering’ as a solution to this problem. Cultural decentering means removing words and concepts in the source instruments that are difficult to translate to the target culture. The second procedure to translation and adaptation is the bilingual committee approach. In this method, a committee of bilinguals works on the process. It also requires that members are experts in the field. Although time-consuming, the major strength of this technique is the cooperative effort among the members of the translation committee.

Banville, Desrosiers, and Genet-Volet (2000) discussed an emic-etic approach in translating and validating research instruments. This approach includes seven steps as developed by Vallerand in 1989 for psychological researches. The first 3 steps involve the translation process and the last 4 steps concern the validation procedure. In brief, these steps are: (1) Preparation of preliminary versions using the back translation technique; (2) Evaluation of preliminary versions and preparation of experimental version using the committee approach; (3) Pretest of experimental version using random survey; (4) Evaluation of the concurrent and content validity; (5) Evaluation of the reliability; (6) Evaluation of the construct validity; (7) Establishing norms. This translation and validation procedure has been used in many sports and exercise psychology studies (e.g., Dominguez, Martin, Martin-Albo, Nuñez, & Leon, 2010; Wang, Hagger, & Liu, 2009; Vlachopoulos, Ntoumanis, & Smith, 2010).

2.5 Language in the Philippines

Filipino and English are the two official languages in the Philippines and is the accepted medium of educational instruction. A recent curricular change, however, will introduce the Mother Tongue-Based Multi-Lingual Education (MTB-MLE) (David, 2012 March 15). This approach is part of the reformed K+12 basic education programme and allows the teaching of any of the twelve major Philippine languages as a subject, as well as the use of the local language as medium of instruction. The twelve major languages in the Philippines are Tagalog, Kapampangan, Pangasinense, Iloko, Bikol, Cebuano, Hiligaynon, Waray, Tausug, Maguindanaoan, Maranao, and Chabacano. The regional mother language will be used to teach all subject areas except Filipino and English from kindergarten to Grade 3. Filipino and English will be taught in Grade 1. The school year in the Philippines starts in June and ends in March.

Conversational Filipino is commonly used by students in Metro Manila and this form of Filipino has been used in several instrument translation studies (e.g., Bernardo, Posecion, Arnulfo, & Rodriguez-Rivera, 2005; Ganotice & Bernardo, 2010; Ganotice & Villarosa, 2011). Because English is one of the two official languages in the Philippines, retaining English words which are used in colloquial Filipino language may be more meaningful. In one translation study for example (Bataclan & Dial, 2009), the authors reported difficulty in translating the words 'moderate' and 'quite a bit' and 'excellent' and 'very good' because some Filipinos may regard those words as similar when translated to Filipino. Hence, the authors' decision was to retain the original English words.

2.6 Sport and Exercise Psychology Research in the Philippines

Physical education and sports science (PESS) research in the Philippines is slowly gaining momentum (Madrigal, Reyes, Pagaduan, & Espino, 2010). However, there seems to be an absence of academic journals focusing specifically on PESS-related studies in the country (Philippine E-Journals Online, 2012). An anecdotal review of article titles published in the Philippine Journal of Psychology from 1971-2010 revealed a limited number of studies related to sport and exercise psychology (e.g., Go-Singko-Homes, 1989; Maculada, 2007) or motivational studies using Self-Determination Theory as framework (e.g., Fernandez, 2008). One article discussing the use of autonomy support in strength and conditioning

with a Filipino primary author (Pagaduan, Kritz, Wilson, & da Silva Palmeira, 2011) had been published. However, this article was a professional paper and was not an empirical study. Motivation specifically basic needs satisfaction in physical education, sports, and psychology appears to be an understudied area in the Philippines.

Extending the generalizability of the Self-Determination Theory in the Philippines by first validating SDT-related instruments will provide further support to SDT's claim of universality. As most psychological instruments are developed using non-Filipino samples, translation and validation of psychological scales to the Filipino language is highly encouraged by local researchers (e.g., Ganotice, 2010; Ganotice & Villarosa, 2011) to establish the cultural utility of these instruments. In addition, establishing the validity and reliability of a physical education context-specific scale may serve as an initial step to stimulate research in this area.

2.7 The Basic Psychological Needs in Physical Education Scale

Most of the studies mentioned previously adapted basic needs instruments developed in other contexts (e.g., Barkoukis et al., 2010; Cox & Williams, 2008). As SDT requires that research instruments have to be appropriate to the domain under study, there is a need for a PE-specific measure of basic needs satisfaction (Vlachopoulos et al., 2011). Researchers have previously identified that the development of a basic psychological needs fulfillment measure specific to PE context is an important avenue for future research (Standage et al., 2007).

Vlachopoulos and colleagues (2011) addressed this issue by validating the Basic Psychological Needs in Physical Education Scale, which was modified from an existing basic psychological need in exercise scale. This 12-item scale was written in Greek language and had been validated in 10 to 18 years old students. It was reported that the instrument exhibits adequate three-factor structure and internal consistencies which provides evidence that the BPNPE is a valid measure of physical education students' basic psychological needs for competence, autonomy, and relatedness. Nevertheless, further validation of this instrument is required if it is to be used in other culture. Furthermore, test-retest reliability of the BPNPE scale has not been reported.

2.8. After-School Sports Participation

Research has shown that sports participation in youth has both physical and mental health benefits in adulthood. Regular sports participation during childhood and adolescence has positive influences on physical activity later in life (Telama, Yang, Hirvensalo, & Raitakari, 2006), reduced risk of developing metabolic syndromes (Yang, Telama, Hirvensalo, Viikari, & Raitakari, 2009), and coping with job strain (Yang et al., 2010).

Participation in after-school sports seems to have different effects on students' experiences in PE. Previous studies indicated that students who participate in after-school sports generally have higher motivation in physical education than non-participants (Goudas, Dermitzaki, Bagiatis, 2001; Koka & Hein, 2003; Shen, 2012). Viira and Koka (2012) examined the differences in perceived teacher-autonomy support, fulfillment of the three basic needs, and other SDT-based constructs among Estonian students with and without after-school sports experience. They reported that boys who had after-school sports experience reported higher levels of perceived autonomy support, competence needs, relatedness needs, and autonomy needs fulfillment. Moreover, they also reported that girls who participate in after-school sports reported higher levels of autonomy and competence needs fulfillment. The authors suggested that PE teachers should adopt need supportive strategies in order to facilitate students' positive experiences in physical education especially in those who have limited sports experience.

2.9 Summary of Literature Review

School physical education is an important venue to promote physical activity among young people. By influencing the students' motivation towards physical activity as a health-enhancing behaviour, it is assumed that this will help them to remain physically active outside of school and later in life. The BPN Theory, a sub-theory of SDT, suggests that supporting the PE students' three basic psychological needs promotes self-determined motivation and enhances their psychological well-being. SDT assumes that the three basic needs for competence, autonomy, and relatedness, are innate and universal in human beings, regardless of gender, age, or culture. However, the need exists to validate this claim whenever researchers intend to use SDT in another culture. The emic-etic approach to translating research instruments is abundant in the sports and exercise psychology

literature thus the process of scale translation and validation should not pose a huge challenge.

The BPNPE scale was developed recently and has not been validated in other culture such as the Philippines. As physical inactivity among young people is a critical health issue affecting both developed and developing countries around the world, understanding how motivation towards physical activity can be influenced in the PE context is vital. Nonetheless, theories developed in other cultures like the BPN Theory have to be validated first in the target culture before it can be applied. It is therefore important that the fundamental tenets of SDT be verified in Filipino culture through the process of instrument translation and validation. This will provide evidence of the applicability of SDT as a framework for practice and/or research in the Philippines.

3 PURPOSE OF THE STUDY

The primary objective of this study was to examine the factor structure, construct validity, and reliability of the Filipino version of the Basic Psychological Needs in Physical Education Scale (BPNPE: Vlachopoulos et al., 2011). The hypothesis was that the Filipino version of the BPNPE Scale consisted of a 3-factor structure reflective of the 12-item Greek version.

The secondary purpose was to explore if levels of perceived autonomy support, basic needs satisfaction, and subjective vitality were different between students who do and do not participate in out-of-school sports. More specifically, this study dealt with the following research questions:

1. Does the Filipino BPNPE Scale demonstrate adequate internal consistency and test-retest reliabilities?
2. Does the Filipino BPNPE Scale have acceptable construct validity?
3. Does the Filipino BPNPE Scale reflect a three-factor structure similar to the original Greek version?
4. Do students who participate in after-school sports report higher perceived autonomy support, basic needs fulfillment, and subjective vitality compared to those who have no after-school sports experience?

4 METHODS

4.1 Research Design

This correlational and cross-sectional quantitative research reported the psychometric properties of an instrument designed to measure basic needs fulfillment in the context of physical education. Relationships between items and the hypothesized latent variables were examined using exploratory quantitative methods to determine the factor structure of this instrument. Adequacy of the construct validity and instrument reliability were described and compared against values published in the literature. Differences between groups in the study variables were also tested.

4.2 Participants

Four hundred and eight students (192 boys; 216 girls) from two public high schools located in a highly-urbanized city in Metro Manila, Philippines, completed a two-page questionnaire (Appendix A) designed for this study. All 4 junior high school year levels were adequately represented with a total of 111 (27.2%) first year students, 93 (22.8%) second years, 101 (24.8%) third years, and 103 (25.2%) fourth years. Age ranged from 11 to 19 years ($M = 13.97$; $SD = 1.38$). Mean of body mass index (BMI) was 19.29 ($SD = 3.68$).

The participants cited that they use 1 to 3 languages in their day-to-day communication. Three hundred seventeen (317) mentioned that they only speak one language. Of these, 163 use only Tagalog (51.42%), 149 use only Filipino (47.00%), and 4 use English (1.26%) as medium of daily communication. Filipino is the national language of the Philippines and it is mainly based on the Tagalog language (Paz, 1996). “Tagalog” can also be considered a colloquial for “Filipino” and “Tagalog” (Gonzales, 1998) hence both words are frequently used interchangeably. Seventy-three (18.89%) reported to speak at least 2 languages with 32 (43.84%) of them use English. Only a small number of students ($n = 8$) reported to speak at least 3 languages. This was expected as the sample was taken from Metro Manila where Tagalog is the standard language of conversation (Paz, 1996).

Of the 408 students who participated in this study, only 137 (33.6%) indicated that they participate in “after-school” or “extra-curricular” sports. Two hundred seventy-one

(66.9%) indicated they do not participate in sports after school. Of the 137 who said they participate in “after-school” or “extra-curricular” sports, 75 (54.70%) were boys and 62 (45.30%) were girls. The students who engage in “after-school/extra-curricular” sports indicated that they participate from 1 to 8 times per week ($M = 2.41$; $SD = 1.37$; $Md = 2.00$), and from 5 to 300 minutes per session ($M = 78.72$, $SD = 63.20$; $Md = 60.00$). Boys participate in after-school sports 1-8 times per week ($M = 2.60$; $SD = 1.47$; $Md = 2.50$), 5 to 240 minutes per session ($M = 85.94$; $SD = 67.46$; $Md = 60.00$). Girls engage in these activities 1 to 5 times per week ($M = 2.19$; $SD = 1.21$; $Md = 2.00$) and 5 to 300 minutes per session ($M = 69.93$; $SD = 56.95$; $Md = 60.00$).

The students listed a total of 29 different sports activities that they were participating in. The 3 most mentioned by all were basketball (29.9%), badminton (26.3%), and volleyball (20.4%). For boys, the top 3 most mentioned activities were basketball (52.0%), badminton (25.3%), and volleyball (14.7%). For girls, the top 3 activities were volleyball, (27.4%), badminton (27.4%), and soccer (12.9%) or table tennis (12.9%).

The Philippines is currently implementing the revised K+12 basic education programme which consists of kindergarten (1 year), elementary (6 years), junior high school (4 years), and senior high school (2 years) (UNESCO, 2011). The respondents in this study are junior high school students. Approximate age of junior high school students in the Philippines is between 12 to 15 years old (UNESCO, 2009). Physical education is compulsory in all 4 junior high school year levels. However, it is integrated in the *Makabayan* subject which is one of the five learning areas under the revised basic secondary education curriculum. *Makabayan*, which means “nationhood” or “patriotic” in Filipino, has a total time allotment of 240 minutes per week and includes the following components: (1) Social Studies, (2) Education Technology at Home and at Work, (3) Music, Arts, Physical Education, and Health (MAPEH), and (4) Values Education (Lapus, 2008). The MAPEH, or MSEPP (*Musika, Sining, Edukasyong Pangkatawan at Pangkalusugan*) in Filipino, component is allotted 60 minutes per day and 4 days per week, which means that students have PE for only one hour per week. The two schools included in this study are public educational institutions, and follow the prescribed national curriculum for MAPEH.

4.3 Measures

4.3.1. Basic Psychological Needs

The Basic Psychological Needs in Physical Education Scale (BPN-PE: Vlachopoulos et al., 2011) was used to assess students' level of need fulfillment in PE. The 12-item BPN-PE is composed of 3 subscales with 4 items each. The 3 factors assess need fulfillment of autonomy ("I feel like the activities we are doing have been chosen by me. [*Pakiramdam ko ay ako ang pumili ng mga activities namin sa PE*]"), competence ("I feel I do very well even in the tasks considered difficult by most of the children. [*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 ("I feel like I have a close bond with my classmates. [*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 (*I don't agree at all*) to 7 (*I agree completely*). Vlachopoulos and colleagues (2011) reported that Cronbach's alpha for autonomy ranged from .80 to .84, for competence between .80 and .86, and for relatedness from .88 to .92.

4.3.2. Perceived Autonomy Support

The short 6-item version of the Health Orientation Climate Questionnaire (Williams, Grow, Freedman, Ryan, & Deci, 1996) was used to measure perceived autonomy support (PAS). As with previous researches (e.g., Vlachopoulos et al., 2011; Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003), the wordings of the instrument were modified slightly to suit the PE context. The students responded to each item using a 7-point Likert type scale which ranged from 1 (strongly disagree) to 7 (strongly agree). Factor analysis resulted in one-factor structure which is consistent with the literature. Internal consistency of this modified scale has been reported to range from 0.81 (Vlachopoulos, 2012) to 0.93 (Hagger et al., 2003).

4.3.3. Subjective Vitality

The Subjective Vitality Scale is a 7-item instrument designed as a proxy measure of well-being (Ryan & Frederick, 1997). Bostic, Rubio, & Hood (2000) reported that internal reliability of this one-factor scale ranged between 0.80 and 0.89. As suggested by Bostic et al. (2000), deleting item 2 would increase the effectiveness of the scale. To be

consistent with existing literature, item 2 was not included to compute the mean score for subjective vitality.

4.4 Procedure

4.4.1. Translation and Back-Translation

A combined back-translation committee approach was employed in this study. The translation committee is composed of eight bilingual Filipinos including the main researcher and the research supervisor, a Greek bilingual. The Filipino bilinguals were graduate students and/or faculty members of large state and private universities in Metro Manila. Two committee members, including the researcher, are university-level PE instructors with master's degree in physical education; two members are social psychology professors; two have master's degree in education; one is a Filipino university professor; and, one is PhD student and a research methods expert with experience in instrument translation.

The author emailed copies of the English versions of the research instruments to three of the committee members for forward translation. A total of four committee members, including the author, translated the research instrument to conversational Filipino, a language form most commonly used in day-to-day communication in the Philippines specifically in Metro Manila. This language form is more conversational and is comprised of informal Filipino terms and simple English words. Previous instrument translation studies in the Philippines used this language form (e.g., Bernardo, et al., 2005; Ganotice & Bernardo, 2010; Ganotice & Villarosa, 2011) to better capture rich and meaningful responses from the research participants.

4.4.2. Pilot Test

The experimental Filipino version of the BPNPE scale was administered by a research assistant to a small group of first year high school students ($n = 10$). The instructions provided to the students were based on the standardized protocol designed for this study. After the students have completed the questionnaire, they were interviewed informally and asked if the statements were clear and if they understood the meaning of each item. They were also asked to identify words which were vague and/or to suggest terms which are

more commonly used in their day-to-day language. In general, the statements in the questionnaire were clear to the students and they understood what each statement meant, except for the words “out-of-school sports” in the demographic section. Upon consultation with one of the members of the translation committee, it was suggested that “out-of-school” might have a negative connotation among Filipinos and was not understood as “sports activities engaged in outside of school hours”. The term “out-of-school” was replaced with “after-school or extra-curricular sports” because these are more commonly used in the Philippines to refer to the said activities.

4.4.3. Procedure

A letter requesting to conduct research study in public high schools were sent to the Department of Education Quezon City Division Office. After the permit was released, the author contacted the principals of 2 target institutions and requested the dates for data gathering.

At the day of data collection, the students were instructed to answer the questionnaire as honestly as they could. The respondents were also informed that their participation in the study was voluntary and that they may choose not to answer the questionnaires. They were instructed to return the questionnaires unmarked at the end of the period if they decided not to participate in the study.

To decrease the influence of social desirability, they answered the questionnaire without the presence of their PE teacher and they were assured that the questionnaires would remain anonymous and in no way can be traced back to them. Upon submission of the completed instrument, the students are also asked to fold the questionnaire in half and to drop their papers in an unmarked box located near the exit. This ensures that even the researcher would not be able to identify the students who completed the survey. The students took 20 to 30 minutes to complete the questionnaire.

4.5 Data Analysis

Data were encoded and analyzed using the Statistical Package for Social Sciences (IBM ©, SPSS Version 20.0). The data set was first examined for missing values using the missing value analysis function of the software. Mean substitution was used to replace missing

data. Preliminary examination of descriptive statistics, alpha coefficients, and correlations among all variables was conducted to check initial reliability and validity of the instruments. For reliability, Cronbach's alpha coefficient of each variable was calculated to determine internal consistency. Next, intra-class coefficient was computed to assess test-retest reliability.

Bivariate Pearson correlation analysis was performed to examine relationships between all study variables and to determine the scale's construct validity. Factorability of the 12-item BPNPE scale was then examined, and all assumptions for factor analysis were checked. An exploratory factor analysis using Principal Axis Factoring (PAF) with direct oblimin rotation was conducted to determine the factor structure of the Filipino BPNPE Scale.

Lastly, a multivariate analysis of variance (MANOVA) was used to test possible group differences (i.e., with versus without after-school sports participation) in all study variables. All assumptions (e.g., sample size, normality, outliers, etc.) for this multivariate test were met.

5 RESULTS

5.1 Preliminary Data Screening and Internal Consistency

The data set was screened prior to the actual analysis according to the steps outlined in the literature (Tabachnick & Fidell, 2007). First, items were examined for missing values. Several cases were found to have missing values. Little's Missing Complete at Random test (MCAR: Little, 1988) was then performed to determine if the pattern of these missing values were at random. The null hypothesis that the pattern of missing values is random was rejected, $\chi^2(471) = 712.07, p = 0.000$. Mean substitution, a conservative data imputation technique, was used to replace the missing values because deletion of cases is not the recommended approach in this situation (Tabachnick & Fidell, 2007). According to Tabachnick and Fidell (2007), effects of using mean substitution would be negligible if the number of missing values is only less than 5% of the total.

Next, assumptions of normality were examined. Distribution of each item was checked for normality by visually checking the skewness and kurtosis values derived from explore data output. All values were within the acceptable range of 2.0 which means that the range of answers in each item exhibits a normal distribution. Normal Q-Q plots were also visually examined and revealed no significant outliers that may significantly influence the results of the analyses. Finally, Kolmogorov-Smirnov Test of Normality revealed that all items deviated from normal distribution. This test, however, is sensitive to large sample sizes (Field, 2009) hence the final decision of normality assumption was based on the first two criteria.

Each of the three subscales of the Filipino BPNPE scale was then subjected to reliability analysis to examine inter-item agreement prior to factor analysis. Inter-item correlations of the autonomy subscale above .30 (Range: .33 - .47) with an overall Cronbach's alpha coefficient of .70. Item total statistics was examined and showed no problematic item hence all 4 items were retained. Competence subscale had inter-item correlation values which ranged from .47 to .59. This factor's alpha coefficient was .83. No significant increase in Cronbach's alpha value was observed when any of the items was deleted therefore all items are accepted. All inter-item correlations of the relatedness subscale

ranged from a low of .37 to a high of .61. Cronbach's alpha value of this subscale was .76. All 4 items were retained after examining the item-total statistics.

Internal consistency reliabilities of the other two scales included in this study were also computed. For perceived autonomy support, Cronbach's alpha coefficient was .76. All 6 items were retained. For subjective vitality, Cronbach's alpha value is .84 if all 7 items were included. Removing item #2 would increase the alpha coefficient to .88. Hence, only the 6 items were retained.

Mean scores of perceived autonomy support (PAS), competence needs (COM), relatedness needs (REL), autonomy needs (AUT), and vitality (VIT) were then computed. The mean of the 6 perceived autonomy items was computed to produce a composite PAS score. Four items for autonomy needs were aggregated to produce the mean score for AUT. The average score of the four competence needs items represents the score for COM, and the average of the four relatedness needs items represents the score for REL. Mean score for subjective vitality was computed using 6 items instead of 7 for reasons mentioned in the methodology section and the results of the reliability analysis. Mean scores of all five variables were above the midpoint value of 4.0. Table 1 below shows the descriptive statistics of all study variables.

Table 1. *Descriptive Statistics of Perceived Autonomy Support, 3 Needs Fulfillment and Subjective Vitality*

Variable	N	Mean	SD	α	Skewness	Kurtosis
Autonomy Support (PAS)	408	5.63	0.98	.76	-1.02	1.57
Autonomy Needs (AUT)	408	4.64	1.28	.70	-.22	-.50
Competence Needs (COM)	408	5.10	1.28	.83	-.79	.33
Relatedness Needs (REL)	408	5.39	1.23	.76	-.72	-.18
Subjective Vitality (VIT)	408	5.72	1.10	.88	-1.15	1.67

Note. PAS (6 items). AUT (4 items). COM (4 items). REL (4 items). VIT (6 items).

To determine which of the three basic needs were rated highest by the participants, a repeated measures ANOVA was conducted. Results showed that significant difference was observed among the three basic needs fulfillment for competence, relatedness, and autonomy, $F(2,406) = 93.08$, $p = 0.000$, $\lambda = .69$, $\eta_p^2 = .31$. Post-hoc analyses showed that

REL ($M = 5.89$; $SD = 1.23$) was significantly higher compared to both COM ($M = 5.10$; $SD = 1.28$), $p = .000$, and AUT ($M = 4.64$; $SD = 1.28$), $p = .000$. COM ($M = 5.10$; $SD = 1.28$) was also significantly higher compared to AUT ($M = 4.64$; $SD = 1.28$), $p = .000$.

5.2 Test-Retest Reliability

A small number of first year students ($n = 47$) from one of the schools answered the questionnaire again after one week to assess the test-retest reliability of Filipino version of the BPNPE scale. Mean score for Competence had a non-statistically significant change with an ICC value of .46. For Relatedness, mean score changed significantly from 4.86 ($SD = 1.49$) to 5.35 ($SD = 1.17$), $F(1) = 6.07$, $p = .018$, with an ICC value of .47. Mean score for Autonomy increased from 4.19 ($SD = 1.50$) to 4.73 ($SD = 1.15$), $F(1) = 7.03$, $p = .011$, with an ICC value of .43.

5.3 Construct Validity

Bivariate Pearson correlation analysis was conducted to examine the relationship between the 3 BPNPE factors and autonomy support as well as the relationship between the 3 BPNPE factors and subjective vitality. Inter-correlations among the 3 BPNPE factors were moderate ranging from .37 to .60. All 3 basic needs of competence, autonomy, and relatedness were significantly correlated with perceived autonomy support, as well as subjective vitality. Table 3 reports the correlation coefficient between these variables.

Table 2. *Summary of Intercorrelations, Means, and Standard Deviations for Perceived Autonomy Support, Competence Needs, Relatedness Needs, Autonomy Needs, and Vitality (N = 408 students)*

	M	SD	α	1	2	3	4	5
PAS	5.63	0.98	.76	-	.47**	.37**	.47**	.40**
AUT	4.64	1.28	.70		-	.57**	.60**	.40**
COM	5.10	1.28	.83			-	.53**	.37**
REL	5.39	1.23	.76				-	.42**
VIT	5.72	1.10	.88					-

Note. **Correlation is significant at the 0.01 level (2-tailed)

5.4 Factor Analysis

As mentioned previously, all 12 Filipino BPNPE scale items exhibited univariate normality (See Table 3). Item-total correlation coefficients of all items were also examined and found to be acceptable (Range: .49 - .65). In addition to examining the data for univariate outliers, Tabachnick and Fidell (2007) explained that it is also important to check the data for multivariate outliers. The classical approach is to compute the Mahalanobis distance of each case to detect multivariate outliers (Penny, 1996).

Mahalanobis distances of the 12 BPNPE items were requested via the regression function of IBM-SPSS 20.0. Seventeen cases (4.2%) were identified as multivariate outliers with Mahalanobis distance values greater than $\chi^2(12) = 32.91, p = 0.001$. These outliers were marked and when removed from the data set, the sample size was reduced to 391. Factor analyses were performed on both the complete ($N = 408$) and reduced ($N = 391$) data sets. Because the results of the analysis using the complete data set produced a more simple structure, the following report was based on the complete data set. Floyd and Widaman (1995) mentioned that assumption of multivariate normality is not required for certain exploratory methods such as principal axis factoring.

Item correlation matrix was also examined to determine factorability of the data. All items were correlated with at least one other item by .3. The sample size was adequate based on the overall Kaiser-Meyer-Olkin value, $KMO = .89$, and case per item ratio (i.e., 34 cases/item). KMO values ranging from .80 to .90 are considered “great” according to Field (2009, p. 659). KMO values for individual items were also examined from diagonals of the anti-image correlation matrix. All values ranged from .83 to .91 and these are above the minimum acceptable value of .50 (Field, 2009). The correlations between items were also adequate for factor analysis as indicated by Bartlett’s test of sphericity, $\chi^2(66) = 1807.19, p = 0.000$. Furthermore, communalities were above .3 indicating that each item shared a common variance with the other items.

Table 3. *BNPE Item Descriptives*

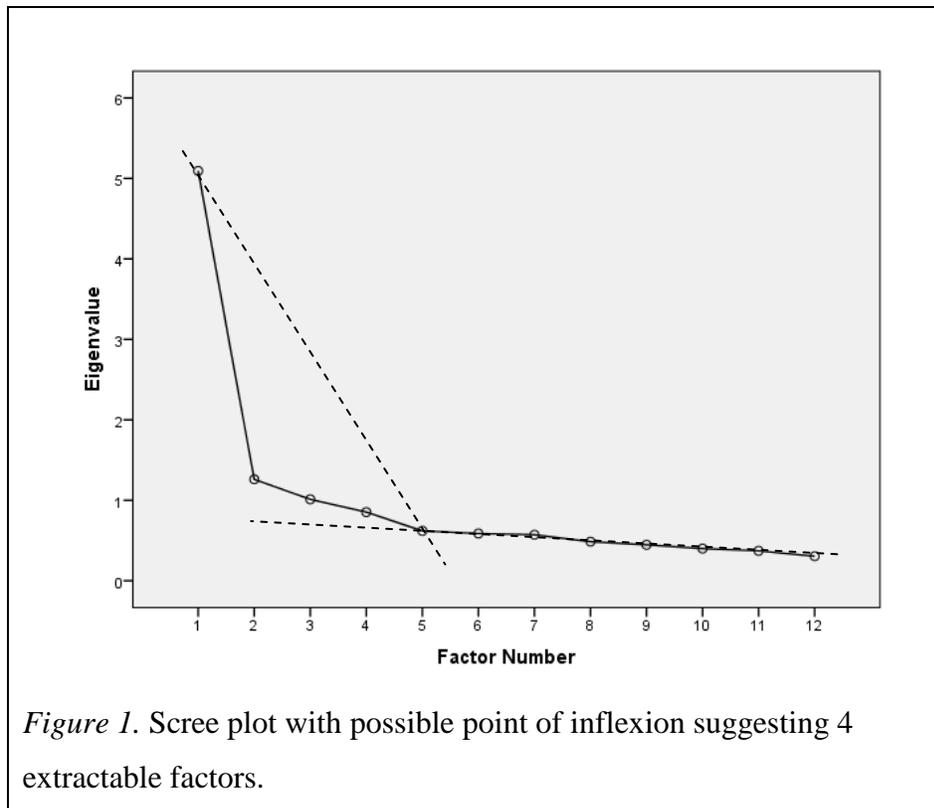
Item	M	SD	Skewness	Kurtosis	Item-Total Correlation
Autonomy 1	5.24	1.63	-.85	.01	.51
Autonomy 2	4.38	1.86	-.41	-.86	.52
Autonomy 3	5.14	1.54	-.75	-.08	.63
Autonomy 4	3.80	2.02	.04	-1.18	.49
Competence 1	4.96	1.72	-.66	-.38	.52
Competence 2	5.18	1.49	-.77	.01	.63
Competence 3	5.05	1.57	-.79	.07	.65
Competence 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	1.01	.54
Relatedness 3	5.00	1.75	-.71	-.38	.60
Relatedness 4	4.97	1.91	-.76	-.56	.56

Note. $N = 408$

Principal Axis Factoring with direct oblimin rotation analysis extracted three factors with eigenvalues greater than 1.0. Together, these three factors accounted for 61.38% of the total variance. Factor 1 accounted for 42.45% of the total variance and contained 5 items, 4 of which are the 4 items for Relatedness. The 5th item was originally an item for Autonomy. Factor 2 accounted for 10.50% of the total variance and consisted of 5 items, 4 of which represents Competence and the other one was originally an Autonomy item. Lastly, factor 3 accounted for 8.43% of the total variance and composed of 2 items representing Autonomy. After extraction, factor 1 accounted for 38.29% of the variance, factor 2 explained 6.70% and factor 3 explained 3.96%. Only items with factor loading values of .40 were interpreted.

Factor correlation matrix indicated that correlations among the three resulting factors were moderate and above the usual criterion of $r = .32$ (Tabachnick & Fidell, 2007). Correlation coefficient between factor 1 (relatedness) and factor 2 (competence) was $-.58$. Factor 1 and factor 3 (autonomy) was correlated by $r = .53$. Factor 2 was correlated with factor 3 by $r = -.43$.

Visual examination of the Scree Plot showed a steep angle after the first component suggesting that there was definitely one big factor to be retained. The plot also appeared to suggest that there were 4 extractable factors based on the point of inflexion as illustrated in Figure 1.



Follow up parallel analysis was conducted as recommended in the literature (Kahn, 2006; Lance, Butt, & Michels, 2006). This should assist in deciding which factors to retain in addition to Kaiser criterion and Scree plot (Hayton, Allen, & Scarpello, 2004). Results of the parallel analysis (Watkins, 2000) suggested that there were indeed three factors to be retained. The actual eigenvalues were compared to criterion values which were generated based on permutations of the raw data set (O'Connor, 2000). As explained by Pallant (2010), the factor is retained if its actual eigenvalue is greater than the one generated from the parallel analysis. Table 4 summarizes the factor retention decision based on parallel analysis.

Table 4. *Comparison of Eigenvalues from PAF and Criterion Values from Parallel Analysis*

Factor number	Actual eigenvalue from PAF	Criterion value from parallel analysis	Decision
1	5.09	1.28	Accept
2	1.26	1.21	Accept (with caution)
3	1.01	1.16	Reject (with caution)
4	0.85	1.10	Reject
5	0.62	1.06	Reject
6	0.59	1.01	Reject
7	0.57	0.97	Reject
8	0.49	0.93	Reject
9	0.45	0.89	Reject
10	0.40	0.85	Reject
11	0.37	0.80	Reject
12	0.30	0.74	Reject

Although the analysis resulted to a simple structure, two of the items did not load on their intended factor. Autonomy item 3 (“I feel that the way classes are taught is a true expression of who I am./*Sa PE, pakiramdam ko na ang mga klase ay tunay na nagpapahayag ng pagkatao ko.*”) loaded on Relatedness factor, $r = .51$, while autonomy item 1 (“We do things that are of interest to me./*Sa PE, ginagawa naming ang mga bagay na interesado ako.*”) loaded on Competence factor, $r = -.42$. Possible reasons are provided in the discussion section. Table 5 (Appendix C) shows the pattern coefficients and communalities of all 12-BPNPE items.

Internal consistency reliabilities of all 3 extracted factors were subsequently analyzed. The 5-item relatedness factor had good internal consistency with Cronbach alpha value of .80. Inter-item correlation ranged from .36 to .61. No item was recommended for removal based on the item-total statistics. However, comparison of means between the 5-item versus 4-item relatedness subscale showed significant differences, $t(407) = -3.96$, $p = .000$.

The mean of the 4-item relatedness subscale was higher compared to the mean of the 5-item subscale. The 4-item subscale was therefore used to report levels of relatedness needs fulfillment in the subsequent analyses.

Reliability analysis of the 5-item competence factor resulted to a Cronbach alpha of .82. Inter-item correlation ranged from .31 to .59. Item-total statistics, however, revealed that internal consistency is enhanced if the autonomy item 3 was removed, $\alpha=.83$. Additional analysis was also conducted to compare the means of the 4-item competence to that of the 5-item version. No significant difference was found between the two means hence the 4-item scale was used to report levels of competence needs fulfillment in the subsequent analyses.

The third factor is composed only of 2 autonomy items. Correlation coefficient between the two items is .47. Cronbach alpha of this 2-item factor was .64. Paired *t*-test showed that the mean score using all 4 autonomy items was greater than using only items 2 and 4, $t(407) = -14.68, p = .000$. For the subsequent analyses, only the 2 items were used to compute the mean score for autonomy need subscale.

5.5 Differences in Perceived Autonomy Support, Basic Needs, and Vitality

A one-way between groups multivariate analysis of variance (MANOVA) was conducted to determine differences in all 5 study variables between students with and without after-school sports participation. Mean scores of the three basic needs were computed based on the decisions made in the previous section. Mean scores were computed for competence needs (4 items), relatedness needs (4 items), autonomy needs (2 items), perceived autonomy support (6 items), and subjective vitality (6 items). See Table 6 for details.

Assumptions of normality, linearity, and univariate outliers were satisfied. However, seven cases (1.72%) were detected as multivariate outliers with Mahalanobis distance values greater than $\chi^2(5) = 20.52, p = .001$. These outliers were removed from data set reducing the sample size to 401. Perceived autonomy support, competence need, relatedness need, autonomy need, and subjective vitality were entered as dependent variables and after-school sports participation as independent variable.

Table 6. *Descriptive statistics of all 5 study variables by after-school sport participation in boys (n = 188) and girls (n = 213).*

	Overall		With (n=136)		Without (n=265)		F	η_p^2
	M	SD	M	SD	M	SD		
PAS	5.65	.93	5.76	.85	5.58	.96	3.84	.010
Boys			5.71	.95	5.45	1.02	3.13	.017
Girls			5.85	.71	5.68	.91	1.65	.008
COM	5.12	1.25	5.32	1.20	5.02	1.26	5.03	.012
Boys			5.41	1.19	4.99	1.19	5.49	.029
Girls			5.21	1.21	5.05	1.31	.69	.003
REL	5.40	1.22	5.39	1.26	5.40	1.20	.01	.000
Boys			5.34	1.37	5.34	1.18	.00	.000
Girls			5.46	1.13	5.45	1.22	.00	.000
AUT ¹	4.10	1.65	4.31	1.67	3.99	1.63	3.38	.008
Boys			4.34	1.77	4.02	1.66	1.53	.008
Girls			4.28	1.54	3.97	1.61	1.67	.008
VIT	5.74	1.06	5.97	.89	5.62	1.12	**10.57	.026
Boys			5.93	.88	5.66	1.16	3.04	.016
Girls			6.02	.90	5.58	1.09	**7.86	.036

Note. $N = 401$. ¹Only two items were used to compute the mean score for Autonomy needs (AUT) based on factor analysis results. ** $p < 0.01$.

Results showed statistical difference between groups on the combined dependent variables, $F(5,395) = 4.12$, $p = .001$, $\lambda = .95$, $\eta_p^2 = .05$. A Bonferonni corrected alpha ($\alpha = .01$) was used to determine statistical difference in the individual variables. Separate univariate analysis of variance showed that significant difference was observed only in VIT, $F(1,399) = 10.57$, $p = .001$, $\eta_p^2 = .03$. Examination of the mean scores indicated that students who do not participate in after-school sports reported lower levels of subjective vitality in physical education ($M = 5.97$, $SD = .89$) compared to those who do ($M = 5.62$, $SD = 1.12$).

The previous procedure was repeated to examine boys and girls separately. All preliminary assumptions were met for both boys and girls data. Results indicated that significant difference in the 5 study variables could be observed in girls, $F(5,207) = 2.54$, p

= .03, $A = .94$, $\eta_p^2 = .06$, but not in boys. Examining the results of the 5 dependent variables separately revealed that only subjective vitality reached statistical significance, $F(1,211) = 7.86$, $p = .006$, $\eta_p^2 = .04$. More specifically, girls who participated in after-school sports ($M = 6.02$, $SD = .90$) reported higher level of subjective vitality in PE compared to their peers who did not have sports experience ($M = 5.58$, $SD = 1.09$).

6 DISCUSSION

This study reports preliminary reliability and validity evidence of the Filipino BPNPE Scale adapted from Vlachopoulos and colleagues' 12-item BPNPE, an instrument designed to assess fulfillment of the three basic psychological needs in the context of physical education. The Basic Psychological Needs Theory suggests that individuals have three basic needs that have to be satisfied in order to feel energized and motivated regardless of age, gender, or culture. This section discusses the results and conclusion of this research. Limitations of the study, recommendations for practice, and implications for future research are also presented.

6.1 Basic Psychological Needs Fulfillment in Physical Education

Descriptive statistics indicated that the respondents reported moderately high levels of psychological needs fulfillment in PE. Comparison of means across the three basic needs showed that the students rated relatedness needs fulfillment higher than competence and autonomy needs. Of the three needs, autonomy was rated the least. This trend is in accordance with earlier findings (e.g., Vlachopoulos et al., 2011; Barkoukis et al., 2010; Koka & Hagger, 2010). To this author's knowledge, only two previous studies (i.e., Vlachopoulos et al., 2011; Vlachopoulos, 2012) had used the original BPNPE scale and reported a similar pattern. Although differences were not statistically established, examining the means of the three basic needs in these two studies showed that relatedness was ranked first, competence second, and autonomy last. Past researches had shown that relatedness is associated with autonomous motivation (Cox & Williams, 2008), enjoyment in PE (Cox, Duncheon, & McDavid, 2009), optimal experiences in PE (Cox & Ullrich-French, 2010), and prosocial behaviour (Pavey, Greitemeyer, & Sparks, 2011). It can be also be used as a pedagogical platform to develop competence in PE (Sun & Chen, 2010).

Results of scale reliability analyses established that the three BPNPE factors have adequate internal consistency with values nearly comparable with earlier findings (e.g., Vlachopoulos et al., 2011; Vlachopoulos, 2012). Vlachopoulos (2012), for example, reported that the Cronbach alpha coefficient for competence was .86, for autonomy was .81, and for relatedness was .86. In the present study, alpha coefficient for competence

was .83, for autonomy was .70, and for relatedness was .76. All of these values are acceptable based on the minimum cut-off criterion of .70 (Kaplan & Saccuzzo, 2005).

6.2 Does the Filipino BPNPE Scale demonstrate adequate test-retest reliability?

Vlachopoulos and colleagues (2011) recommended that future studies should look at the stability of the BPNPE over short time interval. Intraclass correlation coefficient (ICC) similar to the one used in Vlachopoulos and Michailidou (2006) was used to test the stability of the scale over a one week period. Results indicated that the three BPNPE subscales have moderate stability with ICC values ranging from .43 to .47. However, all three ICC values were below the acceptable level of .70 which means that the Filipino BPNPE scale has inadequate test-retest reliability. A closer examination of the means indicated that there was no significant change in the competence scores between the two measurement points suggesting that scores obtained in this factor were stable. On the contrary, both autonomy and relatedness mean scores changed significantly over the one week period. Mean scores of both autonomy and relatedness in the second measurement were higher compared to the first measurement. Possible intervening factors in poor test-retest reliability include researcher error, environmental changes, participant changes, and carry-over effect (Kaplan & Saccuzzo, 2005). To this author's knowledge, test-retest reliability of the BPNPE scale has not established in the literature (see Vlachopoulos et al., 2011). Nevertheless, the exercise version from which the BPNPE scale was derived has been reported to have high test-retest reliability over a 4-week time interval (Vlachopoulos et al., 2006).

6.3 Does the BPNPE Scale have acceptable construct validity?

Construct validity of the Filipino BPNPE scale was established by examining the relationships between the three need subscales with perceived teacher-autonomy support and subjective vitality. According to the BPN Theory (Deci & Ryan, 2008; Ryan & Deci, 2002), these constructs are inter-related. Each of the needs fulfillment subscales was significantly correlated with both perceived autonomy support and subjective vitality providing preliminary evidence of construct validity. The strengths of each relationship were consistent with previous studies (Vlachopoulos et al., 2011; Vlachopoulos, 2012)

which reported that correlation coefficients between these variables were all positive and moderate.

6.4 Does the Filipino BPNPE Scale reflect a three-factor structure?

The BPN Theory posits that there individuals have three basic needs and these must be fulfilled in order for optimal motivation and well-being (Ryan, Williams, Patrick, & Deci, 2009). Results of the exploratory factor analysis demonstrated that the Filipino version consists of a three-factor structure similar to the original BPNPE version albeit with some inconsistencies in item membership. For example, two autonomy items did not load on their intended factor. Autonomy item 1 (“We do things that are interest to me.”) loaded on competence while autonomy item 3 (“I feel that the way classes are taught is a true expression of who I am”) loaded on relatedness. Autonomy item 1, however, had weak loading (.43) which was also confirmed by reliability analysis. Autonomy item 3, however, loaded strongly (.51) on relatedness factor.

Bernardo, Zhang, & Callueng (2002) recommended that cultural concepts should be explored in understanding results of exploratory studies. *Kapwa* or shared identity is a core value in the Filipino culture wherein the ego (*ako*) and others (*iba sa akin*) are perceived as one (Enriquez, 1992). Because the words used to translate “a true expression of who I am” was *pagkatao ko* which literally means “my personhood,” it may be possible that the students perceived their *pagkatao* as not different from others (*hindi iba sa kapwa*) resulting to this item loading on relatedness.

The poor internal consistency of the autonomy needs subscale with Cronbach’s alpha coefficient of only .64 is an important finding of this study. While the internal consistency was acceptable when all 4 items were considered ($\alpha = .70$), results of the factor analysis indicated that only two of the 4 items loaded on the same factor. Factors or subscales which consist only of two items are considered “weak and unstable” (Costello & Osborne, 2005). The two items which did not load on the autonomy factor could be revised or additional items could be developed to enhance the reliability of this scale. The autonomy subscale appeared to be problematic even in earlier research (e.g., Ntoumanis, Barkoukis, & Thørgersen-Ntoumani, 2009). Ntoumanis et al. (2009) recommended that future research should take into consideration how autonomy is understood and defined in the

target culture. A qualitative study on how this construct is defined among Filipino high school students should provide ample evidence on how autonomy items should be written in future studies and thus enhance the reliability of this factor. As pointed out by Standage et al. (2007), involving students in instrument development is important.

6.5 Differences in Perceived Autonomy Support, Basic Needs, and Vitality

After-school sports participation seemed to have no influence on Filipino students' perceptions of teacher-autonomy support and basic needs fulfillment. This finding is in contrast with previous researches indicating that students who participate in after-school sports experience higher competence needs fulfillment in physical education compared to non-participants (Ntoumani et al., 2009; Viira & Koka, 2012). For example, Viira and Koka (2012) found that students who participate in after-school sports had higher perceptions of competence compared to those who do not have such experience. They explained that after-school sports participation influence perception of competence in PE probably because these students were already skillful and competent in sports. PE activities, the authors further explained, fulfilled the students' basic needs for competence and hence the students felt more energized and alive in class. In the present study, although results of MANOVA indicated no statistical difference between the after-sports and non-after-sports participants, examining the means visually indicated that after-sports participants reported higher competence need fulfillment than non-participants. This result suggests that after-school sports participation may have some influence in students' competence needs fulfillment in PE.

Separate MANOVA for boys and girls were then conducted to examine if after-school sports participation had the same effects on both genders. This procedure was similar to the one performed by Viira and Koka (2012) in their study. For boys, no significant main effect was found. For girls, results indicated that those who played sports after school experienced higher subjective vitality in PE compared to their non-active peers. Examining the means revealed that both groups reported high levels of subjective vitality (i.e., above the midpoint value of 4.0).

Filipino adolescents, especially girls, are expected to do household chores after school hours (Tudor-Locke, et al., 2003). One possible explanation why girls with afterschool

sports participation in this study feel more energized and alert in physical education is that the tasks in this setting provide them with opportunities to perform physical activity without thinking of work or pressure. Because of the cross-sectional nature of this study, it can also be argued that girls' experience of high vitality in physical education might have led them to participate in after-school sports. This result is interesting and warrant more investigation. Could the relationships between the other variables with subjective vitality provide better explanation for this difference? In sports, for example, Adie et al. (2008) found that fulfillment of basic needs predicted higher subjective vitality. Future studies should look into the influence of after-school sports participation in the relationship between basic needs fulfillment and subjective vitality.

6.6 Limitations, Recommendations for Future Research, and Implications for Practice

This study demonstrates that the Filipino BPNPE scale has a three-factor structure similar to the original instrument. However, the use of EFA and not confirmatory factor analysis is one limitation of this study. Although EFA allowed the identification of the underlying factors within the measure (Henson & Roberts, 2006), it is inappropriate to interpret that the results verifies the BPN Theory in Filipino culture. Future studies should perform a confirmatory factor analysis to provide theoretical validation. As Henson and Roberts (2006) recommends, CFA should be considered especially when there is an a priori knowledge on the data structure.

Another limitation is the use of Pearson correlation coefficient to report construct validity. The theoretical proposition is that the three basic psychological needs mediate the relationship between perceived autonomy support and subjective vitality. Previous studies supported this proposition through mediation analysis (Vlachopoulos et al., 2006, 2011). Future studies should test whether the three basic needs mediate the relationship between perceived autonomy support and vitality as suggested in the BPN Theory. This would provide further evidence of the applicability of this theory in Filipino culture.

The sample used in this study also consisted only of students from two public high schools. Although the characteristics of the students in these schools may be considered representative of students in most public high schools in Metro Manila, findings of this study cannot be generalized outside the study sample. Future research should employ a

stratified random sampling of both public and private high schools in the Philippines to extend the results of this study and enhance its external validity.

Lastly, the cross-sectional design of this study does not allow for confirmation of causal relationships. For example, the direction of the basic needs fulfillment and subjective vitality relationship could be vice versa. Experimental studies are needed if the objective is to confirm that fulfillment of basic needs leads to improved well-being.

While results of this study are preliminary, evidence suggests that satisfying the basic psychological needs in physical education of Filipino high school students influences positive experiences in this context. Several authors have recommended strategies on how to teachers can satisfy each of the three basic needs in physical education (Bryan & Solmon, 2007) and in general education (Niemec & Ryan, 2009). First, physical education teachers can focus on self-improvement, place less emphasis on competition, and provide feedback as well as challenging tasks to enhance students' competence needs satisfaction. Second, teachers can convey warmth and care towards the students, be more considerate and compassion, and also be more respectful of the students' feelings and experiences in class to fulfill needs for relatedness. And finally, teachers can provide students with opportunities to choose activities in class, avoid controlling behaviours, and minimize pressure in order to enhance autonomy needs fulfillment.

6.7 Conclusion

In conclusion, this study provides initial support for validity and reliability of an instrument to assess basic needs satisfaction in physical education among Filipino high school students. A three factor model reflective of the three basic psychological needs was identified providing support for factorial validity. Acceptable levels of construct validity and internal consistency reliability were also established. Short-term test-retest reliability, although inadequate, was also demonstrated. Overall, findings showed that the Filipino BPNPE scale is a valid tool to measure basic needs satisfaction in physical education. Instrument development is a continuous process. As there is currently no tool to assess satisfaction of basic psychological needs in physical education among Filipino students, further refinement of the Filipino BPNPE scale, especially revision of the autonomy items, is warranted.

7 REFERENCES

- Adie, J.W., Duda, J.L., & Ntoumanis, N. (2008). Autonomy support, basic needs satisfaction and the optimal functioning of adult male and female sport participants: A test of basic needs theory. *Motivation and Emotion*, 32, 189-199.
- Almagro, B.J., Sáenz-López, P., & Moreno, J.A. (2010). Prediction of sport adherence through the influence of autonomy-supportive coaching among Spanish adolescent athletes. *Journal of Sport Science and Medicine*, 9, 8-14.
- Azevedo, M.R., Araujo, C.L., da Silva, M.C., & Hallal, P.C. (2007). Tracking of physical activity from adolescence to adulthood: A population-based study. *Rev Saúde Pública*, 41(1), 69-75.
- Banville, D., Desrosiers, P., & Genet-Volet, Y. (2000). Translating questionnaires and inventories using a cross-cultural translation technique. *Journal of Teaching in Physical Education*, 19, 374-387.
- Barkoukis, V., Hagger, M.S., Lambropoulos, G., & Tsorbatzoudis, H. (2010). Extending the trans-contextual model in physical education and leisure-time contexts: Examining the role of basic psychological needs satisfaction. *British Journal of Educational Psychology*, 80, 647-670.
- Bataclan, R.P., & Dial, M.A.D. (2009). Cultural adaptation and validation of the Filipino version of kidney disease quality of life – short form (KDQOL-SF version 1.3). *Nephrology*, 14, 663-668.
- Bernardo, A., Posecion, A.B., Arnulfo, R., & Rodriguez-Rivera, E. (2005). Adapting the social axioms survey for Philippine research: Validating Filipino and English versions. *Philippine Journal of Psychology*, 38(2), 77-100.
- Bernardo, A.B., Zhang, L.F., & Callueng, C.M. (2002). Thinking styles and academic achievement among Filipino students. *The Journal of Genetic Psychology*, 163(2), 149-163.
- Biddle, S.J.H., & Mutrie, N. (2008). *Psychology of Physical Activity: Determinants, Well-being & Interventions* (2nd Ed.). London: Routledge.
- Bocarro, J., Kanters, M.A., Casper, J., & Forrester, S. (2008). School physical education, extracurricular sports, and lifelong active living. *Journal of Teaching Physical Education*, 27, 155-166.

- Bostic, T.J., Rubio, D.M., & Hood, M. (2000). A validation of the subjective vitality scale using structural equation modeling. *Social Indicators Research, 52*, 313-324.
- Bryan, C.L., & Solmon, M.A. (2007). Self-determination in physical education: Designing class environments to promote active lifestyles. *Journal of Teaching in Physical Education, 26*, 260-278.
- Cleland, V., Dwyer, T., & Venn, A. (2011). Which domains of childhood physical activity predict physical activity in adulthood? A 20-year prospective tracking study. *British Journal of Sport Medicine*. doi:10.1136/ bjsports-2011-090508
- Costello, A.B., & Osborne, J.W. (2005). Best practices in exploratory factor analysis: four recommendations for getting the most from your analysis. *Practical Assessment, Research & Evaluation, 10*(7). Retrieved from <http://www.pareonline.net/pdf/v10n7.pdf>
- Cox, A., Duncheon, N., & McDavid, L. (2009). Peers and teachers as sources of relatedness perceptions, motivation, and affective responses in physical education. *Research Quarterly for Exercise and Sport, 80*(4), 765-773.
- Cox, A., & Ullrich-French, S. (2010). The motivational relevance of peer and teacher relationship profiles in physical education. *Psychology of Sport and Exercise, 11*, 337-344. doi:10.1016/j.psychsport.2010.04.001
- Cox, A., & Williams, L. (2008). The roles of perceived teacher support, motivational climate, and psychological needs satisfaction in student's physical education motivation. *Journal of Sport and Exercise Psychology, 30*, 222-239.
- David, R. (2012, March 15). The return of the mother tongue. *Philippine Daily Inquirer*. Retrieved from <http://opinion.inquirer.net/24959/the-return-of-the-mother-tongue>
- Deci, E.L., & Ryan, R.M. (1985). *Intrinsic Motivation and Self-Determination in Human Behavior*. New York: Plenum Press.
- Deci, E.L., & Ryan, R.M. (2000). The “what” and “why” of goal pursuits: human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227-268.
- Deci, E.L., & Ryan, R.M. (2008). Self-determination theory: a macrotheory of human motivation, development, and health. *Canadian Psychology, 49*(3), 182-185.
- Dominguez, E., Martin, P., Martin-Albo, J., Nuñez, J., & Leon, J. (2010). Translation and validation of the Spanish version of the “Échelle de Satisfaction des Besoins

- Psychologiques” in the sport context. *The Spanish Journal of Psychology*, 3(2), 1010-1020.
- Dumith, S.C., Hallal, P.C., Reis, R.S., & Kohl III, H.W. (2011). Worldwide prevalence of physical inactivity and its association with human development index in 76 countries. *Preventive Medicine*, 53, 24-28.
- Fernandez, K. (2008). Motivation as mediating variable between parental support and anxiety. *Philippine Journal of Psychology*, 41(1). Abstract retrieved from [http://ejournals.ph/index.php?journal=PJP&page=article&op=view&path\[\]=5361&path\[\]=0](http://ejournals.ph/index.php?journal=PJP&page=article&op=view&path[]=5361&path[]=0)
- Field, A. (2009). *Discovering statistics using SPSS* (3rd Ed.). London: SAGE Publications.
- Floyd, F.J., & Widaman, K.F. (1995). Factor analysis in the development and refinement of clinical assessment instruments. *Psychological Assessment*, 7(3), 286-299.
- Ganotice, F.A.J. (2010). A confirmatory factor analysis of scores on Inventory of School Motivation (ISM), Sense of Self Scale, and Facilitating Conditions Questionnaire (FCQ): A study using a Philippine Sample. *Educational Measurement and Evaluation Review*, 1, 59-77.
- Ganotice, F.A.J., & Bernardo, A.B. (2010). Validating the factors of the English and Filipino versions of the sense of self scale. *Philippine Journal of Psychology*, 43, 81-99.
- Ganotice, F.A.J., & Villarosa, J.B. (2011). “We’re classmates, can we be friends?”: Translation and validation of the Filipino version of Classmates’ Friendship Questionnaire (CFQ) in the Philippines. *Educational Measurement and Evaluation Review*, 2, 124-136.
- Gonzales, A. (1998). The language planning situation in the Philippines. *Journal of Multilingual and Multicultural Development*, 19(5), 487-525. doi: 10.1080/01434639808666365
- Gonzales-Suarez, C.B., & Grimmer-Sommers, K. (2009). Physical activity pattern of prepubescent Filipino school children during school days. *Journal of School Health*, 79(7), 304-311.

- Go-Singko-Holmes, M. (1989). Running and group dynamics as treatments for psychology. *Philippine Journal of Psychology*, 22, 26-36. Abstract retrieved from <http://psycnet.apa.org/psycinfo/1992-06169-001>
- Goudas, M., Dermitzaki, I., & Bagiatis, K. (2001). Motivation in physical education is correlated with participation in sport after school. *Psychological Reports*, 88, 491-496.
- Guthold, R., Cowan, M.J., Autenrieth, C.S., Kann, L., & Riley, L.M. (2010). Physical activity and sedentary behavior among schoolchildren: A 34-country comparison. *The Journal of Pediatrics*, 157, 43-49.
- Hadi, A.S. (1992). Identifying multiple outliers in multivariate data. *Journal of the Royal Statistical Society*, 54(3), 761-771.
- Hadi, A.S. (1994). A modification of a method for the detection of outliers in multivariate data. *Journal of the Royal Statistical Society*, 56(2), 393-96.
- Hagger, M., Chatzisarantis, N.L.D., Culverhouse, T., & Biddle, S.J.H. (2003). The processes by which perceived autonomy support in physical education promotes leisure-time physical activity intentions and behavior: a trans-contextual model. *Journal of Educational Psychology*, 95(4), 784-795.
- Hagger, M., Chatzisarantis, N.L.D., Hein, V. Soos, I., Karsai, I., Lintunen, T., & Leemans, S. (2009). Teacher, peer and parent autonomy support in physical education and leisure-time physical activity: A trans-contextual model of motivation in four nations. *Psychology and Health*, 24(6), 689-711.
- Hayton, J.C., Allen, D.G., & Scarpello, V. (2004). Factor retention decision in exploratory factor analysis: a tutorial in parallel analysis. *Organizational Research Methods*, 7, 191-205.
- Hein, V., & Koka, A. (2007). Perceived feedback and motivation in physical education and physical activity. In M. Hagger and N.L.D. Chatzisarantis (Eds.), *Intrinsic Motivation and Self-Determination in Exercise and Sport*, pp.127-140, USA: Human Kinetics.
- Henson, R.K., & Roberts, J.K. (2006). Use of exploratory factor analysis in published research: common errors and some comments on improved practice. *Educational and Psychological Measurement*, 66, 393-416.

- IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.
- Janssen, I., Katzmarzyk, P.T., Boyce, W.F., Vereecken, C., Mulvihill, C., Roberts, C., Currie, C., Pickett, W., & The Health Behavior in School-Aged Children Obesity Working Group, (2005). *Obesity Reviews*, 6, 123-132.
- Kahn, J.H. (2006). Factor analysis in counseling psychology research, training, and practice: principles, advances, and applications. *The Counseling Psychologist*, 34, 684-718. doi: 10.1177/0011000006286347
- Kaplan, R.M., & Saccuzzo, D.P. (2005). *Psychological testing: principles, applications, and issues*. Belmont, CA: Thomson/Wadsworth.
- Koka, A., & Hagger, M.S. (2010). Perceived teaching behaviors and self-determined motivation in physical education: a test of self-determination theory. *Research Quarterly for Exercise and Sport*, 81, 74-86.
- Koka, A., & Hein, V. (2003). The impact of sports participation after school on intrinsic motivation and perceived learning environment in secondary school physical education. *Kinesiology*, 23, 86-93.
- Lance, C.E., Butt, M.M., & Michels, L.C. (2006). The sources of four commonly reported cutoff criteria: what did they really say? *Organizational Research Methods*, 9(2), 202-220. doi: 10.1177/1094428105284919
- Lapus, J.A. (2008). *The education system facing challenges of the 21st century. Country: Republic of the Philippines*. Retrieved on 8 April 2013 from http://www.ibe.unesco.org/National_Reports/ICE_2008/philippines_NR08.pdf
- Little, R.J.A. (1988). A test of completely missing at random for multivariate data with missing values. *Journal of American Statistical Association*, 83(404), 1198-1202.
- Maculada, S. (2007). Gender differences in task and ego goal orientations and motivation in sport participation. *Philippine Journal of Psychology*, 40(1), 123-135.
- Madrigal, N., Reyes, J.J., Pagaduan, J., & Espino, R.v. (2010). Exercise science academic programs and research in the Philippines. *International Journal of Exercise Science*, 3(4), 157-174. Available online from <http://digitalcommons.wku.edu/cgi/viewcontent.cgi?article=1291&context=ijes>
- Milyavskaya, M., Gingras, I., Mageau, G.A., Koestner, R., Gagnon, H., Fang, J., & Boiché, J. (2009). Balance across contexts: Importance of balanced need

- satisfaction across various life domains. *Personality and Social Psychology Bulletin*, 35, 1031-1045.
- Milyavskaya, M., & Koestner, R. (2011). Psychological needs, motivation, and well-being: A test of self-determination theory across multiple domains. *Personality and Individual Differences*, 50, 387-391.
- Moreno Murcia, J.A., González-Cutre Coll, D., & Ruiz Pérez, L.M. (2009). Self-determined motivation and physical education importance. *Human Movement*, 10(1), 5-11.
- Motl, R.W. (2007). Chapter 2: Theoretical models for understanding physical activity behavior among children and adolescents – social cognitive theory and self-determination theory. *Journal of Teaching in Physical Education*, 26, 350-357.
- Mouratidis, A., Vansteenkiste, M., Sideridis, G., & Lens, W. (2008). The motivating role of positive feedback in sport and physical education: Evidence for a motivational model. *Journal of Sport & Exercise Psychology*, 30, 240-268.
- Niemiec, C.P., & Ryan, R.M. (2009). Autonomy, competence, and relatedness in the classroom: applying self-determination theory to educational practice. *Theory and Research in Education*, 7, 133-144. doi: 10.1177/1477878509104318
- Ntoumanis, N., Barkoukis, V., & Thøgersen-Ntoumani, C. (2009). Developmental trajectories of motivation in physical education: course, demographic differences, and antecedents. *Journal of Educational Psychology*, 101(3), 717-728.
- O'Connor, B.P. (2000). SPSS and SAS programs for determining the number of components using parallel analysis and Velicer's MAP test. *Behavioral Research Methods, Instruments, & Computers*, 32(3), 396-402.
- Pagaduan, J.C., Kritz, M., Wilson, P.M., & da Silva Palmeira, A.L. (2011). Autonomy support in strength and conditioning. *Sport Scientific and Practical Aspects*, 8(1), 49-53.
- Pallant, J. (2010). *SPSS Survival Manual: A step by step guide to data analysis using the SPSS program* (4thed.). USA: McGraw-Hill Education.
- Pate, R.R., Davis, M.G., Robinson, T.N., Stone, E.J., McKenzie, T.L., & Young, J.C. (2006). Promoting physical activity in children and youth: A leadership role for schools: A scientific statement from the American Health Association Council on

- Nutrition, Physical Activity, and Metabolism (Physical Activity Committee) in collaboration with the councils on Cardiovascular Disease in the Young and Cardiovascular Nursing. *Circulation*, *114*, 1214-1224.
- Pavey, L., Greitemeyer, T., & Sparks, P., (2011). Highlighting relatedness promotes prosocial motives and behavior. *Personality and Social Psychology Bulletin*, *37*, 905-917. doi: 10.1177/0146167211405994
- Paz, C.J. (1996). The nationalization of a language: Filipino. *The Fourth International Symposium on Language and Linguistics*, Thailand, (pp. 2052-2059). Institute of Language and Culture for Rural Development, Mahidol University. Retrieved online on 12 November 2012 from <http://sealang.net/sala/htm/PAZConsueloJ.htm>
- Penny, K.I. (1996). Appropriate critical values when testing for a single multivariate outlier by using the Mahalanobis distance. *Journal of the Royal Statistical Society*, *45*(1), 73-81.
- Philippine E-Journals, 2012. C&E Publishing, Inc. Retrieved on 13 March 2012 from <http://ejournals.ph/index.php/JRSCE>
- Ryan, R.M., & Deci, E.L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68-78.
- Ryan, R.M., & Deci, E.L. (2002). Overview of self-determination theory: an organismic dialectical perspective. In E.L. Deci and R.M. Ryan (Eds.), *Handbook of self-determination research* (pp.3-33). Rochester, NY: University of Rochester Press.
- Ryan, R.M., & Frederick, C. (1997). On energy, personality, and health: subjective vitality as a dynamic reflection of well-being. *Journal of Personality*, *65*(3), 529-565.
- Ryan, R.M., Williams, G.C., Patrick, H., & Deci, E.L. (2009). Self-determination theory and physical activity: the dynamics of motivation in development and wellness. *Hellenic Journal of Psychology*, *6*, 107-124.
- Shen, B. (2012). Outside-school physical activity participation and motivation in physical education. *British Journal of Educational Psychology*. Article first published online. doi: 10.1111/bjep.12004
- Standage, M., Gillison, F., & Treasure, D.C. (2007). Self-determination and motivation in physical education. In M. Hagger and N.L.D. Chatzisarantis (Eds.), *Intrinsic*

- Motivation and Self-Determination in Exercise and Sport*, pp.71-85, USA: Human Kinetics.
- Strong, W.B., Malina, R.M., Blimkie, C.J.R., Daniels, S.R., Dishman, R.K., Gutin, B., Hergenroeder, A.C., Must, A., Nixon, P.A., Pivarnik, J.M., Rowland, T., Trost, S., and Trudeau, F. (2005). Evidence based physical activity for school-age youth. *The Journal of Pediatrics*, 146(6), 732-737.
- Sun, H., & Chen, A. (2010). A pedagogical understanding of the self-determination theory in physical education. *Quest*, 62(4), 364-384.
- Tabachnick, B.G., & Fidell, L.S. (2007). *Using multivariate statistics* (5thed.). USA: Pearson International.
- Tappe, M.K., & Burgeson, C.R. (2004). Physical education: A cornerstone for physically active lifestyles. *Journal of Teaching in Physical Education*, 23, 281-299.
- Taylor, I.M., & Lonsdale, C. (2010). Cultural differences in the relationships among autonomy support, psychological need satisfaction, subjective vitality, and effort in British and Chinese physical education. *Journal of Sport & Exercise Psychology*, 32, 655-673.
- Telama, R., Yang, X., Hirvensalo, M., & Raitakari, O. (2006). Participation in organized youth sport as a predictor of adult physical activity: a 21-year longitudinal study. *Pediatric Exercise Science*, 17, 76-88.
- Trudeau, F., & Sheppard, R.J. (2008). Physical education, school physical activity, school sports, and academic performance. *International Journal of Behavioral Nutrition and Physical Activity*, 5(10). doi:10.1186/1479-5868-5-10
- Tudor-Locke, C., Ainsworth, B.E., Adair, L.S., & Popkin, B.M. (2003). Physical activity in Filipino youth: the Cebu longitudinal health and nutrition survey. *International Journal of Obesity*, 27, 181-190.
- UNESCO (2009). Secondary education regional information base: country profile - Philippines. Retrieved on 8 April 2013 from <http://www.uis.unesco.org/Library/Documents/Philippines.pdf>
- UNESCO (2011). World data on education: Philippines. Retrieved on 8 April 2013 from <http://unesdoc.unesco.org/images/0019/001931/193188e.pdf>

- Van de Vijver, F., & Leung, K. (1997). *Methods and Data Analysis for Cross-Cultural Research*. London: SAGE Publications.
- Vallerand, R.J. (2000). Deci and Ryan's Self-Determination Theory: A View from the Hierarchical Model of Intrinsic and Extrinsic Motivation. *Psychological Inquiry*, 11(4), 312-318.
- Viira, R., & Koka, A. (2012). Participation in afterschool sport: relationship to perceived need support, need satisfaction, and motivation in physical education. *Kinesiology*, 44(2), 199-208.
- Vlachopoulos, S.P. (2012). The role of self-determination theory variables in predicting middle school students' subjective vitality in physical education. *Hellenic Journal of Psychology*, 9, 179-204.
- Vlachopoulos, S.P., & Karavani, E. (2009). Psychological needs and subjective vitality in exercise: A cross-gender situational test of the needs univesality hypothesis. *Hellenic Journal of Psychology*, 6, 207-222.
- Vlachopoulos, S.P., Katartzi, E.S., & Kontou, M.G. (2011). The basic psychological needs in physical education scale. *Journal of Teaching in Physical Education*, 30, 263-280.
- Vlachopoulos, S.P., & Michailidou, S. (2006). Development and initial validation of a measure of autonomy, competence, and relatedness in exercise: the basic psychological needs in exercise scale. *Measurement in Physical Education and Exercise Science*, 10(3), 179-201.
- Vlachopoulos, S.P., Ntoumanis, N., & Smith, A.L. (2010). The basic psychological needs in exercise scale: Translation and evidence for cross-cultural validity. *International Journal of Sport and Exercise Psychology*, 8, 394-412.
- Wang, C.K.J., Hagger, M., & Liu, W.C. (2009). A cross-cultural validation of perceived locus of causality scale in physical education context. *Research Quarterly for Exercise and Sport*, 80(2), 313-325.
- Watkins, M. W. (2000). *Monte carlo PCA for parallel analysis* [computer software]. State College, PA: Ed & Psych Associates.

- Williams, G.C., Grow, V.M., Freedman, Z.R., Ryan, R.M., & Deci, E.L. (1996).
Motivational predictors of weight loss and weight-loss maintenance. *Journal of Personality and Social Psychology*, 70, 115-126.
- Wilson, P.M., Mack, D.E., & Grattan, K.P. (2008). Understanding motivation for exercise: A self-determination theory perspective. *Canadian Psychology*, 49(3), 250-256.
- de Winter, J.C.F., & Dodou, D. (2012). Factor recovery by principal axis factoring and maximum likelihood factor analysis as a function of factor pattern and sample size. *Journal of Applied Statistics*, 39(4), 695-710.
- Yang, X., Telama, R., Hirvensalo, M., Viikari, J.S.A., & Raitakari, O.T. (2009). Sustained participation in youth sport decreases metabolic syndrome in adulthood. *International Journal of Obesity*. Advance online publication.
doi:10.1038/ijo.2009.17
- Yang, X., Telama, R., Hirvensalo, M., Hintsanen, M., Hintsanen, T., Pulkki-Raback, L.,... Raitakari, O.T. (2010). Sustained involvement in youth sports activities predicts reduced chronic job strain in early midlife. *Journal of Occupational and Environmental Medicine*, 52(12), 1154-1159.

APPENDIX A. Research Questionnaire

Control No. _____

Dear student,

Ako ay isang master's degree student sa sport and exercise psychology at kasalukuyang pinag-aaralan ang motivation ng mga estudyante sa physical education (PE). Ang purpose ng pag-aaral na ito ay isalin sa Filipino at subukin ang bisa ng Basic Psychological Needs in Physical Education Scale. Bohuntaryo ang iyong partisipasyon sa pag-aaral na ito. Hindi mo kailangang isulat ang iyong pangalan sa papel na ito kaya mananatili kang anonymous. Ang mga sagot mo sa questionnaire na ito ay hindi rin magiging basehan ng iyong galing sa klase kaya hindi ito makakaapekto sa iyong grado. Mangyari lamang na sagutan ang mga tanong ng buong katapatan.

Mga sampung (10) minuto lamang ang kinakailangan upang masagot ang survey na ito. Kung gusto mong sumali sa survey, sagutan lamang ang mga sumusunod na mga tanong. Kung hindi mo gustong sumali, pakibalik lang ang questionnaire na ito sa akin na walang marka o sulat.

Lubos na nagpapasalamat,

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 European Master in Sport and Exercise Psychology
 University of Jyväskylä, Finland

Part A. Maaari lamang na sagutan ang mga sumusunod. Isulat sa linya o lagyan ng (x) ang iyong sagot.

1. Edad: _____ taong gulang
2. Kasarian: () Lalaki () Babae
3. Taon: () 1st Year () 2nd Year () 3rd Year () 4th Year
4. Section: _____
5. Uri ng Paaralan: () Public () Private
6. Nationalidad: () Filipino () Others: _____
7. Pangunahing lengguwahe o lengguwaheng ginagamit sa pang-araw-araw na pagsasalita:

8. Kasalukuyan ka bang nakikilahok sa mga "out-of-school or extra-curricular sports"? () Oo () Hindi
 Kung oo, anu-ano ang mga sports na ito?

9. Gaano ka kadalas na karaniwang lumalahok sa mga "out-of-school or extra-curricular sports" na ito?
 _____ beses bawat linggo
10. Gaano ka katagal na karaniwang lumalahok sa mga "out-of-school or extra-curricular sports" na ito?
 _____ minutos bawat lahoc
11. Tangkad: _____ ft _____ in OR _____ cm
12. Timbang: _____ lbs OR _____ kg

Part B. Paano mo nakikita ang iyong PE teacher?		<i>Hinding-hindi sumasang-ayon</i>			<i>Walang pinapanigan</i>		<i>Lubos na Sumasang-ayon</i>	
1	Sa tingin ko ay pinapayagan ako ng aking PE teacher na mamili ng paraan ng paggawa ng mga bagay-bagay.	1	2	3	4	5	6	7
2	Sa tingin ko ay naiintindihan ako ng aking PE teacher.	1	2	3	4	5	6	7
3	Nagpapahiwatig ang PE teacher ko ng kanyang pagtitiwala sa kakayahan kong maging magaling sa PE.	1	2	3	4	5	6	7
4	Hinihikayat ako ng aking PE teacher na magtanong.	1	2	3	4	5	6	7
5	Pinakikinggan ng PE teacher ko kung paano ko gustong gawin ang mga gawain.	1	2	3	4	5	6	7
6	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.	1	2	3	4	5	6	7
Part C. Gaano ka sumasang-ayon sa mga sumusunod na pahayag? Bilugan ang numerong nagpapahiwatig ng iyong pagsang-ayon. Isang numero lang ang maaaring bilugan sa bawat pahayag.		<i>Hinding-hindi ako sumasang-ayon</i>			<i>Sang-ayon ako</i>		<i>Lubos akong sumasang-ayon</i>	
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.	1	2	3	4	5	6	7
2	Sa PE, maayos ang pakikitungo ko sa aking mga kaklase.	1	2	3	4	5	6	7
3	Sa PE, ginagawa namin ang mga bagay na interesado ako.	1	2	3	4	5	6	7
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.	1	2	3	4	5	6	7
5	Sa PE, pakiramdam ko'y may malapit na pagsasamahan kami ng aking mga kaklase.	1	2	3	4	5	6	7
6	Sa tingin ko ay itinuturo ang PE sa paraan na gusto ko.	1	2	3	4	5	6	7
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.	1	2	3	4	5	6	7
8	Sa PE, pakiramdam ko ay isa akong mahalagang miyembro ng isang barkada.	1	2	3	4	5	6	7
9	Sa PE, pakiramdam ko na ang mga klase ay tunay na nagpapahayag ng pagkatao ko.	1	2	3	4	5	6	7
10	Sa PE, napagtatagumpayan ko ang mga gawain kahit na nahihirapan dito ang karamihan.	1	2	3	4	5	6	7
11	Sa PE, sa tingin ko ay nabibilang ako sa isang malaking barkada.	1	2	3	4	5	6	7
12	Pakiramdam ko ay ako ang pumili ng mga activities namin sa PE.	1	2	3	4	5	6	7
Part D. Paano ang iyong pakiramdam sa PE?		<i>Hindi totoo</i>			<i>Totoong-totoo</i>			
1	Sa PE, buhay na buhay at masigla ang nararamdaman ko.	1	2	3	4	5	6	7
2	Sa PE, wala akong masyadong sigla o gana.	1	2	3	4	5	6	7
3	Sa PE, minsan masyado akong buhay na buhay na parang gusto kong tumalon-talon.	1	2	3	4	5	6	7
4	Sa PE, mayroon akong lakas at sigla.	1	2	3	4	5	6	7
5	Sa PE, lagi akong excited sa bawat bagong aralin.	1	2	3	4	5	6	7
6	Sa PE, halos palagi kong nararamdaman na ako'y gising at alisto.	1	2	3	4	5	6	7
7	Sa PE, parang nabigyan ako ng panibagong sigla.	1	2	3	4	5	6	7

Maraming salamat sa iyong partisipasyon.

APPENDIX B. Letter of Request to Conduct Research

Subject: Permission to Conduct Research Study

Dear _____:

I am writing to request permission to conduct a research study in your institution. I am currently a student in the European Master in Sports and Exercise program of the University of Jyväskylä (Finland) with an Erasmus Mundus Category A scholarship. I am conducting a study on the validity and reliability of the Basic Psychological Needs in Physical Education Scale (BPN-PE: Vlachopoulos, Katartzi, & Kontou, 2011) in Filipino. The main objective of this study is to translate into Filipino the BPN-PE and to evaluate its psychometric properties. Attached is the abstract of this study (Appendix A).

I hope that Your Office will allow me to recruit at least 150 high school students from 12 to 16 age group to anonymously complete a two-page questionnaire (Appendix B). If approval is granted, students who will participate in the survey will be asked to complete the questionnaire in a classroom or other quiet setting on campus site on the day that they have Physical Education class. The survey process should take no longer than 10 minutes to complete.

The data gathered will be pooled for the research project and results of this study will remain absolutely confidential and anonymous. Should this study be published, only pooled results will be documented and a copy of the published material shall be sent to your office. By participating in this study, your Institution, and the individual participants shall not incur any cost.

Your approval to conduct this study will be greatly appreciated. I will follow up with a telephone call within the week and would be happy to answer any questions or concerns that you may have at that time. You may contact me at my email address: jonathan.2.cagas@student.jyu.fi.

If you agree, kindly sign below or kindly provide a signed letter of permission on your institution's letterhead, acknowledging your consent and permission for me to conduct this study.

Sincerely,

Jonathan Cagas
 European Master in Sports and Exercise Psychology 2011-2013
 University of Jyväskylä
<https://www.jyu.fi/sport/en/study/programmes/emsep>

APPENDIX C. Factor Loadings and Communalities Table

Table 5. *Factor Loadings and Communalities of PAF with Oblimin Rotation*

Items	Factor 1 Relatedness	Factor 2 Competence	Factor 3 Autonomy	h^2
Item 3. <i>Sa PE, ginagawa namin ang mga bagay na interesado ako.</i>		-.419		.325
Item 6. <i>Sa tingin ko ay itinuturo ang PE sa paraan na gusto ko.</i>			.549	.339
Item 9. <i>Sa PE, pakiramdam ko na ang mga klase ay tunay na nagpapahayag ng pagkatao ko.</i>	.512			.441
Item 12. <i>Pakiramdam ko ay ako ang pumili ng mga activities namin sa PE.</i>			.703	.349
Item 1. <i>Sa PE, sa tingin ko ay nagiging mas mahusay ako kahit sa mga gawain na itinuturing na mahirap ng karamihan ng aking mga kaklase.</i>		-.719		.408
Item 4. <i>Sa PE, sa tingin ko ay nagagawa ko nang tama kahit ang mga gawain na itinuturing na mahirap ng karamihan ng aking mga kaklase.</i>		-.656		.492
Item 7. <i>Sa PE, sa tingin ko'y nagagawa ko nang mahusay kahit ang mga gawain na itinuturing na mahirap ng karamihan ng aking mga kaklase.</i>		-.766		.554
Item 10. <i>Sa PE, napagtatagumpayan</i>		-.602		.464

ko ang mga gawain kahit na nahihirapan dito ang karamihan.

Item 2. Sa PE, maayos ang pakikitungo ko sa aking mga kaklase.	.533	.335
Item 5. Sa PE, pakiramdam ko'y may malapit na pagsasamahan kami ng aking mga kaklase.	.498	.378
Item 8. Sa PE, pakiramdam ko ay isa akong mahalagang miyembro ng isang barkada.	.746	.485
Item 11. Sa PE, sa tingin ko ay nabibilang ako sa isang malaking barkada.	.754	.468
