

Selection of Appropriate Chinese Terms to Represent Intensity and Types of Physical Activity Terms for Use in the Taiwan Version of IPAQ

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ABSTRACT: In order to analyze the health risks of insufficient activity by international comparisons, the first author obtained the permission to translate and develop a Taiwan version of the International Physical Activity Questionnaire (IPAQ). The objective was to determine culturally sensitive Chinese translations for the terms “moderate”, “vigorous” and “physical activity” as well as to identify representative types of physical activity for Taiwanese. This study used discussions by 12 expert focus groups, 6 expert audits, a scale survey, field study, Cognitive Aspect Survey Methodology (CASM), dual independent translation and back-translation to establish a consensus on physical activity-related concepts, terminologies and types that define the intensity of common activities of Taiwanese by integrating both local and foreign studies. The Chinese terms “*fei li*”, “*zhong deng fei li*” and “*shen ti huo dong*”, respectively, were identified as suitable and adequate translations for the English terms “vigorous”, “moderate” and “physical activity”. The common Taiwanese activities were accurately categorized and listed in questionnaires, forming culturally sensitive scales. Taiwan versions of IPAQ’s self-administered long version (SL), self-administered short version (SS), and telephone interview short version (TS) were developed. Their content validity indices were .992, .994, and .980, as well as .994, .992, and .994 for language equivalence and meaning similarity between the English and Chinese versions of the IPAQ-LS, IPAQ-SS, and IPAQ-TS, respectively. Consistency values for the English and Chinese versions in terms of intraclass correlation coefficients were .945, .704, and .894, respectively. The IPAQ-Taiwan is not only a sensitive and precise tool, but also shows the effectiveness of the methodology (CASM) used in tool development. Subjects who did not regularly exercise and had an education less than a junior high school level underestimated the moderate-intensity physical activity.

Key Words: International Physical Activity Questionnaire (IPAQ), Taiwan, Cognitive Aspect Survey Methodology (CASM), vigorous, moderate.

Introduction

Risks associated with insufficient activity on people’s health in developed countries have received worldwide attention. In the United States, physical inactivity is second only to smoking in influencing health (United States

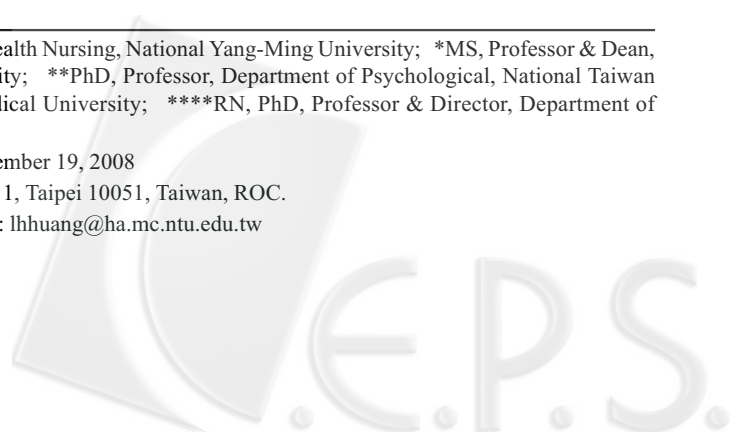
Department of Health and Human Services, USDHHS, 1996). Academics from around the world met at the World Health Organization (WHO) and resolved to develop a universal method to measure physical activity (PA), carry out international comparisons, and search for preventive measures (Booth, 2000). An international consensus group

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developed the International Physical Activity Questionnaire (IPAQ), which covers a person's record of physical activity for a period of seven days and includes four versions, self-administered long (SL) and short versions (SS), as well as telephone interview short (TS) and long versions. It was expected that, with the use of the IPAQ, an international analysis could identify the prevalence of insufficient activity.

Physical activity is characterized differently in each country, however, and is influenced greatly by culture. Americans, for example, may prefer going to the gym to work up a sweat. Chinese place more importance on maintaining health through exercise and emphasize deep breathing, while in India yoga integrates religion and philosophy. It is therefore difficult to find sufficiently universal types of physical activity for incorporation in the questionnaire for international comparison.

According to 1990 recommendations by the American Association of Sport and Medicine (ACSM), continuous aerobic exercise for 20 minutes more than three times a week, with an intensity of 60–90% maximal heart rate or 50–85% maximal aerobic capacity, can enhance cardiopulmonary function. Although this recommendation has been promoted for many years, the number of Americans who do not exercise did not decrease. In 1995, in an effort to decrease chronic disease risk factors, the American National Center for Chronic Disease Prevention and Health Promotion (CDC) suggested that the intensity of PA be maintained at a moderate level, that activity duration increase to over 30 minutes per day, and that PA be done more than five days per week. It was also suggested that PA be done for at least 150 minutes per week at or above a brisk walking intensity. This type of PA has already shown sufficient positive effects in preventing chronic disease (Lee & Paffenbarger, 2000). It is obvious that activity intensity is the determinant of PA effectiveness, which is why the IPAQ adopted the following classification standard as elements of the questionnaires: *vigorous-intensity physical activity*, defined as activity at more than 6 metabolic equivalents (METs) with even greater benefits to cardiopulmonary endurance, and *moderate-intensity physical activity*, defined as activity at 3–6 METs with a preventive effect on chronic disease if carried out sufficiently. The IPAQ uses the perceived effort level, breathing status, and limited activities such as heavy lifting, digging, aerobics, and fast cycling to describe vigorous activity; carrying light loads, cycling at a regular pace, and doubles

tennis are activities used to describe moderate activity. Rzewnicki, Auweele, & de Bourdeaudhuij (2003) had subjects fill out the IPAQ-SS version, after which they tracked PA intensity and duration with follow-up questions. Results showed that subjects who normally did not exercise found it more difficult to understand the correlation between breathing changes and PA intensity, which is why 40% of all subjects overestimated vigorous and moderate activity, and two-thirds overestimated the PA of walking. Therefore, such misunderstandings may be reduced if a cultural distinction can be determined and examples can be found of common PA measurements (in work, transportation, housework, and leisure activities) in Taiwan. The investigators therefore searched for suitable, corresponding Chinese translations for the activity intensity terms in the IPAQ and selected representative physical activities to act as examples in the questionnaire, with the expectation that a Taiwan-Chinese version of IPAQ could be developed that could be used locally and that results would be valid for use in comparison with results from other countries.

Concept equivalence must be emphasized when developing a Chinese version of the PA questionnaire. In other words, people must have the same perception of activity-related terms and intensity. This includes (IPAQ, n.d.).

1. Measurement equivalence: one concept may be formulated differently. Confirming activity intensity is especially important, and it must be established that moderate intensity describes an activity which is performed at 3–6 METs, and vigorous intensity an activity performed at more than 6 METs.
2. Language correspondence: during the translation process, language correspondence must be ensured in order that people of different cultures interpret the same meaning for the same activity. After translation, meaning consistency is more important than language consistency.
3. Cultural adaptation: IPAQ allows some differences between cultures and languages in order to enable smooth and natural wording in different language versions. Nevertheless, the interpretation must remain consistent.

When a questionnaire in a specific language is to be used in another culture, it must not only be translated, but also be adapted to be in harmony with that culture (Sperber,

Devellis, & Boehlecke, 1994). van de Vijver and Hambleton (1996) reported that when the investigator knows that his translation will be back-translated, he/she will often use accurate wording so that it will be back-translated into the same words as the original language, instead of choosing words that are actually more suitable in local situations. This means that when back-translation is done, replacing inappropriate terms with terms that are more meaningful and suitable in a specific culture is often not done. Some academics, therefore, suggest that, rather than insisting on certain words, greater importance should be placed on conveyance of the same meaning. A standard method for this process was reported by Geisinger in 1994, which included 1. implement translation and adaptation; 2. conduct pre-test; 3. conduct pilot study; 4. confirm score standardization; 5. test for effective reliability and validity testing in order to ensure that (1) both versions of the questionnaire are of good quality and (2) changes in test type, instructions, questionnaire content, or language used are tested again for reliability and validity (in accordance with American Educational Research Association stipulations; 6. develop a questionnaire handbook; 7. conduct user training and 8. collect user responses.

Investigators had three objectives for this study.

1. Establish a consensus with regard to concept, wording and itemization of common PA in Taiwan.
2. Review relevant local and international studies to define common types of activity intensity in Taiwan.
3. Develop three IPAQs suited to local use.

Methods

This study focused on the development of a Chinese questionnaire. Due to differences in PA and intensity in different cultures and in view of generally insufficient PA among Taiwanese, this study adopted more elaborate procedures than required internationally (Geisinger, 1994) as shown in Figure 1.

Research Procedures

1. Expert focus groups and expert audit. The first step in this study was to find Chinese words that fit the definition of “3–6 METs” and “greater than 6 METs”, and also corresponded with the expressions “moderate physical activity (MPA)”, “vigorous physical activity (VPA)” as well as physical activity. The investigators made a list of synonyms for both expressions and then

searched for Chinese and English translations for all of these synonyms, generating a word database. Then, experts in this field discussed the Chinese translations for the different PA intensities, and also considered Taiwanese and Hakka language translations. Several Chinese translations of the questionnaires were conducted.

2. Field study: Subjects came from the community and were invited to select the best Chinese translations for PA, MPA, and VPA.
3. Pre-testing: After we included Chinese translations of PA, MPA, and VPA in the IPAQ, the same subjects were invited back to check questionnaire wording and clarity as well as subject responses. It used structured questionnaires (was it easy to understand, was it clear enough, were there any wrong words, were there any problems?) and interviews to obtain a response from subjects with regard to the IPAQ and related wording.
4. Cognitive Aspect Survey Methodology (CASM) was used to understand how a subject comprehends each question as well as the rethinking strategies and judgment and thinking processes used to obtain and change answers (Jobe & Mingay, 1990). Thinking aloud, verbal protocols and cross-questioning were applied to obtain answers to the above questions (Sudman, Bradburn, & Schwarz, 1996).
5. Systemic literature review: A wide-ranging search of the literature, websites, and expert discussions was conducted to identify local types of PA in order to cite more examples which precisely categorized the terms “moderate” and “vigorous” as well as determine the intensity of local PA types in order to classify common types of physical activities in Taiwan.
6. Translation, back translation, and adaptation suggestions by the IPAQ developmental team. The original English version was translated independently by two experts proficient in both English and Chinese into two Chinese versions, 1A and 1B (Figure 1). Then, two people who had lived in an English-speaking country for more than four years (Sperber et al., 1994) were asked to independently back-translate these two Chinese versions into English. The five versions (i.e., the original English, two Chinese, and two back-translated English versions) were outlined on one form to facilitate comparison by experts.
7. Expert focus groups and expert audit. An expert panel reviewed the Chinese text and provided suggestions.

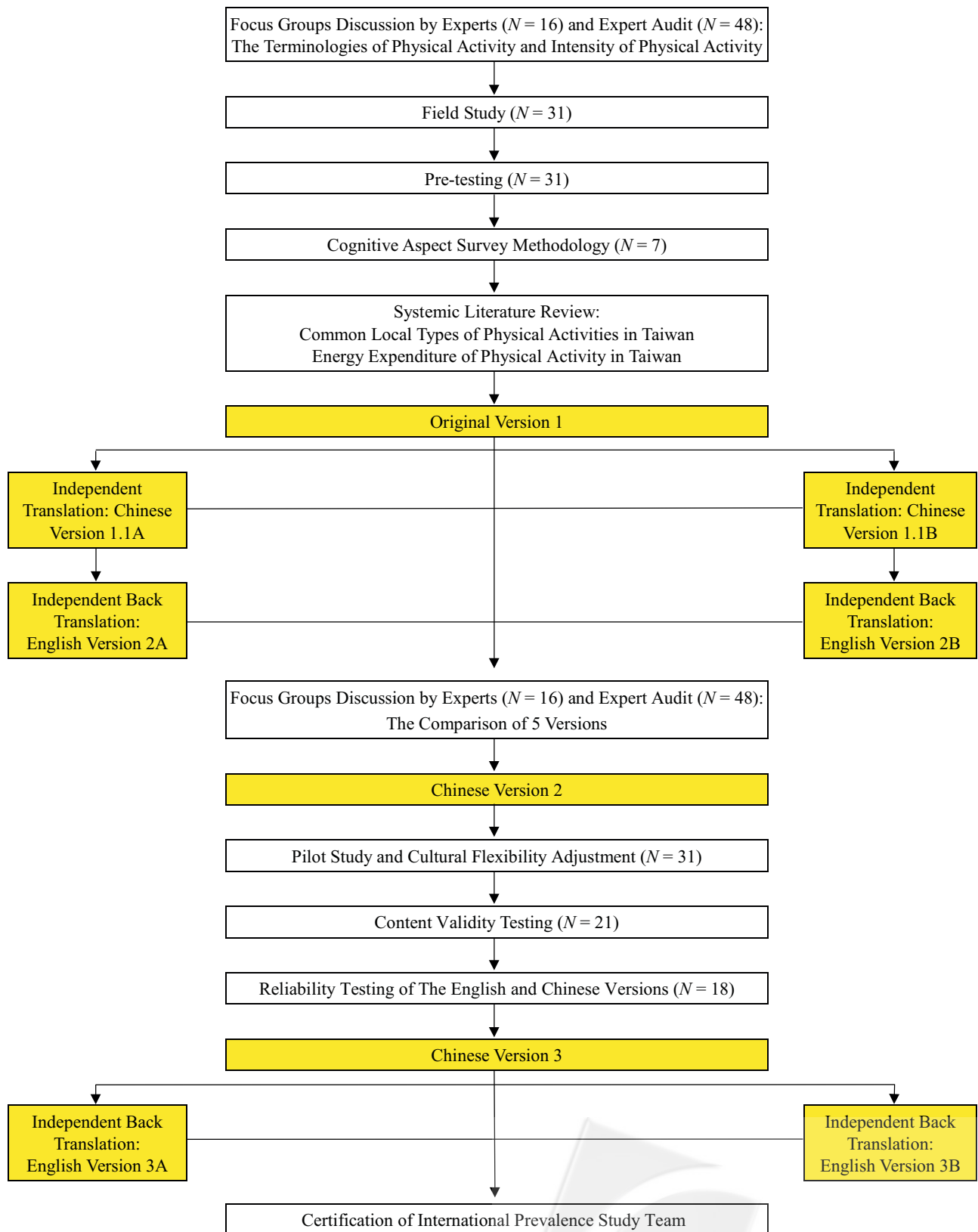
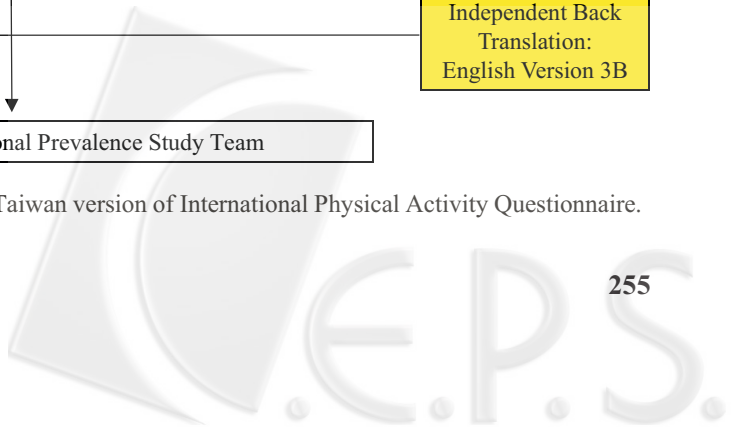


Figure 1. The flowchart of development and verification of Taiwan version of International Physical Activity Questionnaire.



They then compared such with the original text to ensure that wording is comparable between the two and acceptable in different cultural settings. When the translation was done from English into Chinese, words must sometimes be changed in order to maintain the same meaning. However, it must be ensured that all underlying concepts of the word remain intact after translation. Any example of PA must be easily understood within Taiwan's cultural context. Every item must be discussed repeatedly and word by word, so that translated words, concepts and meanings can reach standards of adequacy and equivalence as well as conform to local cultural expectations.

8. Pilot study and cultural flexibility adjustment: Subjects were asked to fill out the questionnaire and discuss the questionnaire item by item (how was the wording, was it clear enough, were there any problems, what was the overall impression, were there any questions that made the subject feel uncomfortable, were any activities left out that the subject felt important).
9. Testing of content validity: Experts were asked to give scores from 1 to 7 (1 being the best score and 7 the worst) to test meaning similarity and linguistic equivalence between the different language versions.
10. Reliability testing of the English and Chinese versions: To test consistency between the original English version and Chinese versions, experts were first asked to fill out the Chinese questionnaire, and then, without seeing the answers given, fill out the English questionnaire.
11. Back translation: Two people who had lived in an English-speaking country for more than four years and had not had previous experience with IPAQ were asked to back-translate these two Chinese versions into English independently.
12. Final results were sent back to the International Prevalence Study (IPS) team for certification.

Subjects

Criteria for subjects in the field study included the following: household registry in Taipei, 18–65 (37.8 ± 5.2) years old, able to communicate in Chinese, and able to answer questions and fill out a institutional review board-approved questionnaire. A total of 31 subjects were recruited and signed consent forms. Subjects were of varying educational levels (below or equal to middle high school, and above senior high school) and PA participant levels (no PA, middle

level, or high level: those who met the recommendations of ACSM-1990 or CDC-1995 as mentioned above).

A group of 48 experts in the fields of sports, medicine, nursing, rehabilitation, psychometrics, epidemiology, and public health who had published relevant studies and earned master's or higher degrees were asked to examine content validity, linguistic equivalence and meaning similarity of the Taiwan version of the IPAQ. Another 18 experts proficient in both Chinese and English were requested to fill out both English and Chinese versions of the IPAQ to obtain an agreement score.

Data Analysis

Data were analyzed using SPSS 12.0 for Windows for descriptive analysis. The content validity index (CVI) was used to examine the language equivalence and meaning similarity. The CVI is the coefficient derived by dividing the sum of all "five to seven" ratings by the total number of items in the subscale. Intraclass correlation coefficient (ICC) was used to analyze the consistency of English and Chinese versions.

Results

Choosing a Chinese Translation for the English Term "Physical Activity Intensity"

Three Chinese words (*shen ti huo dong*, *fei li*, and *qing kuai*) were chosen to represent the English words "physical activity", "vigorous", and "moderate" by experts. Other words that could be considered are also shown in Table 1.

In a field survey, the 31 subjects chose which word they found best described PA, vigorous and moderate when given the definitions for these three terms. Results showed a preference for the Chinese translations "*shen ti huo dong*", "*fei li*", and "*qing kuai*". These results mirrored the choices made by the experts.

In the interview stage, there was a strong response that the questionnaire included too many specialist terms that could not be remembered. As a result, they repeatedly had to ask for the distinction between vigorous and moderate.

The Cognitive Aspect Survey Methodology was applied, with subjects asked to think out loud or use verbal protocol and to voice their thoughts on hearing the word "*qing kuai*" physical activity. One subject said he thought of moving softly through the house in the early morning when families were still asleep. One female subject said

Table 1.
Chinese Translation Preferences for the Terms “Physical Activity”, “Vigorous”, and “Moderate”

Item	n	%
Physical Activity		
<i>shen ti huo dong</i> (身體活動)	12	41.4
<i>ti li huo dong</i> (體力活動)	10	34.5
<i>ti neng huo dong</i> (體能活動)	7	24.1
Total	29	100.0
Missing	2	
Vigorous		
<i>ji lei</i> (激烈)	8	27.6
<i>fei li</i> (費力)	10	34.5
<i>chu li</i> (出力)	3	10.3
<i>hua da liang ti li</i> (花大量體力)	5	17.2
<i>huo po</i> (活潑)	3	10.3
Total	29	100.0
Missing	2	
Moderate		
<i>zhong deng fei li</i> (中等費力)	10	33.3
<i>qing kuai</i> (輕快)	15	50.0
<i>hua ti li</i> (花體力)	5	16.7
Total	30	100.0
Missing	1	

she thought of gently stretching out her arms and legs. Another subject said he thought of an actor in a movie slowly performing *Tai Chi*. In the first two activities, the intensity of PA did not reach the level of 3 METs and they were, therefore, not in accordance with the basic definition. Subjects were then asked to compare the phrases “quickly walking” and “qing kuai walking”, and results were quite different. The subjects felt that “quickly walking” meant walking fast, while “qing kuai walking” meant just walking. “Qing kuai” therefore apparently does not indicate the typical moderate physical activity of “brisk walking”.

Further analysis showed that most subjects who participated in PA to some extent in their daily lives, but whose PA consisted of irregular moderate activity chose “qing kuai” (Table 2). The investigators were concerned that subjects who did not regularly exercise underestimated the intensity of moderate activity. Most subjects with an education level below junior high school also chose “qing kuai” (Table 3). When subjects were asked why they chose “qing kuai”, some said “because that’s what we usually call it”.

“Zhong deng fei li” was the second choice for a term comparable with “fei li”, but in this case it was easier to differentiate by intensity. After repeated discussion it was decided to translate “moderate” into “zhong deng fei li”.

Table 2.
Chinese Translations for Vigorous and Moderate Selected by Subjects Who Participate in Various Levels of Physical Activity

Item	Inactivity		Sufficient activity		High activity		Total	
	n	%	n	%	n	%	n	%
Vigorous								
<i>ji lei</i> (激烈)	2	6.9	2	6.9	4	13.8	8	27.6
<i>fei li</i> (費力)	0	0.0	4	13.8	6	20.7	10	34.5
<i>chu li</i> (出力)	0	0.0	2	6.9	1	3.4	3	10.3
<i>hua da liang ti li</i> (花大量體力)	1	3.4	4	13.8	0	0	5	17.2
<i>huo po</i> (活潑)	1	3.4	0	0	2	6.9	3	10.3
Total	4	13.8	12	41.4	13	44.8	29	100
Missing	1		1					
Moderate								
<i>zhong deng fei li</i> (中等費力)	1	3.4	3	10.3	6	20.7	10	34.5
<i>qing kuai</i> (輕快)	2	6.9	7	24.1	6	20.7	15	51.7
<i>hua ti li</i> (花體力)	1	3.4	2	6.9	1	3.4	4	13.8
Total	4	13.8	12	41.4	13	44.8	29	100
Missing	1		1					

Table 3.
Chinese Translation for Vigorous and Moderate by Subjects with Different Educational Levels

Item	Middle high school or below (≤ 9 years)		Senior high school or above (> 9 years)		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Vigorous						
<i>ji lei</i> (激烈)	0	0	8	28.6	8	28.6
<i>fei li</i> (費力)	4	14.3	5	17.9	9	32.1
<i>chu li</i> (出力)	1	3.6	2	7.2	3	10.7
<i>hua da liang ti li</i> (花大量體力)	1	3.6	4	14.2	5	17.9
<i>huo po</i> (活潑)	1	3.6	2	7.2	3	10.7
Total	7	25.0	21	75.0	28	100
Missing	2		1			
Moderate						
<i>zhong deng fei li</i> (中等費力)	1	3.4	9	31.0	10	34.5
<i>qing kuai</i> (輕快)	6	20.7	9	31.0	15	51.7
<i>hua ti li</i> (花體力)	0	0.0	4	13.8	4	13.8
Total	7	24.1	22	75.9	29	100
Missing	1		1			

Common Types of Physical Activity Among Taiwanese

Reports were collected on common types of PA among various groups of Taiwanese, such as university students (Wang, 2007), women (Chen & Chang, 2004), nurses (Lee, Huang, & Kao, 2005), and police officers (Huang, 2006). These were compared with national representative studies conducted by Chen (2000) and Wen et al. (2007) on exercise in Taiwan. These PAs consisted mainly of leisure activities, and data on PA during work and daily life proved to be insufficient. The database of the Taiwan Council of Labor Affairs with data on labor-related energy expenditure was referred to for additional PA items (Lee & Wu, 1996; Liu, Lu, & Chen, 1994). The data showed that leisure activities among Taiwanese were concentrated on the "watching television" and "walking" items. Exercise focused on mountain climbing, hiking, jogging, swimming, biking, traditional fitness, basketball, badminton, table tennis, and volleyball. These types of PA should therefore be included in the Taiwan version of the IPAQ and listed in order of popularity.

Classification of Common Types of Physical Activity in Taiwan

A PA energy consumption guide by Ainsworth (2002) posted on the website of the University of South Carolina classifies 2,000 types of PA. However, as the basal meta-

bolic rate of Taiwanese is generally lower than that of Caucasians (Lin, Wang, & Wu, 2005; Wai, 2000), data on PA energy consumption in Taiwanese needed to be compared. PA energy consumption in Taiwanese may be divided into the following categories:

1. Work: reference was made to the study on labor-related energy expenditure by the Institute of Occupational Safety and Health (2008).
2. Daily physical activity: reference was made to an overview of PA levels made by Lin et al. (2005). However, there remained a lack of data on energy consumption for many different types of PA. We therefore consulted individual studies on PA energy consumption, including walking (Lin, Lin, & Wang, 1995), *Tai Chi* (Chen et al., 2007), *Waitan kungfu* (Wu, 2003), swimming (Yao, 1994), and aerobics (Wu & Chiou, 2004).

There were still many types of PA for which no data on intensity were available. The first author addressed this issue during the IPAQ discussion at the annual meeting of the ACSM. Dr. James F. Sallis and Adrian Bauman suggested using expert judgment to classify PAs for which no data were yet available. *Yuanji* dance, for example, was determined by experts to be similar to *Waidan kungfu* for which data were available. *Yuanji* dance, therefore, was classified as a light activity.

Energy consumption during walking is related closely to weight carried during walking. As Taiwanese are not familiar with the metric unit kilogram, the *Taijin*, a Taiwanese weight measure equaling about 600 grams, was used to give examples of loads experienced by people with different lifestyles, such as housewives, office staff, students, male subjects, and construction workers. MPA was thus defined as walking with a load of 7.5 to 15 *Taijin*, or 4.5 to 9 kilograms. Clear examples were given for that weight range.

Translation and Back-Translation of the Questionnaire

We followed the procedure noted above to obtain two Chinese versions and two back-translated English versions of the questionnaire.

Pilot Study and Cultural Flexibility Adjustment

A good response was obtained during this process, and many problems were carefully deliberated. Some subjects, for example, indicated that the daily chore of throwing out the garbage was omitted. Elaborate analysis of the path, action and burden of garbage removal however, showed that, although throwing away newspapers required strenuous effort, the load was carried for less than ten minutes due to the fact that the objects were placed on the ground while waiting for the garbage truck. Garbage duty was, therefore, not a suitable example of moderate activity.

When the first draft was completed, it was sent to experts for review. If a response was found to be important, earlier versions were also adjusted. After categorization of expert suggestions, an expert meeting was convened to clarify dubious interpretations. A period of ten months passed before the final versions of the three Chinese versions were completed.

Testing for Content Validity

After 12 expert meetings and 6 written expert reviews, CVI scores for the IPAQ-LS, IPAQ-SS, IPAQ-TS were .992, .994, and .980, and .994, .992, and .994 in language equivalence and meaning similarity, respectively. A gradual understanding was obtained for items with a relatively low score, and adjustments were made accordingly.

Reliability Testing of English and Chinese Versions

ICC analysis was performed on scores given by 18 experts. Consistency analysis of the English and Chinese

versions resulted in scores of .945, .704, and .894 for the IPAQ-LS, IPAQ-SS, IPAQ-TS, respectively. This indicated good consistency between English and Chinese versions of the three questionnaires.

Certification by the International Prevalence Study (IPS) Team

The three Chinese versions were independently translated by two professional translators into two English versions: 3A and 3B. These, together with the three Chinese versions, were sent to the IPAQ consensus committee development team for verification.

IPAQ: self-administered short version

This version, filled out by each subject, was aimed at understanding how much time (the average each day for how many days over the past seven days) the subject spent on vigorous activity, moderate activity, and walking. The subject was also asked how much time at work was spent sitting in weekday. In the original IPAQ, vigorous physical activities were described as activities that take hard physical effort and make you breathe much harder than normal and moderate physical activities were described as activities that take moderate physical effort and make you breathe somewhat harder than normal. Examples of such were limited, with many differences between conditions in different countries. Few Taiwanese shovel snow or chop wood, for example, while *Tai Chi* and *Yuanji* dance are not found on non-Taiwanese versions. In Taiwan, due to a lack of barrier-free facilities, pushing a baby buggy is a relatively uncommon activity. Children in buggies are also relatively young, and as soon as they become older, they are encouraged by their parents to walk. When they get tired, they are carried. Therefore, pushing a baby buggy was not included as an MPA in Taiwan and not included in the questionnaire. Examples of VPA given in the Taiwan-Chinese version included jogging, running, hill/mountain climbing, stair walking, fast biking, aerobic dance/exercise, fast continuous swimming (not including slow swimming, water play, or soaking), playing tennis (singles), playing basketball, playing football, shoveling soil, and moving objects heavier than 10 kg. Any activity with an intensity similar to that of jogging and performed for more than ten minutes could be included. These activities should increase the heart rate, result in heavier breathing, and cause sweating. MPA such as mountain hiking, regular biking, dancing (not including ballroom dancing or slow-

dancing), gymnastics, *Tai Chi* (not including *Waidan kungfu*), playing ball sports (such as doubles tennis, table-tennis, badminton, not including golf or bowling), carrying objects of 7.5–15 *Taijin* (4.5–9 kg) (such as a small watermelon, three whole pineapples, a 5 kg bag of rice, two jugs of family-size milk, two packs of A4 copying paper, 3 bricks, 7 glass bottles of Taiwan Beer or rice wine, or a box of 24 beverage cans) while walking, laborious domestic chores (washing the car, vacuuming, mopping, hand-washing, washing windows, making beds, carrying children), and cleaning the yard. These activities require effort and breathing becomes a little heavier than usual. Any activity with an intensity similar to that of brisk walking and performed for more than ten minutes could be included. As the questionnaire consisted of only 7 items and was, therefore, rather concise, it was suitable for use in a large-scale survey of PA among Taiwanese. Questionnaires took 4 to 15 minutes to complete, with a mean of 5.2 minutes.

IPAQ: self-administered long version

This version, also filled out by the subject, was aimed at understanding how much time the subject spent on VPA, MPA, and walking, at work, in the household, and in transportation and leisure activities. The subject was also asked how much time during weekdays and weekends was spent sitting. There were 26 question items. This version is suited for a complete study of daily PA habits as well as an evaluation tool used prior to activity intervention. It can also form an outcome index. The time required to fill out the IPAQ was 7 to 21 minutes, with a mean of 12.2 minutes.

IPAQ: telephone interview short version

This version is almost the same as the self-administered short version, with the exception that case data is obtained via a telephone interview. Clarifying introductions were therefore offered as above. There were 11 question items. This version is even more suited to large-scale surveys of physical activity among Taiwanese. Time required to complete this version was 8 to 23 minutes, with a mean of 9.4 minutes.

Discussion

After 12 expert focus group meetings, 6 written reviews, and in-depth interviews with the subjects, the Chinese words “*fei li*” and “*zhong deng fei li*” were chosen to

describe the English words for “vigorous” and “moderate” PA intensity, respectively. These words are comparable and can indicate the degree of energy consumption. Furthermore, they lack the negative impressions associated with the Chinese words “*ju lie*” and “*chong du*”, which are also found used in local studies. After the development process and in actual study, it was clear that these two Chinese words were most suitable. After regular discussion with experts, a consensus was reached among local scholars in the field, which was an extra contribution of this study.

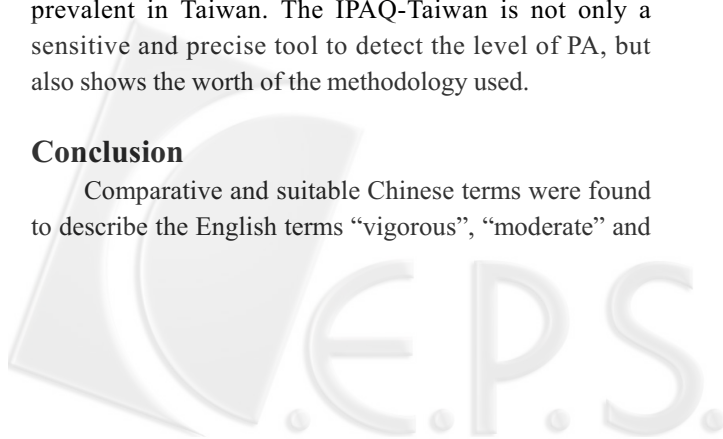
The original IPAQ used only self-perceived intensity and changes in breathing to describe intensity. Rzewnicki et al. (2003) found that people who do not exercise have difficulty understanding heavy breathing. Mäder, Martin, Schutz, and Marti (2006) discovered that VPA is over-reported. This study provided many examples of common PA actually performed by Taiwanese in their daily lives, which was helpful to understand the classification of PA and give correct answers.

After an in-depth study of the literature, types of PA already studied in Taiwan were categorized on the basis of intensity. Relevant studies must be closely monitored in the future to include more types of PA.

Some studies found that different races and ethnic groups respond differently to PA measurements. Ainsworth, Irwin, Addy, Whitt, and Stolarczyk (1999) reported that the ratio of American Indians and non-Americans who achieved the suggested level of moderate PA by keeping a PA log was higher than that obtained using PA structured questionnaires. Scholars thus emphasize that an understanding must be gained of the response of different ethnic groups to scale wording (Warnecke et al., 1997). This study proved that subjects who did not regularly exercise and had an educational level below junior high school underestimated the intensity of MPA. This study consulted experts and potential users of the questionnaire, and used CASM to correct mistakes made by the majority of subjects. A majority does not necessarily give the best answer. Therefore, investigators established a questionnaire which was adapted to race and location and cultural sensitivities prevalent in Taiwan. The IPAQ-Taiwan is not only a sensitive and precise tool to detect the level of PA, but also shows the worth of the methodology used.

Conclusion

Comparative and suitable Chinese terms were found to describe the English terms “vigorous”, “moderate” and



“physical activity”. These terms were “*fei li*”, “*zhong deng fei li*” and “*shen ti huo dong*”, respectively.

Common types of physical activity in Taiwan were accurately categorized under “moderate” or “vigorous”.

The CVI of the IPAQ for language equivalence and meaning similarity between the Chinese and English versions were excellent. The ICC response consistency between the Chinese and English versions was adequate. Therefore, IPAQ Taiwan’s versions are not only culturally sensitive, but have also been developed successfully from the original version.

Suggestions and Limitations

The development of pediatric and geriatric versions is suggested. As one gets older, relative PA intensity (such as maximum heart rate) and consumed absolute PA intensity (such as METs) are reduced, so an adjustment must be made for activity intensity in the elderly (USDHHS, 1996). The same applies to children. Children and elderly people also participate in activities typical of their age group. When versions of the IPAQ are developed for children and the elderly, investigators should offer more specific types of PA for these two groups that can be accurately measured. Developing a PA version for use with illiterate subjects using pictures is necessary. The use of pictures can also save time. International comparison can also more easily be standardized.

This study did not ask experts to analyze the complete spectrum of IPAQ content (Polit & Beck, 2008). Although the IPAQ includes VPA, MPA, walking and sitting, as well as activities carried out during leisure time, work, transportation and household activity, no mention light physical activity, weight loading, or stretching. Also, activity when sitting at work does not include all types of sedentary behavior in the short version. These represent limitations of this questionnaire.

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國際身體活動量表台灣中文版 — 身體活動強度的 中文詞句及代表活動項目的選擇

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摘要：為了與世界各國共同剖析活動不足對健康的危害，第一作者已獲授權對國際身體活動量表的台灣中文版進行翻譯及發展使用，開發一套以費力、中等費力活動量為體，以台灣常見身體活動為用的量表。以十二次專家焦點團體討論、六次書面審查、問卷調查、田野調查、認知觀點調查法及二回合雙重獨立翻譯及回翻，建立國人身體活動相關概念、用語及項目的共識；整合國內外相關研究，定義國人常見的活動強度；發展本土適用的量表。本研究結果為 vigorous、moderate 及 physical activity 找到相對、合適的中文詞彙：費力、中等費力、身體活動；將國人常見活動項目正確歸類，放入量表；繼而發展出國際身體活動量表台灣中文版的自填長版、自填短版、電訪短版。三量表中英文版語言吻合度、意思相似度的內容效度指數為 .992，.994，.980 及 .994，.992，.994；中英文版的內在等級相關係數為 .945，.704，.894。運用認知觀點調查法發展出的量表，可正確反應出身體活動量，並擁有文化敏感度。沒有規律運動及高中以下學歷的個案有低估中等費力活動強度的傾向。

關鍵詞：國際身體活動量表、台灣、認知觀點調查法、費力、中等費力。

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