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Psychometric Parameters of the Intrinsic Motivation Inventory Adapted to Physical Education in a Sample of Active Adults from Austria

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Abstract: Introduction. Intrinsic motivation is essential for establishing life-long positive behaviors. In Physical Education (PE), this variable may have a significant impact on students' choice of adhering to an active lifestyle both in the short and long term. Many tools have been developed for the assessment of intrinsic motivation, among which the Intrinsic Motivation Inventory (IMI) was built based on the Self-Determination Theory. The aim of this study is to examine a version of the IMI adapted to PE (IMI-PE). Methods. A total of 660 customers of a Sports Service Center responded to the IMI-PE and 39 individuals carried out a test–retest of the tool within two weeks. Results. The initial model including the original pool of items showed low indexes of goodness of fit. However, the removal of item 6, 8, 13, and 14 led to excellent parameters for the four-factor model (CFI = 0.96, and SRMR = 0.0420). Internal consistency and reliability analyses confirmed the robustness of such model. The final IMI-PE, comprising 14 items distributed into four factors, represents a robust assessment tool for the analysis of intrinsic motivation in PE.

Keywords: motivation; physical education; competence; pressure; enjoyment

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1. Introduction

The Self-Determination Theory (SDT) [1] is one of the highest recognized theories concerning human behaviors. The SDT is a complex foundation of several sub-theories that try and analyze the sources driving individuals to carry out certain actions and making specific choices in their lives [2]. One of the most known determinants of human behavior, according to SDT, is motivation [1]. This psychological factor can be divided into different types of motivation, some of them being influenced by external agents, such as peers, family, or the society, and others by more internal ones, such as one's own beliefs [3]. Although each and every type of motivation may significantly contribute (negatively or positively) to one's actions, intrinsic motivation, i.e., motivation determined by internal aspects of an individual, is considered the most effective for establishing long-lasting positive behaviors, such as an active lifestyle [3]. Intrinsic motivation can be further divided in four subdimensions, i.e., enjoyment of an activity, perceived competence in such activity, importance given to the activity, and pressure felt while carrying out the activity [4]. This variable with its subdimensions has been the center of interest of research in a variety of fields, and several instruments were built for its assessment [5–7]. A tool standing out in this sense is the Intrinsic Motivation Inventory (IMI) [8,9]. The IMI is a multidimensional questionnaire created with the aim of assessing individuals' perceived experience related to a given activity [4]. Indeed, the questionnaire was not built to analyze

a specific domain; instead, it is possible to use its items to assess intrinsic motivation in any area of study/life by simply adding area-specific information to the items themselves [4]. For instance, the item "I enjoyed this activity very much" can be modified by substituting the term "this activity" with a specific one based on which activity is being observed.

In the specific area of study of human behavior, the association and influence of different types of motivation on several aspects of lifestyle and individuals' behavioral choices, especially those affecting personal health directly, have been thoroughly studied, both in older and younger populations [10]. Among such health-related behaviors, motivation in physical activity (PA) is a well-established stream of research [11]. The impact of the motivation–PA relation has assumed high significance over the years, particularly in youth populations [12]. For instance, this variable is considered as one of the main contributors to adherence to exercising and sport performance, and as such, essential for both developing healthy and lifelong active habits and positive competition-related behaviors [13]. Research in the area of competitive sports aims at assessing the interaction of motivation with other performance-related factors such as burn-out, anxiety, or doping [14,15]. Regarding intrinsic motivation in particular, a specific IMI questionnaire was adapted for its study in competitive sports [8]. In the area of healthy PA, studies using IMI have mostly been carried out in order to understand the relation between physical, psychological, or social wellbeing and general PA in healthy and ill cohorts [16,17]. However, general PA is determined by several contributors (sports club participation, leisure-time PA, etc.), among which, physical education (PE) is the most essential due to its wide reach: in fact, mostly every individual worldwide participates in PE at some point in their life as a part of their mandatory studies [18]. Therefore, the PE setting may have a larger and stronger impact on the general population and represents a vehicle for the acquisition of long-term healthy habits [19]. As per any other activity, participation in PE may also be affected by the level of motivation individuals show towards this subject [20]. Despite the extensive background of literature focusing on motivation in PE, there exists a significant gap in the analysis of the subdimensions of intrinsic motivation in this setting. In fact, most studies carried out in PE either use general motivation assessment tools, i.e., unrelated to PE [19,21–23], or they adapt comprehensive motivation questionnaires (i.e., measuring intrinsic motivation together with the other types of motivation, without assessing its subdimensions) to the PE environment [24–26].

Considering that the study of intrinsic motivation in PE is cornerstone for understanding a person's attitude towards exercising, and, ultimately, their chances to maintain active habits during their life [27] and seen the lack of tools assessing this variable and deepening in the analysis of its subdimensions in such context, the main aim of this work is to assess the psychometric parameters of a version of the IMI in competitive sports adapted to the PE setting. We hypothesize that the structural model proposed for the original questionnaire will be properly reflected for the study of intrinsic motivation in PE.

2. Materials and Methods

2.1. Design

This study uses a quantitative, non-experimental, and observational approach, and focuses on the analysis of the psychometric parameters of the IMI [8] applied to PE.

2.2. Sample

Participants were recruited from a cohort of customers of the Sport Services at the University of Innsbruck (Austria) which offers sports activities of different kinds to youth and adults within the region of Tirol. Based on Westland [28], a minimum sample size of 88 participants is required in confirmatory factor analysis using structural equation modeling in order to obtain a large effect size (0.5) and statistical power (0.8) for questionnaires composed of four latent variables and eighteen observed variables. The sample consisted of 660 adults (401 women, 259 men; mean age = 38.80 ± 17.42) with an average height of 172.42 ± 8.85 cm and average weight of 68.17 ± 13.14 kg (BMI = 22.81 ± 3.20). A total

of 57.6% (n = 380) of the sample had completed their bachelor studies, 217 participants (32.9%) had high school diploma, and 56 participants (8.4%) successfully completed other high-school or secondary school studies.

An additional, smaller sample composed of 39 adults (average age = 21.89 ± 1.84; women = 47.4%) was then asked to fill the questionnaire twice within 15 days for the purpose of assessing its reliability [29].

All studies with observational, questionnaire-based design, conducted by the Department of the researchers of this work, received a general approval from the Ethical Committee of the researchers' institution. For the purpose of the presented study, informed consent was also gathered from participants prior to filling out the questionnaire.

2.3. Instruments

The IMI in competitive sports [8] is composed by 18 items divided into four factors as follows [4]: Interest-Enjoyment (IENJ), i.e., how interested is a person in carrying out the given activity, and how they enjoy participating in it ("*doing this activity was fun*"); Competence (COMP), i.e., whether a person feels competent and skilled at carrying out the given activity ("*I am pretty skilled at this activity*"); Effort-Importance (EIMP), i.e., how much effort has the person put into carrying out the given activity, and therefore, how important they consider it ("*it was important to me to do well at this activity*"); and Tension-Pressure (TENP), which is negatively associated with intrinsic motivation and describes whether a person feels tense or pressured at participating in the given activity ("*I felt tense while doing this activity*") [4]. The IMI has been widely used in research to assess intrinsic motivation in different scientific fields, such as the academic [30,31] or the medical [32,33]. The instrument's validity and reliability has been demonstrated in a prior study [8]. Firstly, the IMI was adapted to the PE setting (IMI-PE) in accordance with the guidelines presented in the SDT official webpage [4]: per each item, the fixed segment (for instance, "*I think I am pretty good at . . . "*; "*I felt tense while . . . "*; etc.) was maintained and completed with the behavior to be observed (for instance, "*Physical Education*"; "*doing Physical Education*"; etc.). Due to the sample being German native speakers, the questionnaire was then translated into German language by a native German specialist with fluency in the English language, and successively translated back by another native German specialist with high knowledge of the English language. The original questionnaire and its back-translations were then compared by a third specialist who holds a PhD in English language and is an expert professional translator, in order to verify their equivalence. Both English and German versions of the IMI-PE are shown in Table 1 below.

2.4. Data Analysis

The first step consisted of data descriptive analysis and quality control, which included the recodification of the negative items into positive. The questionnaire's parameters were then tested using both IBM SPSS version 26 and IBM Amos version 22 software. Internal consistency analyses were carried out by means of Cronbach's Alpha and McDonald's Omega, which were applied to each factor separately. Values of both Cronbach's Alpha and McDonald's omega above 0.70 are considered acceptable, and good if above 0.80 [34,35]. Structural validity of the model was verified by means of Confirmatory Factorial Analysis (CFA). The Maximum Likelihood estimation method was run setting standardized estimates, residual moments, and modification indices as the output for model fit evaluation [36]. Based on Fabrigar et al. [37], cut-off values for items' factor loadings were set at 0.50. As suggested by Hu and Bentler [38], the model fit was examined using a combination of the Comparative Fit Index (CFI) and the Standardized Root Mean Square Residual (SRMR), with cut-off values set at 0.95 or higher (CFI) and 0.09 or lower (SRMR). Modifications towards the improvement of the model fit were conducted according to the recommendations of Collier [39] and Fabrigar et al. [37] as follows: items with factor loading lower than 0.50, and standardized residual covariances higher than 2. Finally, reliability of the questionnaire was verified by calculating the Intraclass Correlation Coefficient (ICC)

with a two-way mixed model and absolute agreement type for the test–retest data obtained twice in an interval of 15 days. Values of the ICC between 0.5 and 0.75 indicate moderate reliability, whereas between 0.75 and 0.9 indicate good reliability [40]. Any value above 0.9 correspond to excellent reliability [40].

Table 1. English and German version of the Intrinsic Motivation Inventory in Physical Education (IMI-PE). Description of the items (factor).

English Items	German Items
1. I enjoyed the PE very much (IENJ)	1. Ich habe den Sportunterricht sehr genossen
2. I think I am pretty good at PE (COMP)	2. Ich glaube, ich war ziemlich gut im Sportunterricht
3. I put a lot of effort into PE (EIMP)	3. Ich habe eine Menge Aufwand in den Sportunterricht gesteckt
4. It was important to me to do well at PE (EIMP)	4. Es war wichtig für mich, im Sportunterricht gut abzuschneiden
5. I felt tense while doing PE (TENP) *	5. Ich fühlte mich während des Sportunterrichts angespannt *
6. I tried very hard while doing PE (EIMP)	6. Ich habe mich im Sportunterricht sehr bemüht
7. Doing PE was fun (IENJ)	7. Der Sportunterricht hat mir Spaß gemacht
8. I would describe PE as very interesting (IENJ)	8. Ich würde den Sportunterricht als sehr interessant beschreiben
9. I am satisfied with my performance in PE (COMP)	9. Ich war mit meiner Leistung im Sportunterricht zufrieden
10. I felt pressured while doing PE (TENP) *	10. Ich habe mich im Sportunterricht unter Druck gesetzt gefühlt *
11. I was anxious while doing PE (TENP) *	11. Im Sportunterricht war ich ängstlich *
12. I didn't try very hard at doing PE (EIMP) *	12. Ich habe mich im Sportunterricht nicht sehr bemüht *
13. While doing PE, I was thinking about how much I enjoyed it (IENJ)	13. Während des Sportunterrichts habe ich darüber nachgedacht wie sehr ich es genieße.
14. After doing PE for a while, I felt pretty competent (COMP)	14. Nachdem ich eine Weile den Sportunterricht besucht habe, fühlte ich mich sehr begabt
15. I was very relaxed while doing PE (TENP)	15. Im Sportunterricht war ich sehr entspannt
16. I am pretty skilled at PE (COMP)	16. Ich war ziemlich talentiert im Sportunterricht
17. PE did not hold my attention (IENJ) *	17. Der Sportunterricht hat mein Interesse überhaupt nicht geweckt *
18. I could not do PE very well (COMP) *	18. Im Sportunterricht war ich nicht sehr gut *

Note. IENJ = Interest-Enjoyment; COMP = Competence; EIMP = Effort-Importance; TENP = Tension-Pressure; * = negative items.

3. Results

The IMI-PE initially showed low score for the CFI index (χ^2 = 1164.697; df = 129; CFI = 0.899, SRMR= 0.0822). After verification of modification indices, standardized residual covariances, and factor loadings, item 14 (*After doing PE for a while, I felt pretty competent*) from COMP was removed due to a low loading score (λ = 0.49), also in comparison to the rest of the items ($\lambda \geq 0.55$). Removing item 14 determined an increase in the value of Cronbach's alpha for the factor COMP from 0.813 to 0.933. Since all the remaining items presented sufficient factor loadings, no other was removed before re-testing the model. Although the removal of item 14 improved the model (CFI = 0.947, SRMR = 0.0660), the value of CFI was still indicating an insufficient fit for the proposed structure. Following the steps highlighted, high standardized residual covariances for items 6 (*I tried very hard while doing PE*), 8 (*I would describe PE as very interesting*), and 13 (*While doing PE, I was thinking about how much I enjoyed it*) were separately removed from the model. The model fit was reassessed after each individual modification. CFA for the model after the above-mentioned procedures and the elimination of items 6, 8, 13, and 14 showed good values of the goodness of fit indexes (χ^2 = 446.672; df = 71; CFI = 0.954, and SRMR = 0.0526). The final model was composed by *Interest-Enjoyment*: three items; *Competence*: four items; *Effort-Importance*: three items; and *Tension-Pressure*: four items (Figure 1).

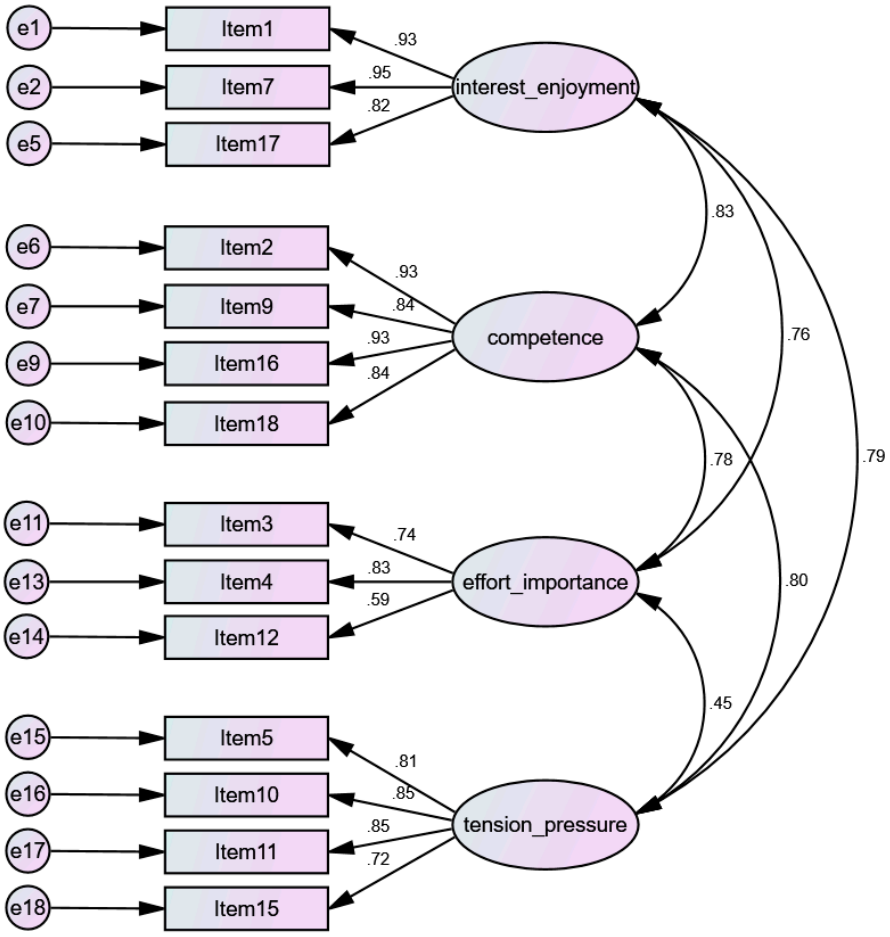

Figure 1. Final model of the Intrinsic Motivation Inventory in Physical Education.

Item loadings of the final model ranged from 0.59 to 0.95. A summary of the loadings of the final item pool is shown in Table 2 below.

Table 2. Item loadings per each factor of the final version of the Intrinsic Motivation Inventory adapted to Physical Education (cut-off value = 0.50).

Item	IENJ	COMP	EIMP	TENP
Item 1	0.93			
Item 7	0.95			
Item 17	0.82			
Item 2		0.93		
Item 9		0.84		
Item 16		0.93		
Item 18		0.84		
Item 3			0.74	
Item 4			0.83	
Item 12			0.59	
Item 5				0.81
Item 10				0.85
Item 11				0.85
Item 15				0.72

Note. IENJ = Interest-Enjoyment; COMP = Competence; EIMP = Effort-Importance; TENP = Tension-Pressure.

Cronbach's alpha and McDonald's omega scores for each of the four factors are presented in Table 3.

Table 3. Internal consistency and reliability of the Intrinsic Motivation Inventory adapted to Physical Education.

Factor	Cronbach's Alpha	McDonald's Omega	ICC
IENJ	0.925	0.926	0.869
COMP	0.933	0.936	0.825
EIMP	0.763	0.774	0.879
TENP	0.880	0.847	0.883

Note. ICC = Intraclass Correlation Coefficient; IENJ = Interest-Enjoyment; COMP = Competence; EIMP = Effort-Importance; TENP = Tension-Pressure.

All factors were significantly correlated with each other ($p < 0.001$), with correlation coefficients ranging from 0.45 to 0.83.

Finally, the ICC showed good test–retest scores for each of the four factors in the model (Table 3).

4. Discussion

The aim of this study was to test the validity and reliability of the IMI adapted to PE (IMI-PE) in a cohort of Austrian adults. The structural model was negatively affected by item 6 (*I tried very hard while doing PE*) from EIMP, items 8 (*I would describe PE as very interesting*), and 13 (*While doing PE, I was thinking about how much I enjoyed it*) from IENJ, and item 14 (*After doing PE for a while, I felt pretty competent*) from COMP.

Concerns with item 6 might be explained by reading the text of the other items from the same construct. For instance, the meaning of item 12 (*I did not try very hard while doing PE)* seems the same as that of the excluded item, and is simply presented in a negative manner. This may lead to the risk of collinearity, which is known to potentially lead to reduced significance of the outcomes of certain statistical approaches [41]. The risk in the presence of redundant items, which increase the length of a questionnaire without adding substantial information, is a well-known issue and it is commonly treated by eliminating at least one of the items showing collinearity with other questionnaire elements, especially in newly built instruments [42]. This may also be seen as a positive solution due to the fact that it reduces the overall length of an instrument; in fact, the response burden may affect participants' completion rates and the quality of the responses [43], as already shown in previous works [44,45]. In our case, it is possible that the two items above, i.e., the eliminated item 6 and item 12, were detected as too similar to justify keeping them both in the model and to actually add valuable information to the construct of EIMP. In addition to this, concerns may rise also from the nature of this item compared to item 3 (*I put a lot of effort into PE*): the latter asks participants whether they feel they inverted energy into PE, or PE led them to exertion—which reflects the nature of the construct it contributes to (EIMP, i.e., effort and importance); the former, however, refers more to "do their best", which may be interpreted not only as referred to physical effort, but also to motor skills. As some authors have pointed out, the perceived effort in doing a certain physical activity does not linearly correlate with the perceived skills/competence in said activity [46]; hence, the two concepts may be too different to be contained within the same factor.

Regarding item 14, this item seems to have been built in a different way compared to the other items in the same factor: in fact, it refers to a developmental process (becoming competent after some time participating in PE) rather than a well-structured condition (*"I think I am good at PE"*; *"I am pretty skilled at PE"*; etc.). Perhaps, the question may have been interpreted differently by the participants compared to the other items in the same factors; indeed, while one can perceive him/herself as generally competent, that does not always imply that such perceived competence has been acquired over a certain time practicing PE. Instead, it might originate from innate/genetic factors that make a person naturally skilled towards exercising (unrelated to the particular case of PE). The difference between natural and acquired characteristics has been highlighted previously,

evolving over the time with many scientific and non-scientific theories and debates [47]. Yet, these conditions are recognized as different, and, consequently, may lead to different perceptions of oneself [47]. An example in the field of exercise has been proposed by Ochmann et al. [48], who studied a sample of physically inactive, yet healthy adults. The authors split the sample into two groups based on their initial aerobic capacity (high innate aerobic capacity vs. low) and analyzed differences in resilience among them during and after a training intervention [48]. Their outcomes showed that the psychological attitude towards exercising was significantly different between the groups [48]. Alternatively, perceived competence towards PE may be the result of a person being involved also in out-of-school PA [49]. If the individuals in our study were involved in such activities at the time they were in school, these may have helped them developing a feeling of competence in the PE classes as well. Indeed, youth's perceived competence may be increased by several out-of-school strategies, including, for instance, exergames [50]. According to a study by Gao et al. [50], playing exercise-based videogames does not only increase the perception that youth have of their exercise competence, but even their actual motor skills and total PA. Combined with the popularity of videogames and constant increase in the number of gamers in recent decades [51], this may at least partially contribute to explaining the problem generated by the way our excluded item was formulated. The positive effect of out-of-school PA, sport, and physical fitness on perceived motor competence is confirmed by Duncan et al. [52], who also underline its role as a mediator between fitness levels and motor skill development. Although we do not have data on out-of-school PA in our sample, we may hypothesize that for some of the participants the increase in perceived competence over the time they had to recall for filling this questionnaire out might have been the result of being active in and out of school, hence not only during PE.

An issue that might be common to the excluded items 14 (COMP) and 8 (INEJ) may be found in other external factors influencing PE, especially in our sample, which was constituted by individuals who had already completed the early educational levels and were no longer directly involved in PE classes at the moment of the study. Hence, to respond to the IMI-PE, one may have recalled a specific period of their education (middle school, or primary school) rather than their overall PE experience throughout the different levels of education. In fact, at each educational level, students' experience in PE may be determined by factors such as the school equipment and spaces for PE [53], teachers' skills and in-class behaviors [54], or the content of the PE curriculum [55]. Each of these components may be completely different from primary education to middle and high school, as students often need to move from one school to another once they enroll in a higher level of education. Therefore, it may become easier for a respondent to recall a certain PE period (for instance, only middle school) rather than summarizing the whole experience across educational levels with such different conditions at play. Additionally, item 8 may show conceptual problems compared to the other items in the same factor (*I enjoyed the PE*, *Doing PE was very fun*, etc.). In fact, according to the Cambridge Dictionary, something can be considered as "interesting" if it keeps someone's attention due to being unusual, exciting, or because it presents many ideas; on the other hand, "fun" is associated with something giving pleasure, particularly if not at all serious [56]. Although these two concepts have been linked in research on exercise [57,58], they are not always directly correlated. Indeed, a content presented by a PE teacher may be full of ideas and requiring full attention from their students, yet not be fun [59]. Vice versa, less attention-demanding activities, such as a sport discipline, may be felt as fun by a pupil. This may lead to an essential difference between the excluded item and the nature of the factor it belongs to, which is strictly connected to the idea of fun. Finally, item 13 was also removed from the IENJ factor, and the reason for it might be found in the way the linked question is posed to the participants. Although the items in this factor, overall, ask students whether they had fun during PE, this item asks respondents if they were thinking how fun the PE was while they were actually doing it. Clearly, the two concepts (having fun and thinking about how much fun something is) are not always related, for when kids enjoy an activity, they do not tend to think about it, but

they rather just keep doing it. In fact, the development of cognitive functions, including abstract thinking, happens over the course of maturation [60], and, therefore, the type of reasoning inquired with item 13 may have not yet been developed depending on the educational level to which the questionnaire respondent refers to.

After removal of the above-mentioned items, the IMI-PE showed validity scores in line with those for the IMI in competitive sports, as presented by McAuley et al. [8]. Although the structural model analysis is not directly comparable due to differences in the statistical approach, both McAuley's model and the one in this study present adequate indexes of goodness of fit, underlining the robustness of the four-factor approach. In terms of internal consistency, McAuley et al. [8] did not present data from McDonald's omega; however, results from Cronbach's alpha are good for each of their four factors. Nonetheless, our factors showed considerably higher internal consistency compared to the IMI for competitive sports. A reason for this difference may be found in the way the instrument was modified to fit the studied situation: McAuley et al. [8] mention that their questionnaire was adapted so as to refer to a particular basketball event (match) of short duration. Considering that some of their items addressed a general condition whilst others the specific event (for instance, "*I think I am pretty good at basketball*" and "*I am satisfied with my performance in this game*", respectively; both belonging to the "Competence" factor), it is possible that this aspect determined issues in participants' interpretation of the statement and, consequently, their response. This potential threat is particularly emphasized in the "Tension-pressure" factor, for which McAuley and colleagues found a Cronbach's alpha of 0.68, which is acceptable but only indicating moderate consistency [61]. In competitive sports, there is still discrepancy among scientists about the relation between match pressure and performance, and the former may be disrupted by match conditions (type and importance of match, type of opponent, type of the event, etc.) [62]. In our case, all items referred to overall PE rather than a particular lesson, and all factors obtained very high alpha and omega scores. Perhaps, this may hint at the fact that the instrument's structure is more robust when investigating the general attitude of individuals rather than a specific response to a given situation. Although McAuley et al. [8] did not carry out reliability analyses and, consequently, we cannot compare such outcomes from the two questionnaires, our results from ICC analyses may help supporting the above statement as they show that participants' answers remain significantly consistent within a short time lapse [29].

Strengths and Limitations

A limitation of this study is the use of a sample of population that is mostly active as participants were recruited from a cohort of members of the Sport Services at the University of Innsbruck, Austria. Therefore, all individuals included in the final sample were participating in one or more sports courses offered by such Sport Services. The use of other cohorts, including sedentary individuals, might bring additional strength to the model structure. Moreover, no information was gathered regarding participants' PA levels, which could also be associated with different levels of intrinsic motivation. In future research, a deeper analysis of individuals' lifestyle may help us better understand how people's behaviors are linked to their engagement in PE. Additionally, participants were all adults who had already completed their basic education and were no longer involved in PE courses at the time of the study. Although the effect of PE is known to be significant for individuals' lifestyle during adulthood [63], their answers were based on recalling their experience from a previous period of their life. Perhaps, considering the essential role that students' attitude plays for a positive learning experience during PE [64], in the future it would be recommended to include a sample of younger participants at different educational levels, who can directly report their current experience with the PE subject. Additionally, studies contrasting IMI-PE parameters by sex and educational level may be interesting since they might lead to population-based adjustments, increasing the efficacy of the outcomes, and, therefore, they are recommended. The validation of this questionnaire

may be helpful in future research exploring the relation between active habits and PE, as well as for the study of complex structural models including the mediation effect of intrinsic motivation towards PE between teachers' skills and their students' engagement in PA. This may contribute not only to the overall scientific knowledge in the area of PE/PA pedagogy, but also to curriculum changes and adaptation in different educational systems and levels.

5. Conclusions

This work highlights that the adaptation of the IMI questionnaire to the PE environment is adequate, although it differs from the original instrument due to the removal of four items. The deleted items showed incongruences with the other items in their respective factors, both in terms of concepts discussed and terminological meaning. The changes in the structural model of IMI may be due to the nature of the PE setting compared to the original IMI questionnaire, which focused on sports and, in particular, sports events. In particular, the latter targets populations that carry out sports "by choice" (i.e., people who chose to participate in organized sports, and to compete in sports events); hence, they are more naturally inclined to exercising and more likely to be intrinsically motivated towards PA. In contrast, PE is a school subject, and as such all students, regardless of their preferences or willingness to be active, are required to participate in it. This means that not all of them are naturally driven to exercising, making the understanding of intrinsic motivation and its relation to other surrounding variables (teachers' skills, curriculum contents, class structure, etc.) even more essential in said context. The final version of the IMI-PE showed adequate parameters in terms of validity, reliability, and repeatability. The questionnaire comprises 14 items divided into the four original factors of Interest-Enjoyment, Competence, Effort-Importance, and Tension-Pressure. Given the growing need to transmit healthy active habits since early ages and the important role played by PE in this process, the assessment of intrinsic motivation in the PE classes is essential for the establishment of educational plans that allow this subject to involve and engage each and every student in an enjoyable, interesting manner. This instrument may help assessing the long-term impact of different PE experiences on exercise behaviors in adult life. Therefore, it can provide local and state administrators of the educational system and health professionals with essential information that may be used to both analyze and, if necessary, modify PE curricula, and to build tailored exercise plans based on people's previous experience with school PE.

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