

4-2022

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Recommended Citation

Shen, Bo; Lu, Xinyang; and Bo, Jin (2022) "Cross-Cultural Studies of Motivation in Physical Education: A Systematic Review," *International Journal of Physical Activity and Health*: Vol. 1: Iss. 1, Article 6.

DOI: <https://doi.org/10.18122/ijpah1.1.6.boisestate>

Available at: <https://scholarworks.boisestate.edu/ijpah/vol1/iss1/6>

Cross-Cultural Studies of Motivation in Physical Education: A Systematic Review

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Abstract

Researchers have investigated whether or not motivational constructs that originated primarily through Western beliefs could be applied or generalized to different cultural contexts. A number of theoretical frameworks have received cross-cultural attention, but findings remain inconclusive. The purpose of this study is to synthesize the characteristics of current cross-cultural studies of motivation in physical education. The initial search identified 380 articles from seven databases and 19 studies were included after removing duplication and screening against eligibility. The syntheses support the generalizability of motivational constructs but reveal that the magnitudes of motivation and the associations between motivation and educational outcomes are varied significantly across culture. Students with collectivist beliefs in Eastern countries are more likely to initiate their perceptions of autonomy support from authority figures such as parents and teachers, demonstrate a lack of internal consistency of introjected and external regulation, and differentiate effort from ability, than their Western counterparts. With globalization and increasing diversity, it is important to enhance the awareness and understanding of motivational characteristics from a social-cultural perspective. We suggest that future study consider construct equivalence of motivation and comparability of environment and context across culture to advance the quality in the field.

Key words: sociocultural factors, self-determination, value, goal orientation, interest

Introduction

Motivation is the internal process that gets students to learning behavior with energy and direction (Alexander, Schallert, & Reynolds, 2009). Although competence and prior knowledge are essential for mastering a subject, success and achievement are more likely to occur when students display high motivation during their pursuit of the subject. In physical education (PE), Researchers on motivation have generated many informative findings with a number of theoretical frameworks guiding to develop motivational constructs. Of the many motivational constructs, goal orientations, expectancy beliefs (e.g., ability self-concepts), task value, interests, and self-determination, have been identified as important motivators situated in students' learning and engagement in PE (Chen & Wang, 2017). Generally, learning is enhanced when students are task goal-oriented (Elliot, Murayama, & Pekrun, 2011); have high expectations of success and subjective task values (Wigfield, Tonks, & Klauda, 2016); perceive tasks interesting and attractive (Chen & Wang, 2017); and are provided with choice and caring (Deci & Ryan, 2000). Moreover, motivation is malleable and reflective to changes in sociocultural factors (Wang, Guo, & Degol, 2020).

With the importance of considering sociocultural contexts in motivation research, there has been growing interest in cross-cultural differences in students' motivation. Since current body of motivation literature centers on Western countries, researchers question whether or not the theories that originated mainly through Western beliefs could be applied or generalized to different cultural contexts with possible changing patterns (Roth, Kanat-Maymon, Assor, & Kaplan, 2006). For example, Markus and Kitayama (2003) have conceptualized the differences in term of "self" within individualistic versus collectivist societies. Individualistic societies encourage independence, competition, self-expression, and individual choice, while collectivist societies promote in-group conformity, dependence, and cooperation. East Europe and East Asian countries

tend to adopt more of a collectivist mindset. Students in these countries are more likely to accept value from the comments and feedback of their in-group members (Chiu & Klassen, 2010); they often conclude their own accomplishments as a joint venture among themselves and their parents, peers, and teachers. In contrast, students in the more individualistic, Western countries tend to specify their own personal improvement to build up their ability beliefs; they are more likely to view their accomplishments as purely their own (Oettingen & Zosuls, 2006). Wang et al. (2020) have suggested that the construction of motivation depend upon the values and norms reflective within a culture. The differences in cultural norms between Western and Eastern countries may affect students' development of motivation on decision-making and performance (Hagger et al., 2009).

Cross-cultural studies provide mixed findings on how different types or components of motivation predict learning outcomes and well-being. For example, Chirkov (2009) reported that regardless of differences in cultural orientations between Western countries (e.g., Belgium, Britain, Canada, the United States, etc.) and Eastern, non-Western nations (e.g., Brazil, South Korea, China, Russia, etc.), autonomy support from teachers and parents could predict autonomous motivation in students, high academic outcomes, and high self-esteem. In PE, Taylor and Lonsdale (2010) compared Britain and Hong Kong China school students on the associations of autonomy support from teachers with psychological need satisfaction and subjective vitality and effort in class. Their results revealed that though there were different in the level of motivation, autonomy supportive environment promoted positive student experiences across both samples. Similar results were also found in other motivational constructs, such as achievement goals (Xiang, Lee, & Shen, 2001) and interest-based motivation (Roure, Lentillon-Kaestner, Meard, & Pasco, 2019), suggesting cross-cultural generalizability.

Contrarily, other researchers argue that some motivational characteristics are not universal (Markus & Kitayama, 2003). Although some motivational characteristics (e.g., autonomy) are important psychologically in individualistic cultures such as the United States, it may not play as important a role in collectivistic cultures, such as Eastern Asia, where individuals are generally more interdependent (d'Ailly, 2003). Iyengar and Lepper (1999) reported that personal choice was highly motivating to Anglo American children when learning a new task, but not to Eastern Asian children who were more motivated when choices were made by their parents or close peers. Their perception of "group autonomy" seems more appropriate than personal autonomy. In PE, researchers have also found significant discrepancies in motivation across counties. For example, Lonsdale, Sabiston, Taylor, and Ntoumanis (2011) revealed that students in Eastern countries (e.g., Hong Kong, China) were more likely to internalize the regulations from authority figures than their counterparts in Western (e.g., the United Kingdom). Dai, Chen, and Liu (2019) found that the function of ability self-concepts on physical activity engagement were much stronger for Western students than Eastern students.

Therefore, although a number of motivation constructs have received cross-cultural attention, the findings regarding the role of culture plays in motivation remain inconclusive. To our knowledge, there has been no systematic review examining nationality-based cultural differences in student motivation via planned instead of post hoc comparisons in PE. Given the global prevalence of diversity and physical inactivity in children and adolescents, a systematic review of available research findings is of paramount importance. Synthesizing national and cultural differences in motivation will not only help validate the applicability and generalizability of motivation constructs across cultural contexts, but also enhance our understanding of their universality versus cultural specificity (Wang, et al., 2020).

This study is designed to synthesize the characteristics of cross-cultural studies of motivation in PE. As a systematic review of current discourse, it addresses an important issue in PE: Do student motivation and its association with education outcomes vary by cultures? By discussing the insights gained from extant literature, this study also attempts to extend our understanding of sociocultural and contextual factors related to motivation. Additionally, it concludes with the limitations of extant research and offers suggestions to advance knowledge through future study.

Method

Study Selection Criteria

We established the following criteria to select articles in review: (1) peer-reviewed, data-based research articles published in English; (2) published between 2000 and April 2021 to reflect recent development; (3) addressed cross-cultural comparison of motivation with at least two nations/cultures; (4) was relevant to K-12 physical education. In contrast, research articles related to athletics, recess, or afterschool programs were excluded to narrow down the scope of this review.

Search Strategy

We performed a keyword search in seven electronic bibliographic databases: Medline, PsycINFO, PubMed, Education Resources Information Center (ERIC), Sport Discus, Physical Education Index, and Web of Science. The search algorithms included all possible combinations of key words from the following three groups: (1) “cross-cultural,” “cultural comparison,” “intercultural,” “transcultural,” “transnational;” (2) “motivation,” “values,” “expectancy,” “attitudes,” “goal orientation,” “interest,” “self-efficacy,” “self-determination;” and (3) “physical education,” “school physical education,” “physical activity class.” We also conducted the same key word-based search in Google Scholar. Potential articles were identified via hand-searching and reviewing reference lists of relevant papers.

We screened titles and abstracts of the studies classified via the keywords search in accord to the study selection criteria. Full-text copies of potentially relevant studies were downloaded and stored in a shared Google Drive folder across the authors. Thereafter, two coauthors of this study (BS and XL) conducted formal review of all the articles independently. To keep high agreement of inclusion, we assessed the inter-rater agreement between the two coauthors using the Cohen’s kappa ($k=.87$). Any discrepancies were discussed and resolved by the consensus with a third coauthor (JB). Also, by cross-referencing the bibliographies of the selected articles, we further screened and identified additional studies with the same eligibility to ensure the completeness of our systematic review.

Data Extraction and Preparation

We created a standardized data extraction form using an Excel spreadsheet. The following methodologic and outcome variables were included: authors; publication year; study locations, study description/purpose; participants & sample size; sample characteristics (e.g., elementary, middle school, junior high, or high school students, etc.); sample setting (e.g., urban, suburban, or rural, etc.); research design (e.g., qualitative studies, cross-sectional, prospective, longitudinal quantitative studies, experimental studies, etc.); detailed measure of motivational constructs; outcome measurement (e.g., self-report questionnaire, direct measurements, etc.); statistical model; and key findings.

Data synthesis

Due to the evident discrepancy between studies in research design, study sample, motivational constructs and measurements, it was almost impossible to pool data together for a meaningful meta-analysis. As such, we synthesized the data in a narrative way. Specifically,

descriptive information, common theme and findings of the included studies were calculated and summarized. The two coauthors (BS and LX) conducted the data extraction, theme identification, and narrative summarization independently. Their differences were resolved by involving a third coauthor (JB).

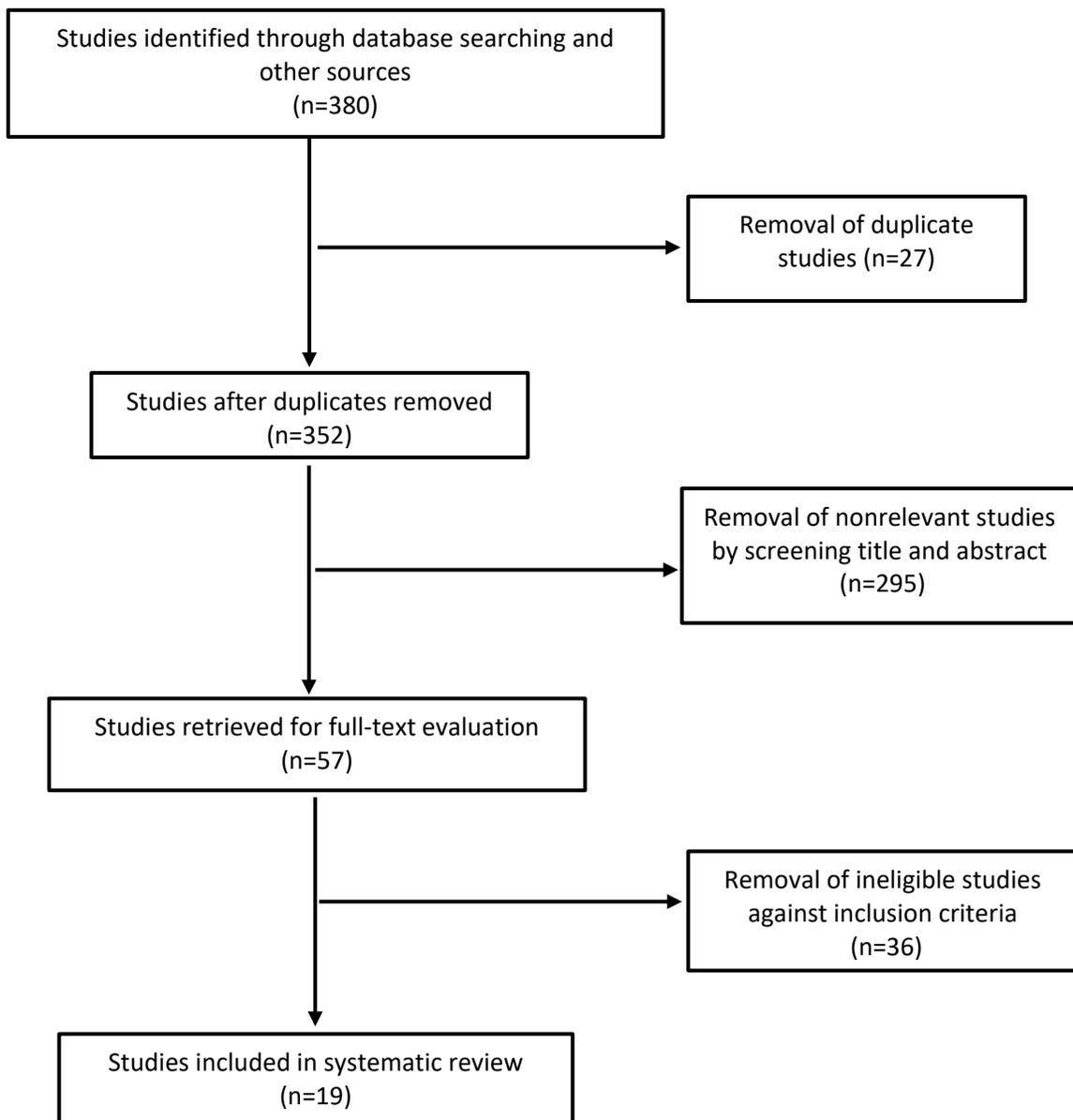
Results

Study selection

The study selection flow chart was shown in Figure 1. There were 380 potentially relevant articles identified. After the removal of all duplicates, we screened the titles and abstracts of the remaining articles against the study selection criteria. With thoroughly reviewing the remaining articles, we concluded a total of 19 studies in our systematic review. The inter-rater agreement was 97.5% among the coauthors for the included articles.

Figure 1

Flow diagram of studies through the review process.



Basic characteristics of the included studies

The characteristics of all included studies are shown in Table 1. Majority of the studies (17 out of 19) involved European countries in which the motivation characters were compared cross-culturally. Within those, six studies were conducted within European countries (e.g., Eastern vs Western Europe) and the other 11 studies reported the comparison between European and Eastern Asian countries. The last two studies included the comparison between American and Asian countries. Particularly, the United Kingdom was the primary venue (n=9) in the comparison. Of the 19 studies included in our systematic review, all were targeting older children and adolescents (10-18 years) using non-experimental quantitative design: five were prospective studies with two or three data collection points while the remaining 14 studies all adopted a cross-sectional study design.

The sample size was generally large but varied significantly across studies, ranging from 551 to 4923. All included studies recruited both female and male students with the percentage of females ranging from 41% to 71%. The majority of studies took some socio-demographics into consideration and most of them were conducted in public schools in urban setting. A variety of statistical models were applied across studies, including structural equation modeling (i.e., confirmative factor analysis, path analysis, and multilevel path modeling), multivariate analysis of variance, multiple regression, etc.

Data synthesis

Most articles (n=16) examined motivational constructs in the context of countries with assumed different cultures (i.e., individualist vs collectivist) while only 3 was conducted under similar cultures. Also, the majority of studies focused on cross-cultural validation of motivation instruments and invariance of motivational models, with constructs from Self-Determination Theory (e.g., perceived autonomy, autonomy support, self-determined motivation) being the most applied theoretical framework. Moreover, many studies further compared the differences in motivation magnitudes and their association with educational outcomes between the countries.

In general, empirical studies across Western and Eastern countries follow a similar pattern: motivation constructs are valid and predictive of educational outcomes. For example, Hagger and his colleagues (2005; 2009) examined the replicability and invariance of proposed relationships of a trans-contextual model of motivation among multiple countries (e.g., the UK, Greek, Polish, Singapore, Estonia, Finland, & Hungarian). Authors found that there was an overall congruence across cultures. Autonomous motives in a PE context had significant total effects on autonomous motives in a leisure time context via the mediation of theory of planned behavior constructs. Other scholars (Wang, Hagger, & Liu, 2009; Lonsdale et al., 2011; Yang et al., 2019) investigated the validity of the factor structure and invariance of the Perceived Locus of Causality (PLOC) instrument in different population (e.g., Singapore, UK, Hong Kong, China, Spain). They revealed that there was an overall cross-cultural validity for the scores of the PLOC with the invariance of the factor structure across samples. Similarly, instant enjoyment and exploration intention in class showed a strong cross-cultural impact on the construction of situational interest (Roure, Lentillon-Kaestner, Méard, & Pasco, 2019). Ability self-concept predicted students' moderate-to-vigorous physical activity (MVPA) in leisure time across the USA and China (Dai et al., 2019). Detailed measurements and key findings in the review are shown in Table 1.

While a number of researchers have found support for the applicability of motivational constructs/models in PE, the variations in motivation magnitudes and the strengths of association between motivation and educational outcomes (e.g., class engagement, effort, subjective vitality, MVPA) suggest a function of cultural differences, especially between Eastern and Western nations.

Lonsdale et al. (2011) found that compared to counterparts in the UK, students in Hong Kong, China were more likely to demonstrate a lack of internal consistency of introjected and external regulation scores of the PLOC in PE. Hagger and colleagues (2003; 2005; 2009) reported that students under Western cultural norms (e.g., the UK, Finland) were more likely to endorse self-determined form of regulation in PE than their counterparts in Eastern collectivist countries (e.g., Hungary, Singapore, Hong Kong, China). Nevertheless, students with collectivist beliefs were more likely to initiate their perceptions of autonomy support from authority figures such as parents and teachers (Wang et al., 2009; Soos, et al., 2019). Likewise, although ability self-concept and enjoyment were significantly related to MVPA, the strengths of the association were much stronger in the US sample than the Chinese sample (Dai et al., 2019). Also, Chinese students were more likely to differentiate effort from ability in PE than American students whereas American students were more likely to be task-oriented (Xiang, Lee, & Shen, 2001). Detailed information is displayed in Table 2.

Identified limitations

As shown in Table 3, most studies identified research limitations and provided suggestions for future study. We concluded with the limitations of extant literature. The most popular comments being addressed were examination of invariance/replication of motivational models in broader cultural contexts and consideration of studies with experimental/longitudinal design. Also, researchers emphasized on paying attention to comparable and representative sampling between nations and applying more objective measures of motivation and educational outcomes. Additionally, some researchers suggested to consider the possibility of heterogeneity even within the same culture and classify cultures based on actual assessment instead of nationality or ethnicity.

Discussion

This study was designed to synthesize the characteristics of cross-cultural research on motivation in physical education. A total of 19 studies, including 14 cross-sectional and 5 prospective ones, met the selection criteria and were included in this review. Consistent with findings in education and well-being (Chirkov, 2009), motivation is associated with learning and achievement in PE regardless of the culture and country in which a student resides. Higher motivation is related to higher achievement and engagement (Chen & Wang, 2017). Specifically, research indicates that in both Western and Eastern countries, self-determined and task goal-oriented motivation can demonstrate positive relationships with adaptive outcomes. Both ability self-concepts and task values are strong predictors of learning and future PA intentions. This evidence converges to suggest that motivation is a key ingredient to be success in PE, supporting the generalizability of current motivation constructs.

However, not all aspects of motivation's role in learning and achievement in PE are universal. Rather, there are significant variances across countries in the interpretations and the purpose of motivation. To some extent, the conditions under which students become motivated are culturally dependent with specific characteristics. As shown in the systematic review, cultural differences in motivation are not only reported in the magnitudes, but also the strengths of correlations within specific motivation constructs (e.g., the PLOC; situational interest) and between the constructs and educational outcomes (e.g., PA involvement, effort). For example, students in East Asia were more likely to value opinions delivered by authority figures and internalize these externally imposed motives in PE (e.g., "because I will get into trouble if I don't), whereas Western students were more individualistic and autonomous (Lonsdale et al., 2011). Interestingly, despite similar MVPA after school, East Asian students had lower ability self-

Table 1*Basic characteristics of the articles included in the review (n=19)*

ID	First author (year)	Study description	Countries included	Study design	Sample size	Age (year)	Female (%)	Sample characters	School Setting
1	Xiang, et al., (2001)	Age-related changes in conceptions of ability and achievement goals, and the relationship between them	US & China	Cross-sectional	US=308 CH=371	10-18	US 51% CH 52%	Elementary, middle and high school	US: urban private, high SES China: urban, public middle SEC
2	Hagger et al. (2003)	The hierarchical multidimensional model of physical self-perceptions	UK, Hong Kong, Russia	Cross-sectional	UK=294 9 HK=172 2 RU=252	12-17	UK 52% HK 47% RU 53%	High School	Public, urban, middle SES
3	Hagger et al. (2005)	The replicability and invariance of proposed relationships of a trans-contextual model of motivation	UK, Greek, Polish, Singapore	Prospective	UK=222 GR=93 PO=103 SI=133	13-17	UK 46% GR 61% PO 54% SI 50%	High school	UK: Urban Middle GR: Suburb Middle PO: suburb low SI: urban middle
4	Nishida et al. (2007)	Learning motivation, supporting factors, and preference in learning.	Japan & Swedish	Cross-sectional	JA=156 2 SW=573	10-13	JA 50% SW 46%	Elementary school	JA: Urban SW: Urban
5	Hagger et al. (2007)	The cross-cultural generalizability of the theory of planned behavior	UK, Estonia, Greek, Hungary, Singapore	Prospective	UK=432 ES=268 GR=150 HU=235 SI=133	12-16	UK 54% ES 56% HU 51% SI 50%	High School	Urban & Suburbs Low to middle SES

6	Hagger et al. (2007)	A measure of perceived autonomy support and its replicability.	UK; Estonian; Hungarian	Cross-sectional	UK=210 ES=268 HU=235	12-16	UK 55% ES 56% HU 51%	High School	All public schools
7	Hagger et al. (2009)	An extended trans-contextual model from PE to leisure-time PA	UK, Estonian, Finnish, Hungarian	Prospective	UK=404 ES=61 FI=158 HU=286	12-17	UK 55% ES=56% FI=56% HU=51%	High School	All public with average SES
8	Ries et al. (2009)	A model of the Theory of Planned Behavior	Spain & Luxembourgish	Prospective	SP=613 LU=752	14-17	SP 49% LU 54%	High School	Public and private school. Middle SES
9	Wang et al. (2009)	The validity of the factor structure and invariance of the PLOC instrument.	Singapore & UK	Cross-sectional	SI=1449 UK 1463	11-17	UK 52% SI 50.7%	High school	SI: Random sample in country UK: public
10	Taylor et al. (2010)	The influence of perceived teacher autonomy support on subjective vitality and effort	Hong Kong & UK	Cross-sectional	HK=395 UK=320	13-15	59%	High School	Both urban
11	Lonsdale et al. (2011)	The psychometric properties of scores derived from two instruments, the PLOC Questionnaire and the Situational Motivation Scale.	UK & Hong Kong	Cross-sectional	UK=300 HK=342	UK 13-15; HK 11-16	UK 44% HK 41%	Secondary school	UK: urban HK: urban
12	Extremera et al. (2016)	How social goals, perceived locus of causality and causal attribution can predict goal orientations.	Costa Rica; Mexico, Spain	Cross-sectional	CR=423 ME=408 SP=133 7	11-16	49.6%	High school	Both public and private schools

13	Cid et ail. (2016)	The Basic Psychological Needs Questionnaire	Portugal & Brazilian	Cross-sectional	PO=616 BR=450	P 9-18 B14-18	PO 47% BR 49%	Middle & High school	PO: Public BR; Public & Private school
14	Dai et al. (2018)	The invariances of scales measuring self-efficacy and enjoyment.	China & USA	Cross-sectional	CH=357 USA=506	11-17	CH49.9% US55.5%	Elementary, middle, & high schools	CH: urban US: urban
15	Hein et al. (2018)	The factor structure and invariance of the Controlling Teacher Behaviors Scale	Estonia & Lithuania	Cross-sectional	ES=453 LI=432	13-15	51%	High school	Urban
16	Soos, et al., (2019)	The relationship between autonomy motivation and support perceived from school, friends and family	UK; Hungary; Romania; & Slovakia	Prospective	UK=155 HU=389 RO=183 SL=247	11-18	UK 44% HU 71% RO 46% SL 55%	Middle and high school students	NA
17	Roure et al. (2019)	The universality and uniqueness of students' situational interest	Belgium, France, Switzerland	Cross-sectional	BE=735 FR=601 SW=476	11-18	BE50.8% FR48.6% SW45.8%	Secondary schools	French speaking areas across countries
18	Yang et al, (2019)	The psychometric properties of PLOC.	China & Spain	Cross-sectional	CH=128 SP=1006	11-16	Ch 52.5% SP 50.1%	Secondary school	CH: Urban S: Urban
19	Hutmacher et al. (2021)	The psychometric properties and measurement invariance of motivational regulation scales	French & German	Cross-sectional	GE=117 FR=630	10-23	49.2%	Elementary & secondary schools	Urban

Note. PLOC= Perceived Locus of Causality

Table 2
Measures of motivation and outcomes, and key findings in the review ($n=19$)

ID	First author (year)	Type of motivation measure	Detailed motivation measure	Type of outcome measure	outcome measure	Statistical model	Key findings
1	Xiang, et al., (2001)	Self-report	Conceptions of ability, goal orientation	NA	NA	Chi-Square & MANOVA	<ol style="list-style-type: none"> 1. Conceptions of ability and achievement goals were significantly associated. 2. Chinese students were more likely to differentiate effort from ability than American students. However, American students, were more likely to be task-oriented than Chinese students.
2	Hagger et al. (2003)	Self-report	Perceived competence, body attractiveness, self esteem	NA	NA	CFAs	<ol style="list-style-type: none"> 1. The appropriateness of hierarchical multidimensional model of physical self-perceptions was confirmed. 2. The mean scores for the physical self-worth factor were significantly higher in the British and Russian samples compared to the Hong Kong sample.
3	Hagger et al. (2005)	Self-report	Perceived autonomy support, SDT regulations, & TPB variables	Self-report	PA behavior, & intention	Path Analyses	<ol style="list-style-type: none"> 1. The effect of autonomous motives in leisure time on physical activity intentions and behavior was mediated by TPB constructs in all samples. 2. Autonomous motives in a PE context had significant total effects on autonomous motives in a leisure time context except in the Polish sample.
4	Nishida et al. (2007)	Self-report	Learning motivation & supporting factors	Self-report	Preference in learning behavior	CFAs & MANOVA	<ol style="list-style-type: none"> 1. the Swedish children had significantly higher mean scores than the Japanese children in Learning motivation, supporting factors, and preferences in learning behavior.

5	Hagger et al. (2007)	Self-report	TPB variables	Self-report	PA behavior, & intention	CFAs	<ol style="list-style-type: none"> 1. The TPB constructs were consistent across cultural groups. 2. The attitude constructs tended to be stronger in the British and Estonian samples whereas the subjective norm constructs had a greater contribution in the Hungarian sample.
6	Hagger et al. (2007)	Self-report	Perceived autonomy support from PE teachers, peer, & parents	Self-report	SDT regulations	CFAs	<ol style="list-style-type: none"> 1. The proposed model was supported across nations. 2. Estonian participants reported the highest levels of perceived autonomy support from the parent and peer sources relative to British and Hungarian participants.
7	Hagger et al. (2009)	Self-Report	Perceived autonomy support & autonomous motivation	Self-report	PA behavior, & intention	CFAs & Path Analyses	<ol style="list-style-type: none"> 1. The motivational sequence were consistent across nations. 2. Perceived autonomy support from parents influenced autonomous motivation in the British and Hungarian samples. 3. Subjective norms were not related to intentions in the Estonian and Finnish samples.
8	Ries et al. (2009)	Self-report	Attitude, perceived parental socialization and resources support	NA	NA	Correlation & CFAs	<ol style="list-style-type: none"> 1. The TPB structures were supported.
9	Wang et al. (2009)	Self-report	SDT regulations	NA	NA	CFAs	<ol style="list-style-type: none"> 1. The invariances of the factor structure across samples with two different cultural orientations were supported. 2. British participants tended to rate less self-determined forms of motivation lower and more self-determined forms of motivation higher than Singaporean participants.

10	Taylor et al. (2010)	Self-report	Autonomy support, psychological need satisfaction	Self-report	Subjective vitality & effort	Multilevel SEM	<p>1. The relationships among autonomy support, subjective vitality and effort were mediated by students' perceptions of psychological need satisfaction.</p> <p>2. The relationship between perceptions of relatedness and effort was nonsignificant in the Chinese student sample, but significant in the U.K. sample.</p>
11	Lonsdale et al. (2011)	Self-report	Contextual & situational motivation	NA	NA	CFAs	<p>1. There was an overall cross-cultural validity for scales.</p> <p>2. There was a lack of internal consistency of introjected and external regulation scores in the HK Chinese sample.</p> <p>3. The correlation between external regulation and intrinsic motivation in the sample HK was positively correlated while the correlation in UK was negatively correlated.</p>
12	Extremera et al. (2016)	Self-Report	SDT regulations, causal attributions	Self-report	Goal orientation & social goals	CFA, MANOVA	<p>1. Internal/external causal attribution and SDT regulation predicted achievement goals across cultures.</p> <p>2. The highest values in mastery-approach and social goals were obtained by Mexican students, while Spanish students scored the lowest in performance-approach goals.</p>
13	Cid et al. (2016)	Self-report	psychological need satisfaction	NA	NA	CFAs	<p>1. The scale was applicable in evaluating the satisfaction of basic psychological needs in PE context in Brazil and Portugal.</p>
14	Dai et al. (2018)	Self-report	Self-efficacy & enjoyment	Self-report	Leisure time PA	CFAs	<p>1. The invariances of scale psychometrics were demonstrated.</p> <p>2. The functions of self-efficacy were stronger in relation to PA in the U.S samples than the Chinese samples.</p>

15	Hein et al. (2018)	Self-report	Controlling teacher behaviors	NA	NA	CFAs	<ol style="list-style-type: none"> 1. The invariance of the factor structure was supported. 2. Estonian students perceived their teachers' behavior to be more controlling than Lithuanian students.
16	Soos, et al., (2019)	Self-report	TPB; autonomy motivation; perceived autonomy support	Self-report Q	Leisure time PA & intention	Path Analyses	<ol style="list-style-type: none"> 1. Students' perceived autonomy support were related to their PA intention and behavior in leisure time. 2. Students in collectivist countries perceived higher autonomy support from family than students in individualistic countries.
17	Roure et al. (2019)	Self-report	Situational interest	Self-report	Total interest	CFA & MANOVA	<ol style="list-style-type: none"> 1. Instant enjoyment and exploration intention had a strong impact on students' total interest. 2. The students in Switzerland reported the highest score for novelty, challenge & exploration intention.
18	Yang et al, (2019)	Self-report	SDT regulations	Self-report	Subjective vitality	CFA	<ol style="list-style-type: none"> 1. The reliability and the validity of PLOC were supported. 2. The Chinese sample demonstrated higher scores in intrinsic motivation than the Spanish sample.
19	Hutmacher et al. (2021)	Self-report	PLOC in PE & Behavioral regulation in exercise	Self-report	Leisure time PA	CFA	<ol style="list-style-type: none"> 1. The scales demonstrated psychometric invariance in both French and German

Note. SDT=Self-determination theory; TPB=Theory of Planned Behavior; CFAs=Confirmatory Factor Analyses; SEM=Structural Equation Modelin

Table 3*Future research directions identified by cross-cultural studies (n=19)*

Future research directions	No. of studies	References: authors (year of publication)
1) Experimental and longitudinal study	9	Hutmacher et al. (2021); Soos (2019); Xiang (2001); Roure (2019); Hagger (2007); Hagger (2009); Hagger (2007-2); Ries (2009); Taylor (2010)
2) Extending invariance/replication studies across more cultures	9	Hutmacher et al. (2021); Soos (2019); Wang (2009); Extremera (2016); Baños (2018); Yang (2019); Cid (2016); Ries (2009); Hein (2018); Xiang (2001)
3) Comparable and representative of sampling	8	Cid (2016); Rource (2019); Dai (2018); Hagger (2007-2); Ries (2009); Hein (2018), Xiang (2001); Hagger (2005)
4) Adopting objective measures of behaviors	6	Hagger (2005); Yang (2019); Dai (2018); Hagger (2009); Hagger (2007-2); Ries (2009)
5) Construct equivalence in the measurement of motivation cross cultures	6	Wang (2009); Lonsdale (2011); Yang (2019); Hagger (2009); Hagger (2003); Hein (2018)
6) Including additional motivation sources.	6	Nishida (2007); Hagger (2005); Xiang (2005); Hagger (2007); Taylor (2010); Weinberg (2000)
7) Consideration of heterogeneity within the same culture.	2	Lonsdale (2011); Taylor (2010)
8) Classifying cultures based on actual assessment	1	Dai (2018)

concepts and displayed much weaker relationships between the self-concepts and MVPA than their Western counterparts (Dai et al., 2019). These results support that cultural context plays a role in shaping student motivation in PE, indicating there is a complex and dynamic web of interrelationships between cultural context and motivation.

These motivation fluctuations may attribute to the significant differences in norms, expectation, attitudes, and other contextual factors across cultures. Chiu and Kassen (2010) have suggested that students' ability self-concepts in academics are not only associated with self-belief based on social comparison, but also with the extent of attention to in-group expectations. Western students like to perceive themselves using downward comparisons (e.g., in the context of poorer performing students) while East Asian students tend to judge their ability with upward comparisons (e.g., in the context of higher performing students). According to the findings in the systematic review, it seems reasonable to assume that cultural norm in the construction of ability self-concepts in PE is different between Western and Eastern countries. As a result of the

difference, Western students are more likely to report higher ability self-concepts in PE than Eastern students.

The development of motivation may depend upon the cultural values. Students in Western countries are encouraged to be independent and self-expressive while Eastern students are valued in terms of in-group conformity and inter-dependence (Oettingen & Zosuls, 2006). It is possible that the specific value characteristics in different culture lead to the motivation variations in PE. Consequently, Western students tend to focus more on their own and self-reliance to construct motivation and endorse more self-determined form of regulation in PE. Eastern students, on the other hand, are inclined to derive more value from the feedback of their in-group members, such as parents and teachers, and internalize these external regulations in motivation.

There is a likelihood that different structure of school curriculum, instruction, and expectations across countries impact students' motivation. Salili, Chiu, and Hong (2001) have suggested that Western nations tend to have schools that are designed around personal mastery and competency; while schools in Eastern nations like to structure tasks with group-based effort and performance. With the differences in terms of teachers' value orientation and instruction styles in PE across cultures (Zhu & Chen, 2018), we would like to speculate that specific physical education context in different countries may play as a primary medium in transmitting and cultivating cultural values and orientations to their students.

Based on the systematic review, we attempt to identify the gaps and provided recommendations for future research. First, researchers have relied on Western-based measures to assess motivation but paid little attention to the cultural validity and construct equivalence of these instruments. Simply translating questionnaires developed in North America and transporting them to other cultures might be problematic. In PE, Lonsdale et al. (2011) questioned the construct equivalence of autonomy using an identical scale across cultures, as perceptions of autonomy might vary by cultural expectations. It is suggested to create self-determination measures from within cultures rather than merely transporting measures between cultures. Using item-response theory (Ellis & Kimmel, 1992) to identify unique cultural response patterns may overcome some of the problems related to cross-cultural psychological measurement and strengthen the validity in PE.

Second, while sample sizes were general large in cross-cultural studies in PE, very few of them were able to gather nationally representative samples and took comparability between the samples into consideration. Xiang et al.'s study (2001) reported inconsistent and noncomparable social economic status between American and Chinese samples and suspected that the inconsistency might have impacted the cultural variations in conceptions of ability and achievement goals. Hagger et al. (2005) noticed age difference in their across-cultural samples that might have affected the results reflecting cultural variations, suggesting more research to determine if these country differences represent consistent patterns of variations. Meanwhile, other researchers (e.g., Roure et al. 2019; Hagger et al., 2007; Hein, Emeljanovas, & Mieziene, 2018) cautioned readers regarding the generalization of the results due to no random sampling procedures applied, which might lead to overrepresentation. Given the complexity and broad variation even within a culture, stratified and random sampling procedures is recommended.

Third, among the articles inclusive, most were designed cross-sectionally. Even a few with a prospective design, the data as a whole were cross-sectional in nature. Such research design has imposed limitation on inferences of causality. Also, although it is clear that objective measures are more accurate and reliable to reflect behavior and engagement than self-report (Thomas, Nelson, & Silverman, 2015), no study has applied objective measures to evaluate motivation and

educational outcomes (e.g., MVAP, vitality, and effort). Given the fact that quality of measures is essential for research, applying experimental design and integrating objective measures is important to better understand the nature of motivation and how motivation changes over time across culture.

Fourth, very often, cross-cultural studies in PE used national affiliation as cultural samples but their analyses were dependent upon aggregation of individual-level data. It was often assumed that if a culture has certain values, individuals within the culture will share those values. However, with the existing and increasing cultural diversity of many nations, this assumption might be unsatisfactory. Instead of polarization, there are intracultural continuities in the structure of values within the culture (King, et al., 2018). As such, individual-level analyses of cross-cultural data may yield results different from culture-level analyses. It is important to categorize cultural-related information based on actual assessment of participants' perception and behavior in PE.

A final gap to the literature is the neglect of conducting cross-cultural work in under-representative societies with significant sociocultural characteristics, such as Latin America, Africa, Arab, and others. Developing invariance/replication studies of motivation constructs across much broader cultures with diverse populations may help us better understand why differences or similarities in PE between countries occur.

Conclusion

With globalization and increasing diversity across the world, there is growing cultural heterogeneity both of nations and of smaller social systems within them. It is important to document contrasts between different cultures and examine the ways in which individuals and groups from different cultures relate to one another. This systematic review confirmed generalizability of motivational constructs but revealed that cultural values could moderate motivation and influence learning behaviors in PE. To further enhance our awareness and understanding of motivational characteristics from a social-cultural perspective, we suggest that construct equivalence of motivation and comparability of environment and context across culture must be taken into consideration. Articles written in other languages and unpublished studies/dissertations should be included as well. Also, using random stratified sampling and objective assessment of cultural values may promote the quality of cross-cultural studies in the field. In addition to establishing universal patterns across countries, it may be more practical to consider how to adapt or tune in a theory or framework to fit a specific culture (King, McInerney, & Pitliya, 2018).

Greater knowledge of motivational characteristics in different cultures will shed light on the development of motivation constructs within physical education domain. It is important for physical educators to “apply an appropriate merger of a universally relevant, generalizable concepts of motivation with culturally and ecologically specific applications, strategies, and implications.” (Wang et al., 2020, p447) Needless to say, identifying unique challenges and strengths across specific cultures can help us design culturally enriched motivational strategies to nurture and maintain students' learning and physical activity in PE to achieve long-term health benefits.

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