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Global Self-Worth among Adolescents: The Role of Basic Psychological Need Satisfaction in Physical Education

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ABSTRACT

Global self-worth is important for healthy development and learning, and is therefore highlighted as a major aim in the Norwegian physical education (PE) curriculum. Based on prior research this study aimed to assess potential differences in global self-worth and contextual basic need satisfaction among 2854 adolescents (47.5% boys, 52.5% girls, ages 13 and 16) participating in different movement contexts, and to determine whether basic need satisfaction in PE relates to global self-worth. Structural equation modeling analyses indicate that basic need satisfaction in PE relates significantly to global self-worth. However, adolescents who do not participate in movement contexts outside school report significantly lower basic need satisfaction in PE compared to their sports-active peers, and could possibly therefore experience reduced global self-worth development through PE. Findings support research showing that sports active youth reap most of the benefits of PE, and thus, that PE violates the principles of equal education.



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Self-esteem; adolescent; basic psychological needs; PE; movement contexts; organized sport; self-organized movement activity; equal education

Global self-worth has been outlined as the awareness of good possessed by the self and refers to the overall appraisal of one's worth or value as a person (Harter, 2006, 2012). Research on peoples sense of personal worth often employs terms like "self-esteem" (Harter, 2012; Marsh, Xu, & Martin, 2012), "self-worth" (Harter, 2006, 2012), and "self-concept" (Marsh et al., 2012) interchangeably, and researchers have linked positive global self-worth to various positive life outcomes. More specifically, the research literature has identified global self-worth as a significant predictor of positive adjustment to life demands (Fox, 2000), absence of antisocial behavior (Donnellan, Trzesniewski, Robins, Moffitt, & Caspi, 2005; Trzesniewski et al., 2006), social support (Marshall, Parker, Ciarrochi, & Heaven, 2013), and persistence in the face of failure (Baumeister, Campbell, Krueger, & Vohs, 2003). In addition, as one of the most frequently cited and studied indicators of mental health during adolescence (Tolman, Impett, Tracy, & Michael, 2006; Trzesniewski, Donnellan, & Robins, 2003), global self-worth has also been associated with happiness (Bum & Jeon, 2016), and has been identified as inversely related to depressive symptoms (Bos, Huijding, Muris, Vogel, & Biesheuvel, 2010; Bum & Jeon, 2016; Sowislo & Orth, 2013; Steiger, Allemand, Robins, & Fend, 2014), reduced physical health (Orth, Robins, & Widaman, 2012; Stinson et al., 2008), eating pathology (Bos et al., 2010), and risk of suicide (Sharaf, Thompson, & Walsh, 2009; Singh & Pathak, 2017).

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Global self-worth develops in the interactive relationships between the adolescent and the multitude of contexts this adolescent is involved in in his or her everyday life (Lerner, Lewin-Bizan, & Warren, 2011). In particular, participation in contexts involving bodily expression and interaction, such as sports and physical education (PE), have been identified as significantly related to positive global self-worth (Haugen, Säfvenbom, & Ommundsen, 2011; Slutzky & Simpkins, 2009; Taliaferro, Rienzo, Miller, Pigg, & Dodd, 2010), and the Norwegian PE curriculum identifies enhanced global self-worth as a major objective specific to PE (Utdanningsdirektoratet, 2015). However, researchers emphasize that a positive association between PE-participation and global self-worth should not be taken for granted (Agans, Säfvenbom, Davis, Bowers, & Lerner, 2013; Breslin, Murphy, McKee, Delaney, & Dempster, 2012; Faulkner & Tamminen, 2016) and research by Garn, McCaughtry, Martin, Shen, and Fahlman (2012) has identified students' experience of global self-worth as related to basic psychological need satisfaction in the context of PE. This paper aims therefore to add to the research by Garn et al. (2012) by determining the unique relation between basic psychological need satisfaction in PE and adolescents' experience of global self-worth, when controlling for basic need satisfaction in leisure-time movement contexts.

Basic Psychological Need Satisfaction in Movement Contexts

Basic needs theory (BNT) proposes the existence of three basic psychological needs for autonomy, competence, and relatedness (Ryan & Deci, 2017). The three basic needs refer to an individual's need to self-organize experience and behavior corresponding with an integrated sense of self (need for autonomy; Deci & Ryan, 2000), the need to feel effective and experience mastery when interacting with the environment (need for competence; Deci & Ryan, 2000; White, 1959) and the need to feel connected to others (need for relatedness; Deci & Ryan, 2000). These needs represent universal nutrients for psychological growth and wellbeing (Ryan & Deci, 2017), of which global self-worth has been considered a corner stone (Fox, 1997, 2000; Harter, Fischer, Harter, & Serwator, 1999). From the perspective of BNT (Ryan & Deci, 2017), the need to experience autonomy, competence, and relatedness is considered important independent of demographics and contexts. However, different contexts, such as organized sports, self-organized movement activity, and PE, have distinctive characteristics and may therefore serve different peoples' basic need satisfaction and global self-worth differently.

Organized youth sports in Norway are voluntary leisure-time activities governed by regulations developed by the Norwegian Olympic Committee and Confederation of Sport (NIF). Approximately 70–80% of all Norwegians are members of a sport club during their childhood, yet participation has a tendency to decrease with age (Støckel, Strandbu, Solenes, Jørgensen, & Fransson, 2010). Participation in organized sports contexts has been linked to positive mental health outcomes in adolescence (Swann et al., 2018; Vella, Cliff, Magee, & Okely, 2015), and the NIF Sport Policy Document (2015-2019; NIF, 2015) emphasizes the role of organized sports in the promotion of young peoples' mental health. As such, global self-worth development should result from organized sports participation, and previous research suggests that this may be achieved by focusing on participants' basic need satisfaction when participating in organized sports (Amorose, Anderson-Butcher, & Cooper, 2009; Coatsworth & Conroy, 2009). However, the organized sport context is influenced by different discourses (Solenes, 2010) and organized youth sport is argued to be dominated by the Olympic aims (Säfvenbom, Geldhof, & Haugen, 2014). As a consequence, NIF and organized youth sport has been criticized as somewhat elitist at the expense of a "sport for all" perspective (Säfvenbom et al., 2014).

Compared to organized sports, self-organized movement activities are not formally regulated and allow adolescents to initiate (and maintain) participation on their own terms. Self-organized activities are increasingly popular among young people, and include activities such as fitness training, climbing, dance, skateboarding, and other types of lifestyle sports (Støckel et al., 2010). According to prior research on self-organized movement activities and lifestyle sports in

particular (Gilchrist & Wheaton, 2017; Säfvenbom, Wheaton, & Agans, 2018), involvement in such activities may affect basic psychological need satisfaction and thus global self-worth positively. However, to the best of our knowledge this relationship has not yet explicitly been subject to scientific research.

In contrast to organized sports and self-organized movement activity, PE is a mandatory school subject that includes all children and adolescents on a weekly basis across thirteen years of education. The subject is regulated by the Norwegian Education Act (Opplæringslova, 1998) and practiced according to the Norwegian PE curriculum (Utdanningsdirektoratet, 2015), which highlights global self-worth as a desired outcome of PE participation (Utdanningsdirektoratet, 2015). As a mandatory subject, PE presents a unique opportunity – and obligation – to promote basic psychological need satisfaction and global self-worth among all adolescents.

Research Question

The distinctive characteristics of PE, organized sports, and self-organized movement activity mentioned above suggest that these contexts may support adolescents' basic need satisfaction differently. Experiences of basic need satisfaction in these movement contexts may not only vary in strength and relate differently to global self-worth; they may also interrelate. This means that the relationship between basic need satisfaction in PE and global self-worth may be confounded by basic need satisfaction in other movement contexts (Säfvenbom, Haugen, & Bulie, 2015). Thus, despite prior research claiming evidence for a relationship between basic psychological need satisfaction in PE and global self-worth (e.g., Garn et al., 2012), it remains uncertain whether there is a unique relationship between basic psychological need satisfaction in PE and adolescents' experience of global self-worth.

Consequently, the aim of this study is two-fold. Firstly, this study will assess potential differences in global self-worth and contextual basic need satisfaction among adolescents who participate in different movement contexts. Secondly, this study aims to determine whether there is a relationship between basic psychological need satisfaction in PE and adolescents' experience of global self-worth, when controlling for basic need satisfaction in organized sports and self-organized movement contexts. To achieve these purposes, this study measured adolescents' basic psychological need satisfaction in three different movement contexts (PE, organized sports, and self-organized movement activity).

Method

Participants

3049 students (ages 13 and 16) from 42 different schools in the Norwegian counties of Aust-Agder, Vest-Agder, Oslo, and Østfold participated in the data collection, which took place in April and May 2014. Samples were drawn according to a cluster sampling procedure, with schools as the basic unit, and schools were stratified according to region, study program, number of students and centrality. 2854 adolescents provided information regarding their participation in different movement contexts and it was data from these adolescents that formed the basis for the herein presented analyses. There were less than 14% missing data points at the item level in these participants' responses. All participants were involved in PE, yet some adolescents did not participate in organized sport and/or self-organized movement activity during leisure time. Among the 2854 participants were: (a) 395 students who only participated in PE, referred to as "PE-only"; (b) 362 students who participated in PE and organized sport (OS), referred to as "PE/OS"; (c) 922 students who participated in PE and self-organized movement activity (SO), referred to as "PE/SO"; as well as (d) 1175 students who participated in PE, organized sport, and self-organized movement activity, referred to as "PE/OS/SO". Because all adolescents did not participate in all of the three movement contexts,

these four groups of adolescents were treated as separate subsamples in the analyses throughout the study.

Procedure

Data was collected in each of the schools during regular school hours using a web-based program for conducting electronic questionnaires. A project researcher was present during the data collection and was able to answer potential questions related to the survey. Students were informed that participation was voluntary and that they were free to withdraw from the study at any time without providing a reason. The completion of the questionnaire took approximately 60–90 min, and all questionnaire responses were anonymized. The proper permissions were received from the school principals and the Norwegian Centre for Research Data. With respect to participants who were younger than 15 years of age, parental consent was obtained. Adolescents who were 15 years or older were included in the study based on independent consent.

Instruments

Global Self-worth

To assess students' perception of global self-worth we employed one of the subscales from the revised Norwegian version (Wichstrøm, 1995) of Harter's Self-Perception Scale for Adolescents (SPPA; Harter, 1988). In line with Wichstrøm's (1995) revised version, the global self-worth subscale consisted of five different statements designed to tap into participants' perceptions of global self-worth (e.g., "I am often disappointed about myself"), and responses were anchored on a Likert scale from 1 (*Describes me very poorly*) to 4 (*Describes me very well*; Wichstrøm, 1995). Two contra-indicative items were reversed to ensure that higher scores on each item reflected higher global self-worth. The revised SPPA has shown better reliability and convergent and factorial validity than the original version, with a Cronbach's α of .77 (Wichstrøm, 1995).

Context Specific Basic Need Satisfaction

To measure participants' satisfaction of basic psychological needs in the contexts of physical education (PE), organized sport (OS) and self-organized movement activity (SO) the Basic Psychological Needs in Exercise Scale (BPNES; Vlachopoulos & Michailidou, 2006) was employed. The beginning of each item of the BPNES was modified to refer to the three contexts of examination. BPNES is comprised of 12 questions, and adolescents' satisfaction of the three basic needs of autonomy (4 questions, e.g., "Physical education classes are in agreement with my choices and interests"), competence (4 questions, e.g., "I feel that I have made a lot of progress in relation to the objective of physical education"), and relatedness (4 questions, e.g., "I feel very comfortable with the students in physical education") was measured on a seven point Likert scale ranging from 1; *totally disagree*, to 7; *very strongly agree*. Higher scores reflected higher levels of basic psychological need satisfaction. The BPNES is reported to be valid and reliable with alpha coefficients of .75, .80, and .86 for autonomy, competence, and relatedness, respectively (Vlachopoulos & Michailidou, 2006).

Statistical Analyses

Descriptive statistics for the overall sample were computed in IBM SPSS 24 and included bootstrapped bivariate correlations as well as bootstrapped means and standard deviations for all study variables. The correlations were interpreted according to Cohen's definitions (small $\geq .10$, medium $\geq .30$, and large $\geq .50$; Cohen, 1988). Bootstrapped means and standard deviations were also reported and interpreted for each subsample. Bootstrapped analyses were preferred given that they are considered robust across a variety of distributional assumptions (Erceg-Hurn & Mirsoevich, 2008; Wright, London, & Field, 2011). Mplus version 8.0 was applied for all further analyses.

To investigate the amount of total variance in all variables that were present on the school level, in comparison to the individual level, we calculated intra-class correlations (ICCs). Because the ICCs were small (0-4%) for all variables, we decided to exclude the school level from further analyses.¹

To compare the mean values of global self-worth and context specific autonomy, competence, and relatedness need satisfaction between the four subsamples, confirmatory factor analyses (CFAs) with a multi group specification were estimated using robust maximum likelihood in Mplus (MLR). MLR provides accurate estimates of the standard errors of non-normal variables (Muthén & Muthén, 1998-2017). We considered the missing data as missing at random (MAR) and used the full information maximum likelihood (FIML; Enders, 2010) estimation to handle the missing data. Separate models were estimated for each of the constructs. First, we tested measurement invariance between the groups by using a three step procedure; configural, metric, and scalar (Putnick & Bornstein, 2016). To test if a more restrictive invariant model showed acceptable fit to the data we, based on the recommendation of Chen (2007), used the following criteria: A change of $\geq -.010$ in the Comparative Fit index (CFI), supplemented by a change of $\geq .015$ in the Root Mean Square Error of Approximation (RMSEA) or a change of $\geq .030$ in the Standardized Root Mean Residual (SRMR). To evaluate if the specified model showed acceptable fit to data we used the following criterion: CFI $> .90$, RMSEA $< .08$, and SRMR $< .08$. For more information about these model fit indices see, for example, Little (2013). The Wald's test was performed to compare the latent mean values of global self-worth and contextual autonomy, competence, and relatedness need satisfaction between the subsamples. As only adolescents in two of the four subsamples (PE/OS and PE/OS/SO) participated in the organized sport context, the z-test was used to determine whether the latent mean values of adolescents' satisfaction of each of the basic psychological needs in organized sport were statistically different across the two subsamples. The same procedure was applied with respect to adolescents' satisfaction of each of the basic psychological needs in self-organized movement activity among adolescents who participated in this context (subsamples PE/SO and PE/OS/SO). In all analyses, a p -value $< .05$ was considered indicative of statistically significant group differences. Effect sizes were calculated and interpreted according to Cohen's definitions (Cohen's d , small $\geq .20$, medium $\geq .50$, large $\geq .80$; Cohen, 1988).

With respect to the second research question, structural equation modelling (SEM) was performed using the MLR estimator. The SEM analyses were used to determine the unique relation between the satisfaction of each basic psychological need in PE and global self-worth. To achieve this, separate models for autonomy, competence, and relatedness were specified. To control for students' sense of basic need satisfaction in the different leisure-time movement contexts where they took part, analyses were performed separately for each subsample. Given that also sex and school level (students' age) might influence the level of global self-worth, we included these as independent variables within all models. To evaluate the model fit, the same criterion as we used for the CFA were applied (see information above). The Wald's test was used to evaluate if there were statistically significant differences in the unique contributions from autonomy, competence, and relatedness need satisfaction in different movement contexts with respect to global self-worth. Also in these analyses, p -values below $.05$ were considered to indicate statistically significant results.

Results

As illustrated in Table 1, all variables included in the present study showed acceptable levels of internal consistency and small, medium or large correlation effects.

The CFAs for all variables, with scalar factorial invariance constrains specified, showed acceptable fit to data (for the model fit indices for the configural, metric, and scalar model specification see

¹Sensitivity analyses were performed using a two-level setup, and the potential differences between the one-level model and the two-level model were investigated. The inclusion of a two-level setup did not improve model fit nor substantially change the results.

Table 1. Descriptive statistics, bivariate correlations and Cronbach's alpha for the overall sample (all subsamples combined).

Variable		1	2	3	4	5	6	7	8	9	10
1	GSW	–	.33*	.41*	.38*	.27*	.33*	.25*	.26*	.31*	.31*
2	Autonomy PE		–	.81*	.61*	.30*	.30*	.27*	.28*	.30*	.29*
3	Competence PE			–	.78*	.42*	.46*	.39*	.43*	.45*	.41*
4	Relatedness PE				–	.41*	.43*	.46*	.41*	.42*	.45*
5	Autonomy OS					–	.87*	.80*	.47*	.47*	.41*
6	Competence OS						–	.80*	.49*	.51*	.44*
7	Relatedness OS							–	.41*	.43*	.42*
8	Autonomy SO								–	.90*	.75*
9	Competence SO									–	.75*
10	Relatedness SO										–
<i>M</i>		2.95	4.41	4.88	5.10	5.90	5.93	5.91	5.74	5.70	5.56
<i>SD</i>		.70	1.44	1.35	1.31	1.08	1.04	1.10	1.22	1.18	1.34
Cronbach's alpha		.84	.89	.90	.87	.89	.92	.86	.90	.92	.89

Note. Bootstrapped bivariate correlations, * $p < .01$ (two tailed); GSW = Global self-worth; PE = Physical education; OS = Organized sport; SO = Self-organized movement activity; *M* = Mean; *SD* = Standard deviations. Due to missing data and the fact that not all students participated in (and thus, reported basic need satisfaction in) all movement contexts, the *N* for bootstrapped bivariate correlations ranged from 886 to 2535 and the *N* for descriptive statistics ranged from 1352 to 2639.

Table 2). All factor loadings for all variables were statistically significant and ranged between .57 and .91.

The lower part of Table 3 shows the distribution of sex and school level in the four subsamples. With respect to the first research question, adolescents who only participated in PE (subsample PE-only) reported significantly lower levels of global self-worth compared to sports-active adolescents (subsamples PE/OS, $d = -.31$, and PE/OS/SO, $d = -.33$, see Table 3). No statistical difference was

Table 2. Model test fit indices for the invariance testing.

	Model tested	χ^2	<i>p</i>	<i>df</i>	CFI	Δ CFI	RMSEA (90% CI)	Δ RMSEA	SRMR	Δ SRMR
GSW	Model 1	125.66	<.001	20	.971		.087 (.072, .101)		.034	
	Model 2	162.02	<.001	32	.964	.007	.076 (.065, .088)	.011	.060	.026
	Model 3	186.64	<.001	44	.960	.004	.068 (.058, .078)	.008	.067	.007
Autonomy PE	Model 1	17.48	.03	8	.997		.042 (.014, .068)		.010	
	Model 2	32.91	.01	17	.994	.003	.037 (.017, .056)	.005	.029	.019
	Model 3	43.41	.02	26	.994	.000	.031 (.013, .047)	.010	.038	.008
Competence PE	Model 1	33.81	<.001	8	.990		.069 (.046, .094)		.016	
	Model 2	52.98	<.001	17	.986	.004	.056 (.039, .073)	.013	.030	.014
	Model 3	70.70	<.001	26	.983	.003	.050 (.036, .064)	.006	.028	.002
Relatedness PE	Model 1	64.28	<.001	8	.978		.102 (.079, .125)		.020	
	Model 2	77.53	<.001	17	.976	.002	.072 (.056, .089)	.030	.030	.010
	Model 3	92.97	<.001	26	.974	.002	.062 (.048, .075)	.010	.038	.008
Autonomy OS	Model 1	7.44	.11	4	.997		.035 (.000, .073)		.009	
	Model 2	11.67	.11	7	.996	.001	.030 (.000, .060)	.005	.035	.026
	Model 3	21.47	.02	10	.990	.006	.040 (.016, .063)	.010	.044	.009
Competence OS	Model 1	4.45	.35	4	1.00		.012 (.000, .059)		.006	
	Model 2	6.62	.47	7	1.00	.000	.000 (.000, .044)	.012	.019	.013
	Model 3	10.08	.43	10	1.00	.000	.003 (.000, .041)	.003	.023	.004
Relatedness OS	Model 1	20.65	<.001	4	.985		.076 (.046, .110)		.016	
	Model 2	25.73	<.001	7	.983	.002	.061 (.037, .087)	.015	.027	.011
	Model 3	32.14	<.001	10	.979	.004	.055 (.035, .077)	.006	.028	.001
Autonomy SO	Model 1	5.03	.28	4	.999		.017 (.000, .054)		.007	
	Model 2	8.49	.29	7	.999	.000	.015 (.000, .045)	.002	.028	.021
	Model 3	15.65	.11	10	.996	.003	.024 (.000, .047)	.009	.033	.005
Competence SO	Model 1	9.92	.04	4	.996		.040 (.007, .072)		.009	
	Model 2	12.37	.09	7	.997	.001	.029 (.000, .054)	.011	.012	.003
	Model 3	21.58	.02	10	.993	.004	.035 (.014, .056)	.006	.020	.008
Relatedness SO	Model 1	4.05	.40	4	1.00		.004 (.000, .050)		.007	
	Model 2	8.85	.26	7	.998	.002	.017 (.000, .046)	.013	.031	.024
	Model 3	12.72	.24	10	.998	.000	.017 (.000, .042)	.000	.035	.004

Note. GSW = Global self-worth; PE = Physical education; OS = Organized sport; SO = Self-organized movement activity; Model 1 = Configural; Model 2 = Metric; Model 3 = Scalar.

Table 3. Global self-worth and basic psychological need satisfaction among adolescents participating in different movement contexts.

	<i>M (SD)</i>				Effect size (<i>d</i>) for the difference, (X^2 , <i>p</i>)					
	Subsample PE-only	Subsample PE/OS	Subsample PE/SO	Subsample PE/OS/SO	PE-only vs. PE/OS	PE-only vs. PE/SO	PE-only vs. PE/OS/SO	PE/OS vs. PE/SO	PE/OS vs. PE/OS/SO	PE/SO vs. PE/OS/SO
GSW	2.84 (.71)	3.05 (.67)	2.83 (.72)	3.06 (.67)	-.31 (18.20, <.001)	.01 [†] (.03, <.87)	-.33 (32.41, <.001)	.31 (24.20, <.001)	-.02 [†] (.24, <.62)	-.28 (54.49, <.001)
Autonomy PE	3.85 (1.48)	4.50 (1.39)	4.16 (1.42)	4.77 (1.38)	-.47 (38.35, <.001)	-.22 (11.49, <.001)	-.67 (107.67, <.001)	.24 (16.33, <.001)	-.20 (8.40, <.01)	-.44 (91.24, <.001)
Autonomy OS	-	5.67 (1.17)	-	5.96 (1.05)	-	-	-	-	-0.28 ^a (<.001)	-
Autonomy SO	-	-	5.56 (1.28)	5.87 (1.16)	-	-	-	-	-	-0.27 ^b (<.001)
Competence PE	4.06 (1.44)	5.05 (1.23)	4.55 (1.35)	5.33 (1.19)	-.81 (98.73, <.001)	-.36 (34.03, <.001)	-1.07 (232.71, <.001)	.37 (37.01, <.001)	-.24 (15.47, <.001)	-.66 (174.10, <.001)
Competence OS	-	5.72 (1.10)	-	5.99 (1.06)	-	-	-	-	-.26 ^c (<.001)	-
Competence SO	-	-	5.50 (1.25)	5.83 (1.13)	-	-	-	-	-	-.29 ^d (<.001)
Relatedness PE	4.39 (1.44)	5.19 (1.26)	4.91 (1.34)	5.44 (1.16)	-.64 (63.52, <.001)	-.39 (37.23, <.001)	-.91 (149.22, <.001)	.21 (11.75, <.001)	-.22 (10.53, <.001)	-.46 (76.64, <.001)
Relatedness OS	-	5.74 (1.21)	-	5.96 (1.07)	-	-	-	-	-.21 ^e (= .001)	-
Relatedness SO	-	-	5.31 (1.39)	5.72 (1.31)	-	-	-	-	-	-.31 ^f (<.001)
n	395	362	922	1175						
Girls/boys, %	52/48%	43/57%	63/37%	47/53%						
LSS/USS, %	35/65%	61/39%	32/68%	67/33%						

Note. Latent mean comparisons between the four subsamples. GSW = Global self-worth; PE = Physical education; OS = Organized sport; SO = Self-organized movement activity; LSS/USS refers to the students' school level and thus, students' age. LSS = Lower secondary school (age 13); USS = Upper secondary school (age 16); *M (SD)* = Mean (standard deviations); - = No measures available; † = Difference is statistically non-significant. Cohen's *d*, small $\geq .20$, medium $\geq .50$, large $\geq .80$; (Cohen, 1988). *df* = 1 for all Wald's tests. For the models with two groups, the difference between the latent mean scores was tested by a z-test: ^az-value = 3.906, ^bz-value = 5.144, ^cz-value = 3.763, ^dz-value = 5.527, ^ez-value = 3.423, ^fz-value = 6.349.

identified in the level of global self-worth between adolescents who only participated in PE compared to adolescents who participated in PE and self-organized movement activity ($d = .01$). However, students who only participated in PE reported significantly lower levels of autonomy, competence, and relatedness need satisfaction in PE compared to all other adolescents in this study (subsamples PE/OS, PE/SO, and PE/OS/SO, see [Table 3](#) for effect sizes of the differences).

With respect to the second research question, all specified SEM models showed acceptable fit to data (see [Table 4](#)). The results showed that global self-worth was significantly related to autonomy, competence, and relatedness across all movement contexts, in all of the four subsamples. Also, for the PE/SO and PE/OS/SO subsamples, the Wald test showed that the association between competence need satisfaction in PE and global self-worth is more powerful compared to the association between competence need satisfaction in organized sports and global self-worth, and the association between competence need satisfaction in self-organized movement activity and global self-worth.

Discussion

Analyses showed that adolescents who only participated in PE (PE-only) and participants who were involved in PE and self-organized movement activity reported a lower level of global self-worth² and less basic need satisfaction in PE compared to adolescents who were active in sports. Previous research has identified an association between organized sports participation and global self-worth in adolescents (Nemček, Kraček, & Peráčková, 2017; Scarpa, 2011; Slutzky & Simpkins, 2009). However, according to Brettschneider (2001), such results may be explained by selection mechanisms and more complex designs are required to properly confirm the association between global self-worth and organized sport participation. The data on basic psychological need satisfaction in PE is in line with a body of research (e.g., Koka & Hein, 2003; Säfvenbom et al., 2015; Viira & Koka, 2012) that has suggested that students active in sports may have better prerequisites for development and learning in PE compared to students who are not active in sports, and especially students who are generally inactive.

With respect to the second aim of this study, analyses identified autonomy, competence, and relatedness in PE as significantly related to global self-worth among adolescents in all of the four subsamples. Further, basic need satisfaction in PE related to adolescents' global self-worth regardless of their leisure time involvements. As illustrated in the analyses for the subsamples PE/SO and PE/OS/SO, competence need satisfaction in PE appeared more strongly related to global self-worth compared to competence need satisfaction in organized sports and self-organized movement activity. This suggests that feelings of competence in school PE and leisure-time sport contexts relate differently to adolescents' global self-worth, and that PE is a central movement context with respect to the relationship between basic need satisfaction and global self-worth. Yet, this paper also shows that students experience less basic need satisfaction in PE than they do in leisure time movement contexts. As a whole, these findings highlight the importance of PE teachers emphasizing their students' basic need satisfaction in PE, as well as their students' global self-worth, when teaching PE.

Should there be a causal relationship between basic need satisfaction in PE and global self-worth, this study suggests that the potential for PE to promote global self-worth is more limited for adolescents who do not participate in movement activity outside school. The presence of significant differences in the level of basic need satisfaction in PE suggests that the PE subject may favor students who are involved in organized sport activities during leisure-time. This may indicate that the logic of PE coincides with the logic of organized sport, thereby adding support to the argument that Norwegian PE is characterized by a sports discourse (Kirk, 2013; Säfvenbom, 2010; Säfvenbom et al., 2015; Solenes, 2010). According to Mordal-Moen and Green (2014), PE teacher education has a propensity to attract students who share a prior interest in sports and games, and in many ways teacher

²The levels of global self-worth reported by adolescents in this study are comparable to those identified in a prior nationally representative study on Norwegian adolescents (Haugen et al., 2011).

Table 4. Relationship between context-specific autonomy, competence, and relatedness need satisfaction and global self-worth

	Subsample PE-only			Subsample PE/OS			Subsample PE/SO			Subsample PE/OS/SO		
	Aut	Comp	Rel	Aut	Comp	Rel	Aut	Comp	Rel	Aut	Comp	Rel
CFI	.98	.99	.96	.97	.97	.95	.98	.97	.96	.98	.97	.91
RMSEA [90% CI]	.04	.03	.06	.04	.04	.06	.04	.04	.05	.03	.04	.06
	[.02, .06]	[.00, .05]	[.04, .07]	[.03, .05]	[.03, .06]	[.05, .07]	[.03, .05]	[.04, .05]	[.04, .06]	[.03, .04]	[.03, .04]	[.06, .07]
SRMR	.04	.05	.05	.06	.06	.06	.05	.05	.04	.04	.04	.05
χ^2 (<i>p</i> -value)	65.53	54.85	91.93	138.06	145.43	193.30	202.48	239.54	279.68	332.07	409.42	810.04
	(.01)	(.08)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)
Sex ON Self-worth	.24	.23	.22	.34	.29	.32	.29	.26	.29	.31	.28	.31
	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(<.011)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)
Age ON Self-worth	.09	.10	.11	.03	.04	.04	.16	.17	.17	.07	.08	.10
	(.06)	(.05)	(.03)	(.62)	(.48)	(.41)	(<.001)	(<.001)	(<.001)	(.01)	(.01)	(<.001)
BPN in SO ON Self-worth	–	–	–	–	–	–	.16	.11	.14	.17	.12	.15
							(<.001)	(.01)	(<.001)	(<.001)	(.01)	(<.001)
BPN in OS ON Self-worth	–	–	–	.26	.18	.19	–	–	–	.16	.12	.10
				(<.001)	(.01)	(.01)				(<.001)	(.01)	(.02)
BPN in PE ON Self-worth	.25	.25	.31	.21	.30	.28	.24	.34	.30	.18	.30	.23
	(<.001)	(<.001)	(<.001)	(.01)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)
BPN in SO WITH BPN in OS	–	–	–	–	–	–	–	–	–	.51	.55	.45
										(<.001)	(<.001)	(<.001)
BPN in SO WITH BPN in PE	–	–	–	–	–	–	.27	.48	.52	.30	.50	.46
							(<.001)	(<.001)	(<.001)	(<.001)	(<.001)	(<.001)
BPN in PE WITH BPN in OS	–	–	–	.38	.48	.54	–	–	–	.29	.52	.51
				(<.001)	(<.001)	(<.001)				(<.001)	(<.001)	(<.001)
χ^2 (<i>p</i>) for pairwise comparisons												
BPN in PE vs. BPN in OS				1.13	.83	.71				.33	5.01	3.05
				(.29)	(.36)	(.40)				(.06)	(.03)	(.08)
BPN in PE vs. BPN in SO							1.04	10.81	4.09	.00	8.01	3.21
							(.31)	(.00)	(.04)	(.99)	(.01)	(.07)
BPN in OS vs. BPN in SO										.20	.11	.09
										(.65)	(.74)	(.77)
Adj. <i>R</i> ² Self Worth	.13	.13	.16	.27	.26	.27	.21	.26	.27	.25	.29	.26

Note. Aut = Autonomy; Comp = Competence; Rel = Relatedness; Sex = girls (1), boys (2); Age = distinguishes between students in upper secondary school, age 16 (1), and students in lower secondary school, age 13 (2); BPN in SO = Basic psychological need satisfaction in self-organized movement activity; BPN in OS = Basic psychological need satisfaction in organized sport; BPN in PE = Basic psychological need satisfaction in physical education; – = No measures available; *df* = 1 for all for all pairwise comparisons (Wald's tests). Standardized coefficients are reported. Sensitivity analyses were performed using a two-level setup, and the potential differences between the one-level model and the two-level model were investigated. As the inclusion of a two-level setup did not improve model fit nor substantially change the results, results from the one level setup are presented.

education does not have much impact on the beliefs and practices of prospective PE teachers. The resultant institutionalization and reproduction of a practice referred to as “physical education as sport techniques” (Kirk, 2010, p. 2) may easily be accompanied by a narrow understanding of ability, with teachers emphasizing neuromuscular functioning and athletic performance (Säfvenbom, 2010; Säfvenbom et al., 2015) instead of developmental processes, understanding, and learning among students. A PE subject based on a sport discourse that assesses students according to their performance of sport techniques is considered problematic for a variety of reasons (Stolz & Kirk, 2015), and our study adds support to these concerns. If adolescents who have the smallest repertoire of movement experiences also experience the lowest basic need satisfaction in a movement context that is important for global self-worth development, this undermines the developmental trajectory of an important group of students and may contribute to social inequity (Säfvenbom et al., 2015). If this is the case, PE violates the Norwegian Education Act that articulates the individual student’s right to an education that is adapted to his or her skills and capabilities (Opplæringslova [the Education Act], 1998, §1-3). This would mean that the current approach to PE fails to comply with the educational obligation to provide students with equal opportunities through equal education.

Strengths and Limitations

One of the major strengths of the current study is the large sample, consisting of 2854 adolescents, which allows for the exploration of independent subsamples. Another important strength was the use of SEM analyses that incorporate measurement error (Marsh & Hau, 2007). It should however be noted that the different sample sizes of the study’s four subsamples represents a limitation in the present study. Further, this study was based on self-reported measures, and findings may therefore be influenced by common method bias (Podsakoff, MacKenzie, & Podsakoff, 2012). The study is based on a cross-sectional design and inferences about cause and effect cannot be made based on the data presented herein. Pertaining to the issue of causality and development over time, experimental and longitudinal research designs are necessary to help us gain a deeper understanding of the relationship between basic need satisfaction in PE and global self-worth.

It should also be noted that while sex was identified as a significant predictor of global self-worth, the intention of this study was not to assess the role of sex with respect to adolescents’ global self-worth as such, but rather to rule out a potential confounder. Further, with respect to the effect sizes presented in this study, large differences in global self-worth across the different subsamples ought not to be expected as all four subsamples were drawn from a clinically healthy adolescent population (e.g., Bos, Muris, Mulken, & Schaalma, 2006). In terms of the amount of variance explained by basic need satisfaction in the different movement contexts concerning adolescents’ global self-worth, we urge the reader to keep in mind that school PE represents a relatively small school subject and a movement context where adolescents tend to spend no more than three school hours each week. We argue that one cannot expect large explained variances of basic need satisfaction in PE (or other movement contexts), yet that this does not make the role of basic need satisfaction in PE and leisure-time movement contexts any less interesting. We therefore encourage future research to pay more attention to those students who only involve in movement activity through mandatory PE. This group needs to be addressed in order to increase the understanding of why and how these adolescents experience their PE environment less satisfying in terms of basic needs and eventually, how PE may harm developmental processes in these students.

Conclusion

Results from the present study show that students who did not participate in leisure-time movement contexts experienced both less basic need satisfaction in PE and less global self-worth compared to sports active students. With respect to the major aim of this study, basic need satisfaction in PE related significantly to adolescents’ global self-worth. Findings even suggest that competence need

satisfaction in PE is more strongly related to global self-worth compared to competence need satisfaction in organized sports and self-organized movement activity. While this study cannot conclude on the causal direction of this relationship, results suggest that PE may indeed affect adolescents' global self-worth, as described in the PE curriculum. However, as a whole, this study shows that adolescents who are not involved in movement activity outside school experience significantly lower levels of autonomy, competence, and relatedness need satisfaction in PE compared to others, suggesting that these adolescents may have a reduced possibility for the development of global self-worth through PE. These findings highlight the importance of PE teachers emphasizing their students' basic need satisfaction in PE, as well as their students' global self-worth, when teaching PE. Should future research identify a causal relationship between basic need satisfaction in PE and students' global self-worth, our findings reveal a major pedagogical potential in PE with respect to the curricular objective of promoting global self-worth among all students. This study suggests that the curricular emphasis on students' global self-worth development through PE may require a didactic move "beyond the entrenched practice of physical education-as-sport techniques" and "the one-size-fits-all form of the subject" (Kirk, 2013, p. 978).

Disclosure statement

No potential conflict of interest was reported by the authors.

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