

Title

Adapting the Bernese Motive and Goal Inventory in leisure and health sports for people in adolescence and young adulthood (BMZI-JFEA)

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Abstract

Introduction

Although the benefits of physical activity are well known, especially adolescents and young adults have an above average dropout rate in physical activity (Lamprecht, Fischer, & Stamm, 2014). Being physically active in adolescence is strongly linked with lifelong exercise behaviour and, as a consequence, can lead to improved health and well-being. Therefore, the relevance of a specific exercise promotion for adolescents and young adults is clearly given.

However, target-group-specific interventions are rarely established to maintain and promote physical activity in adolescence and young adulthood. One neglected aspect in health and exercise promotion are personal sport-related motives and goals. Although first studies with motive-based tailoring of sports programmes increased the physical activity and had positive effects on well-being (Sudeck & Conzelmann, 2011). Motives can be defined as stable valuation dispositions across different situations and times. Thereby it can be distinguished between explicit and implicit motives (Brunstein, 2010). Implicit motives are not accessible to consciousness and can not be measured directly; whereas explicit motives are conscious and can be gathered through self-report.

One proven and theoretical based questionnaire eliciting motives and goals is the Bernese Motive and Goal Inventory for people from 35 to 64 years in middle adulthood (BMZI; Lehnert, Sudeck, & Conzelmann, 2011). The inventory consists of 24 items with seven dimensions (contact, competition/performance, distraction/catharsis, body/appearance, fitness/health, activation/enjoyment and aesthetics). However, an adaptation of the original BMZI is needed, because motives and goals vary across the lifespan (Trujillo, Brougham, & Walsh, 2004). From a developmental-psychological perspective and based on empirical findings following aspects should be complemented (Grob, 2007; Weiss & Williams, 2004): (1) Differentiation of fitness and health: Considering the current state of research a differentiation of fitness and health for adolescents and young adults can be assumed. With increasing age, the two aspects should begin to merge together. (2) Differentiation of body/appearance: In adolescence and young adulthood a growing importance of the body image can be observed. Therefore, the additional component of body forming should get increased attention. (3) New facet of risk/suspense: Adolescence can be characterised through changes in personality and behaviour. In physical activities young people especially tend to show more risk-taking behaviour and to search excitement. (4) Differentiation of competition/performance: Furthermore, performance enhancement and skill improvement are important aspects for adolescents and young adults to be physically active.

For this reason, the aim of the study is (1) to develop an appropriate questionnaire to assess the sport-related motives and goals of adolescents and young adults from 14 to 34 years (BMZI-JFEA) and (2) to validate the psychometric criteria of the inventory.

Methods

The study is embedded as part of the research project "sport-related motives and goals in adolescence and young adulthood – Adapting the Bernese Motive and Goal Inventory in leisure and health sports" supported by Swiss Federal Office of Sport (FOSPO). The project includes a pretest and three development phases (see table 1). Hereinafter, the results of study 2 and 3a are presented. The sample of Study 2 consisted of 717 adolescents and young adults (63% women). The age ranged from 14 to 34 years ($M_{\text{age}} = 19.95$, $SD_{\text{age}} = 3.95$). The sample was recruited through public and vocational schools, universities and companies providing services in Switzerland. To examine the retest-reliability another

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sample of 195 apprentices of a service company received twice an online-version at an interval of 2 weeks. The age ranged from 15 to 26 years ($M_{age} = 17.30$, $SD_{age} = 1.69$, 57% women).

For the item generation a systematic literature research in databases and a scanning of the existing inventory was conducted. Additionally to the 24 items of the original BMZI, the existing facets competition/performance, body/appearance, aesthetics and fitness/health were expanded with 9 items and risk and suspense experience as a new facet was complemented with 4 items. Study 2 consists of 37 items using a 5-point Likert Scale (from 1 = "I disagree" to 5 = "I strongly agree"). Additionally, to validate the discovered motives and goals the sport-related self-concordance (Seelig & Fuchs, 2006) was gathered.

Table 1

Review of the questionnaire development with sample description, steps of item reduction, goal and data analysis

Study	Sample	Steps of item reduction (dimensions)	Goals and data analysis
Pretest	$N = 165$	41 → 39 + 1 (9)	- Pretesting and communicative validation
1	$N = 651$	40 → 34 + 3 (9 → 8)	- Explore factorial structure and item reduction: EFA with principal axis factoring and a promax-rotation
2	$N = 717$	37 → 26 (8)	- Explore factorial structure and item reduction: EFA with principal axis factoring and a promax-rotation - Construct validity: ESEM with a geomin-rotation - Internal consistency: Cronbach's Alpha - Further construct validation with sport-related self-concordance, sex ¹ , age ¹ and life goals ¹ using bivariate correlation analyses with Pearson's Correlation coefficient
3a	$N = 195$	26 (8)	- Retest-reliability: bivariate correlation analyses with Pearson's Correlation coefficient
3b	$N =$	26	- Cross-validation and examination of the mess invariance for age and sex: ESEM with a target-rotation

Note. ¹Results were not reported.

First, an exploratory factor analysis (EFA) was conducted to explore the factorial structure using SPSS version 24 (see table 1). Second, an exploratory structural equation modeling (ESEM; Marsh, Morin, Parker, & Kaur, 2014) was carried out to confirm the factorial structure using Mplus 7. ESEM as a quiet new statistical analysis for questionnaire development integrates the advantages of EFA and confirmatory factor analysis (CFA). Traditionally, CFA typically does not allow cross-loadings and thus may lead to a distorted factorial structure. In comparison, ESEM incorporates cross-loadings, which represents the underlying structure more realistically and provides a better model fit. Third, Cronbach's Alpha was calculated to examine the internal consistencies of the found dimensions. Fourth, a further construct validation with sport-related self-concordance and an examination of the retest-reliability with bivariate correlation analyses (Pearson's Correlation coefficient) were conducted using SPSS version 24.

Results

An EFA with the preliminary data was conducted to identify underlying factors. Factor extraction based on an eigenvalue bigger than one, confirmatory examination of the scree plot and content-related considerations. A 8-factor-solution ($KMO = .844$, 76% explained variation) with 26 items was provided: contact, competition/performance, distraction/catharsis, body/appearance, fitness, health, aesthetics and risk/suspense. Furthermore, the ESEM confirms the 8-factor structure model with acceptable to good model fit indices (see table 2).

Additionally, a further examination of psychometric criteria was conducted. The internal consistency of the inventory can be classified as good to very good. Cronbach's Alpha ranged from .77 for competition/performance to .90 for contact. The test-retest-reliability over a 2-week period measured by Pearson's correlation coefficient ranged from $r_p = .62$ for fitness to $r_p = .81$ for competition/performance. To assess the construct validity of the inventory correlation analyses were

conducted with sport-related self-concordance which mostly revealed the assumed correlations. Purposed-centred motives and goals show negative correlations with intrinsic motivation (e. g. weight/appearance $r_p = -.104, p < .05$) whereas activity-centred motives and goals are characterised through positive correlations with intrinsic motivation (e. g. competition/performance $r_p = .519, p < .05$ and aesthetics $r_p = .446, p < .05$).

Table 2
Fit indices for the 8-factor model

Model	MLR- χ^2	Free parms	df	CFI	TLI	SRMR	RMSEA	90%-CI
8-factor-model	718.775	464	290	.955	.900	.024	.064	.058-.070

Note. MLR = Robust Maximum-Likelihood-Estimation by Yuan-Bentler; df = Deviation of Freedom; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Standardized Root Mean Square Residual; RMSEA = Root Mean Square Error of Approximation; 90%-CI = 90-Percent-Confident interval for RMSEA.

Discussion/Conclusion

A first validation of the BMZI-JFEA shows a good model fit and is with 26 items an economic inventory. In comparison with the original BMZI a new aspect risk/suspense and a separation of fitness and health was discovered. On the other hand, no clear dimension activation/enjoyment was found. However, a cross-validation is necessary to confirm the factorial structure of the sport-related motives and goals, especially due to the unbalanced gender ratio and relatively young sample for the target group. Furthermore, examining measurement invariance of age and gender is intended. Additionally, the retest-reliability over a 2-week period should be conducted with a more representative sample to provide an explanation for the partially low retest-reliability. Furthermore, based on the BMZI-JFEA the building of motive-based types of sportsperson for adolescents and young adults is planned. With the adapted BMZI-JFEA, the original BMZI and the BMZI for older adulthood (Schmid, Molinari, Lehnert, Sudeck, & Conzelmann, 2014) an age-specific individual diagnosis of sport-related motives and goals across the whole lifespan from 14 to 85 years will be possible.

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