

# Discriminant validity of the positive and negative processes in the C–A–P Questionnaire

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## ABSTRACT

Globally, youth sport is highly valued and prevalent. Coaches, athletes, and parents are the main players. To date no one measure quantifies these vital interactions. To rectify this surprising omission, the Positive and Negative Processes in the C–A–P Questionnaire (PNPCAP) was developed in the Lithuanian language. This study sought to further the development of the PNPCAP by providing evidence for discriminant validity. To achieve this purpose, 192 females (M age = 13.64, SD = 1.59) and 239 males (M age = 14.02, SD = 1.50) completed the PNPCAP measure along with the Perceptions of Success Questionnaire, Sport Climate Questionnaire, Self-Determination Scale and provided some youth sport participation information. The resultant correlation matrix provided evidence of discriminant validity as the pattern verified the hypothesized relationship in that positive and significant correlations were found with the C–A–P positive process scale and the task orientation, self-determined awareness of self and perceived choice, and perceived autonomy support. Negative and significant correlations were found with the C–A–P negative process scale and the task orientation, self-determined awareness of self and perceived choice, and perceived autonomy support. Researchers are encouraged to translate and use the PNPCAP in youth sport settings to better the youth sport experience for athletes and their parents and coaches.

**Keywords:** Questionnaire development; Youth sport; Coaches; Parents; Athletes; Relationships.

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## INTRODUCTION

Unquestionably, youth sport participation is valued worldwide. Grassroot sports thrive globally. Within the youth sport environment, coaches, parents, and youth athlete routinely interact (Dorsch, Smith, and McDonough, 2009; Camiré, Trudel, and Forneris, 2012). Hence, measuring these interactions is of great value to better the youth sport experience. Many questionnaires exist measuring aspects of the youth sport experience, such as the Coach–Athlete Relationship Maintenance Questionnaire (Rhind and Jowett, 2012), the Coach Created Empowering or Disempowering Coaching Questionnaire (Appleton, Ntoumanis, Qusted, Viladrich, and Duda, 2016), and the Parent and Family Adjustment Processes (Sanders, Morawska, Haslam, Filus, and Fletcher, 2013). However, no one questionnaire uses the same statement stem and questions to measure the youth sport experience from the perspectives of coaches, parents, and athletes. Thus, Lisinskiene and her colleagues developed the Positive and Negative Processes in the C–A–P Questionnaire (PNPCAP) via both qualitative (Lisinskiene, May, and Lochbaum, 2019b) and quantitative methodology (Lisinskiene, Lochbaum, May, and Huml, 2019a).

The PNPCAP is an 11-item measure with two subscales. One subscale represents worldwide valued positive processes within the C–A–P such as trust while the other subscale represents generally viewed in youth sport as negative processes with the C–A–P such as over-involvement. The qualitative portion of the PNPCAP development, Lisinskiene and her colleagues (2019b) conducted two studies. In the first qualitative study, 136 research participants were surveyed asking for written statements concerning C–A–P subscale like topics such as respect, communication, over-involvement, and demotivation. In the second phase, a follow up phenomenological study design was conducted concerning the findings of the first qualitative study. For the phenomenological study, 10 coaches, 10 athletes, and 10 youth sports parents completed in-depth interviews. Based on both qualitative study results, the following three C–A–P themes emerged: group processes, motivation, and over-involvement. The two qualitative investigations revealed 8 themes and 48 potential usable questions (6-items per theme) to develop a C–A–P questionnaire for psychometric evaluation. Thus, in their quantitative work, two studies were conducted. In the first study, the 48-item measure was investigated with 308 participants. Analyses resulted in 15 items that the researchers fit into two dimensions, positive and negative group processes. Continuing with refinement of their measure, Lisinskiene and her colleagues (2019a) in the second study had 678 participants completed the newly refined 15-item measure. After extensive analyses 11 items remained. Lisinskiene and colleagues (2019b) renamed the questionnaire to the Positive and Negative Processes in the Coach–Athlete–Parent Questionnaire (PNPCAP).

One important step in questionnaire development process is to verify discriminant validity. To date, the PNPCAP has not undergone such analysis. Thus, the purpose of this study was to examine the discriminant validity of the PNPCAP. To achieve this purpose, a few appropriate measures within theoretical frameworks used extensively in the youth sport context, namely Self-Determination Theory (Zanatta, Rottensteiner, Konttinen, and Lochbaum, 2018) and Achievement Goal Theory (Lochbaum, Kazak Çetinkalp, Graham, Wright, and Zazo, 2016; Lochbaum, Zazo, Kazak Çetinkalp, Graham, Wright, and Konttinen, 2016), were collected along with the PNPCAP. It was expected that the C–A–P positive process scale with the task orientation, self-determined awareness of self and perceived choice, and perceived autonomy support and the C–A–P negative process scale with the task orientation, self-determined awareness of self and perceived choice, and perceived autonomy support and potentially a positive correlation with the ego goal orientation.

## MATERIALS AND METHODOLOGY

### **Participants**

The participants were recruited from seven general sports education schools in Kaunas, and in Vilnius, Lithuania as well as from two individual and team sports federations. Demographic information and some additional information was collected from each participant. Overall, 192 females and 239 males completed the measure and reported fairly similar characteristics. Specifically, the females ranged in age from 11 to 19 (M age = 13.64, SD = 1.59) corresponding to grades 5 through 12 (M grade = 7.78, SD = 1.57). The females reported sports club experience from 1 to 6 years (M year experience = 3.50, SD = 1.85). The males ranged in age from 11 to 18 (M age = 14.02, SD = 1.5) that corresponded to grades 5 through 12 (M grade = 8.11, SD = 1.51). Concerning sports clubs experience, the males indicated from 1 year to 6 years (M year experience = 4.27, SD = 1.90). When completing the section sport type section, 88 indicated individual and 151 indicated team.

### **Instrumentation**

The following self-evaluations were completed by the participants in the Lithuanian language. The Positive and Negative Processes in the C–A–P Questionnaire (PNPCAP) is an 11-item measure assessing the interpersonal relationships among the coach, athlete, and parents in both team and individual sport settings. The scale was made with coach, athletes, and parents in the sport club context and has shown acceptable psychometric properties (Lisinskiene, Lochbaum, et al., 2019a). Respondents are asked to complete the 11 items with 7 representing positive processes (e.g., Mutual respect characterizes my C–A–P and My C–A–P is supportive.) and 4 representing negative processes (e.g., At least one member in my C–A–P oversteps boundaries and At least one member in my C–A–P is too demanding). The response set is from 1 (Totally Disagree) to 5 (Totally Agree).

The Perception of Success Questionnaire (POSQ) is a 12-item measure (Roberts et al., 1998) assessing two achievement goal orientations, task and ego, with excellent psychometric properties. Each goal orientation is measured with 6 items. An example task orientation item is “I show clear personal improvement” and an example ego orientation item is “I show other people I am the best”. The POSQ has been used extensively in many countries (Lochbaum et al., 2016a, 2016b). To date the POSQ has not been used in the Lithuanian language. Thus, in the present study, forward and backward translation procedures were used, and psychometric property analyses were conducted. Confirmatory factor analysis (CFA) revealed acceptable model fit for ego and task-related factors (CFI = .94, SRMR = .07, RMSEA = .08), therefore achieving the model fit standards set out by Hu and Bentler (1999). This model fit was accomplished using a six-item factor for the ego and six-item factor for task goal orientations. The response set is used was from 1 (Strongly Disagree) to 5 (Strongly Agree).

The Self-Determination Scale (SDS) is a 10-item measure assessing individual differences in self-determined functioning (Sheldon and Deci, 1996) comprised of two 5-item subscales, awareness of feelings and sense of self and has been used in the Lithuanian language (Ramonaitė, 2012). Participants are first asked to read two statements one labelled as “A” and the other as “B” one of which representing functioning fully self-determined and the other functioning not self-determined. Next, respondents’ rate from 1 (Only A feels true to 5 only B feels true). An example question set for the perceived choice subscale is A. I always feel like I choose the things I do and B. I sometimes feel that it is not really me choosing the things I do. An example question set for the awareness of feelings subscale is A. My emotions sometimes seem alien to me and B. My emotions always seem to belong to me. All the perceived choice must be reversed scored.

The Sport Climate Questionnaire (SCQ) is a 15-item questionnaire (Sport Climate Questionnaire, n.d.) assessing athlete perceptions of coach created autonomy support climate and as with the SDS has previously been used in the Lithuanian language (Ramonaitė, 2012). Originally made in English, the scale has been successfully translated such as in Spanish (Balaguer, Castillo, Duda, and Tomás, 2009). Example statements are “I feel that my coach provides me with choices and options” and “I feel that my coach accepts me”. The response set is used was from 1 (Strongly Disagree) to 7 (Strongly Agree).

### **Procedure**

An approved human subject approval from the first author’s university was presented to all participants at the beginning of the web-based survey. The researchers’ first contacted parents or legal guardians of all participants to provide information on the study, background of previous research related to the study at-hand, potential benefits, and risks, and answered any questions. Parents of all included athletes provided adult consent. A web-based youth-specific survey link was sent by the principal of the respective sport schools to the parents (who provided consent) who then provided this link to the youth or youths in their household. A week after the survey was initially disbursed, a follow-up e-mail was sent as a reminder. Two weeks after the initial survey, the survey link was closed.

### **Data analysis**

To examine and verify PNPCAP discriminant validity, correlations were examined between the PNPCAP factors and the POSQ, SCQ, and SDS based on the specific hypothesized forwarded. Cronbach’s alpha coefficient was used to evaluate internal consistency and effect size values were calculated when appropriate. Cohen’s (1990) interpretation for computed effect size differences criteria were used with 0.20 as small, 0.50 as medium, 0.80 as large, and 1.30 as very large. Additionally, exploratory factor analysis (EFA) using a principal axis factoring with a varimax rotation (with Kaiser normalization) was performed on SCQ and SDS to ensure the appropriateness of both scales’ psychometric properties. An EFA was performed instead of confirmatory factor analysis (CFA) because the EFA provides a better distinction of how factors load from a bundle of items instead of correlation between latent constructs. All the factors reported above a 1.0 eigenvalue score (SCQ: 4.256, SDS-Awareness: 2.379, SDS-Choice: 1.933), which is the recommended cut-off value for stand-alone factors within an established instrument (Hinkin, 1995). All item factor loadings achieved an acceptable threshold, ranging from .491 to .793. Factor correlation scores ranged from .24 (SCQ to SDS-Awareness) to .25 (SDS-Awareness to SDS-Choice). These correlations between factor scores fall below the maximum recommended threshold of .70, meaning that each factor is distinct from the others within the instrument (Costello and Osborne, 2004)

## **RESULTS**

The descriptive data for and correlations among all study variables are in Table 1. All the scales had acceptable to excellent internal reliability coefficients (i.e., > .70). Participants self-reported more positive processes on average than negative processes in their C–A–P. The meaningfulness of difference was very large ( $d = 1.80$ ). Participants on average endorsed the task more than the ego goal orientation. As with the effect size difference between the two C–A–P processes, the effect size between the two goal orientations was very large ( $d = 1.55$ ). Participants reported more self-determined awareness of self than perceived choice and this difference was medium in meaningfulness ( $d = .64$ ). Last, based on the 1 to 7 response scale, participants self-reported on average a sense but certainly not a strong sense of their coach providing autonomy support.

Concerning the main purpose of this study, to verify discriminant validity of the two C–A–P processes, the correlation matrix was examined relative to our stated hypothesized. Positive and significant correlations were found as hypothesized with the C–A–P positive process scale with the task orientation, self-determined awareness of self and perceived choice, and perceived autonomy support confirming our expectation that a positive C–A–P is associated with adaptive motivations and coaching support. Negative and significant correlations were found as hypothesized with the C–A–P negative process scale with the task orientation, self-determined awareness of self and perceived choice, and perceived autonomy support confirming our expectation that a perceived negative C–A–P is associated negatively with adaptive motivations and coaching support. No significant correlations were found with the ego goal orientation and either of the C–A–P scales.

Table 1. Descriptive statistics, internal consistency and correlation analysis for all study questionnaires.

	1	2	3	4	5	6	7
1 Positive processes (PNPCAP)	1						
2 Negative processes (PNPCAP)	-.200*	1					
3 Task orientation (POSQ)	.361*	-.127*	1				
4 Ego orientation (POSQ)	.026	.049	.407*	1			
5 Awareness of self (SDS)	.227*	-.257*	.201*	.019	1		
6 Perceived choice (SDS)	.329*	-.153*	.194*	.008	.229*	1	
7 Autonomy support (SCQ)	.357*	-.258*	.252*	.017	.762*	.805*	1
Scale range	1 to 5	1 to 7					
Mean	3.99	2.75	4.06	3.08	3.9	3.35	3.63
Standard deviation	0.64	0.73	0.5	0.74	0.81	0.89	0.67
Cronbach alpha	0.87	0.71	0.75	0.88	0.76	0.74	0.84

Note: \* $p < .01$ ; PNPCAP = Positive and Negative Processes in the C–A–P Questionnaire; POSQ = Perception of Success Questionnaire; SDS = Self-Determination Scale; SCQ = Sport Climate Questionnaire.

## DISCUSSION

The PNPCAP is a valid brief measure for assessing interpersonal relationships among coaches, athletes, and parents in the youth context. Extensive qualitative and quantitative research by Lisinskiene and her colleagues (Lisinskiene et al., 2019a; Lisinskiene et al., 2019b) went into developing the PNPCAP. Even with the initial results supporting the structure of the PNPCAP, discriminant validity had yet to be examined. This study examined evidence for the discriminant validity of the PNPCAP with a few measures based on the two dominant theoretical frameworks, Achievement Goal Theory and Self-Determination Theory, in youth sport.

The results can be considered as evidence for providing discriminant validity for both PNPCAP subscales. However, as with most if not all studies, this had limitations. As designed, the PNPCAP can be answered by coaches, parents, and athletes. This study only examined youth sport athlete responses. Thus, discriminant validity of the PNPCAP should be conducted on samples of coaches and parents. Additionally, the study sample though large was a convenience sample limited to only Lithuanian youth sport participants.

## CONCLUSIONS

Grassroots sports are found globally. Certainly, grassroots sports involving youths require parents, coaches, and the youth to interact. Ensuring an adaptive atmosphere in which the youth can thrive is paramount. The PNPCAP is a questionnaire allowing for the assessment of the sport atmosphere. Currently, the questionnaire

is in both the English and Lithuanian languages though tested to date with only Lithuanian samples. Given youth sport is global and the dynamics among coaches, athletes, and parents are of great importance, future research should concurrently examine the PNPCAP with coaches, parents, and athletes in more than one country.

## AUTHOR CONTRIBUTIONS

Ausra Lisinskiene: study design, data collection and secured funding. Matt Huml: statistical analysis and manuscript preparation. Marc Lochbaum: study design, statistical analysis and manuscript preparation.

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## DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

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