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INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

**TITLE: Perceptions about Quality of Interpersonal Processes and Practice Activities in
Youth Sport are Interdependent**

Short Title: INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

Enrique García Bengoechea*¹, Philip M. Wilson², Steven Dunn³

¹Physical Activity *for* Health Research Cluster
Health Research Institute
Department of Physical Education and Sport Sciences
F2-125 Foundation Building, University of Limerick,
Limerick, Ireland
E-mail: enrique.garcia@ul.ie
Tel + 353 61 202547

ORCID number: 0000-0003-2899-8047

²Department of Kinesiology
Brock University
500 Glenridge Ave, St. Catharines, Ontario L2S 3A1, Canada
E-mail: phwilson@brocku.ca
Tel: +1 (905) 688-5550 ext. 4997

³Department of Athletics
Bishop's University
2600 Rue College, Sherbrooke, Quebec, J1M 0C8, Canada
E-mail: sdunn@ubishops.ca
Tel: + 1 (819) 563-0770 ext. 22083

*Corresponding author

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

Abstract

Despite calls in the literature, little is known about how dimensions of a social and task nature relate to each other in school and out-of-school learning environments. This study explored whether interpersonal and task dimensions of the youth sport environment, as perceived by young people, are related, and, if so, how they are related. We used data from 310 adolescent sport participants from eastern Canada ($M_{\text{age}} = 14.69 \pm 1.60$ years; 54.8 % girls). Participants completed comprehensive assessments of interpersonal dimensions of the sport environment and the characteristics of learning activities they do in practices. We used canonical correlation analysis to examine the multivariate shared relationship between the variable sets. The relationship was largely captured by the first three functions in the canonical model. The first two functions revealed areas of intersection between perceptions of interpersonal and practice-based activity factors in the form of supports and challenges for the learning and development process in sport. Accounting for the participants' age, the third function displayed characteristics consistent with recent descriptions of complex environments in youth sport. The findings suggest that adolescents' perceptions of interpersonal- and task-related features of sport are interdependent, and highlight the relevance of including variables assessing both factors in studies that attempt to characterize and understand learning environments in sport and other achievement domains. Findings also afford new insights into whether dimensions of a social and task nature are complementary, and inadequacies in one dimension can be attenuated by strengths in another or not.

Keywords: interpersonal context, practice, learning environment, youth sport, canonical correlation analysis

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

Perceptions about Quality of Interpersonal Processes and Practice Activities in Youth Sport are Interdependent

Contemporary views on human development are grounded in relational assumptions that portray individuals as intentional beings that develop through dynamic exchanges within the multiple levels of organization that constitute the ecology of human development (Lerner, 2015). Influential approaches to human development, such as Bronfenbrenner's bioecological model (Bronfenbrenner, 2005), and Activity Theory (e.g., Vygotsky, 1981; Wells, 2004), highlight the joint role of interactions with other people and participation in activities as key proximal processes through which human development takes place. Notably, what people become depends on the company they keep and what they do together (Wells, 2004). Furthermore, the diversity of an individual's development depends on the particular activities in which he/she jointly participates with others (e.g., Wells, 2004). Similarly, motivational theorists, such as Deci and Ryan (1985), have argued that, in addition to understanding the role of social contextual factors, an explanation of human development and motivation requires a fuller appreciation for the concept of activity.

Early work on the classroom learning environment guided by achievement goal theory provides a rare example of research considering both interpersonal and activity dimensions to understand the emergence of qualitatively different patterns of motivation in young people (Ames, 1992a). Specifically, Ames (1992a) used the concept of 'classroom structures' to identify dimensions of classrooms that affect how students approach and engage in learning. These structures are mainly reflective of activity contextual dimensions in some cases (e.g., the design of tasks and learning activities), and of social contextual dimensions in others (e.g., evaluation practices and use of rewards, and distribution of authority or responsibility). Furthermore, as Ames (1992a) noted, although classroom structures are interdependent, the issue of how these structures relate specifically to each

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

other remains a research question worthy of further consideration. In particular, Ames (1992a) drew attention to the importance of investigating whether classroom structures are complementary, and inadequacies in one structure can be attenuated by strengths in another, or not, in which case structures cannot compensate for each other (see also Ntoumanis & Biddle, 1999).

The work of Ames (1992a, 1992b) was at the origin of a conceptualization of the learning environment in sport in terms of a number of related activity contextual and social contextual features organized with respect to the acronym TARGET (task, authority, recognition, grouping, evaluation, time). These features are thought to characterize the existing 'motivational climate' by making different achievement goals salient and foster different motivational orientations (Ames, 1992a, 1992b).

The motivational climate in sport has been operationalized mainly in terms of social contextual dimensions of the environment (e.g., Duda, 2013; Newton et al., 2000; Seifriz et al., 1992; Smith et al., 2008; O'Rourke et al., 2013). Notably, a task-involving or mastery climate has been described as one that reinforces effort and self-referenced improvement, and where mistakes are seen as a valuable instrument for learning (Newton et al., 2000; O'Rourke et al., 2013). Conversely, an ego-involving climate has been defined as an environment where winning is emphasized, success is achieved through favourable comparison with others, greater attention is paid to the most skilled athletes, and mistakes are negatively evaluated and frequently punished (Newton et al., 2000; O'Rourke et al., 2013). Duda (2013) has recently proposed a conceptualization of the motivational climate in youth sport that integrates key social environmental dimensions from self-determination theory and achievement goal theory. Such dimensions are reflective of empowering and disempowering features prevailing in the social environment, namely whether the environment created by

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

coaches and other leaders is task involving, autonomy and socially supportive, or, on the other hand, ego-involving and controlling.

The emphasis on social contextual aspects of learning environments in youth sport has yielded important insights into interpersonal factors that affect participant motivation and psychosocial development. However, this emphasis may have prevented researchers from considering how relevant social contextual and task features of the environment relate to each other and influence the sport experience of young people.

Some evidence of an association between perceptions of interpersonal and task dimensions of the youth sport environment was found in a study that identified groups of adolescent with similar profiles based on factors related to quality of interpersonal processes and practice activities (Bengoechea, Wilson, & Dunn, 2017). Specifically, three environmental patterns were identified and labelled, ‘positive context’, ‘negative context’, and ‘complex context’, respectively. Further, each pattern was differentially associated with indices of enjoyment, perceived competence and commitment to sport. However, it is still unclear how perceptions of interpersonal and task factors relate specifically to each other in sport and other achievement contexts relevant to youth development and socialization. Since engagement patterns of participants in achievement settings are shaped by how task and social dimensions interact in those settings (Ames, 1992a), this may be an important oversight.

The aim of this study was to examine whether perceptions of selected interpersonal and task dimensions of the sport environment are related in a sample of adolescent sport participants and, if so, how they are related. Given the scarcity of work in this area, and the exploratory nature of this study, we only advanced general hypotheses concerning the interpersonal and practice-based activity factors examined by Bengoechea, Wilson, and Dunn

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

(2017). Thus, we expected interpersonal dimensions generally considered favourable in terms of their psychosocial implications (e.g., support and encouragement, positive feedback about one's ability, emphasis on learning and effort, role modelling) to be positively associated with desirable characteristics of practice activities (e.g., variety and interest, usefulness) and negatively associated with undesirable characteristics (e.g., repetition and boredom, ineffectiveness). Similarly, we expected interpersonal dimensions deemed unfavourable as to their psychosocial implications (e.g., control and excessive demands, negative feedback about one's ability, emphasis on performance and winning) to be positively associated with undesirable characteristics of practice activities and inversely related to desirable activity characteristics. These predictions were broadly aligned with the thesis that interpersonal and task dimensions are not complementary (i.e., they cannot compensate for each other).

Method

Participants and Procedures

This study was based on a sample of 310 adolescents (54.8% girls), aged 12-17 years ($M_{age} = 14.69$, $SD = 1.60$ years) who provided data for the initial validation of the Interpersonal Context in Youth Sport Questionnaire (ICYSQ, Bengoechea, Sabiston, & Wilson, 2015) and the Activity Context in Youth Sport Questionnaire (ACYSQ, Bengoechea, Sabiston, & Wilson, 2017) instruments. Participants were recruited from three high schools within one regional school district in a mixed rural-urban location (93.9%), and from a community college in a metropolitan area (6.1%) in an eastern province in Canada.

Briefly, the researchers contacted school board administrators and school principals to explain the study. Once permission to collect data was granted, a trained research assistant explained the study to potential participants and scheduled for the administration of the study survey, usually during regular physical education classes. Participants provided written assent

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

and parental consent as required by the appropriate ethics review board. Research assistants were the only adults present during the administration of the survey to study participants.

The participants had varied backgrounds with respect to sports practiced and level of competition, with 269 participants (86.8%) taking part in team sports and 41 (13.2%) in individual sports. Furthermore, 187 participants (60.3%) competed at the regional level and 123 (39.7%) at the provincial or national level. Participants reported training 5.43 hours per week ($SD = 3.36$ hours/week) on average.

Measures

Demographics. Participants self-reported their age and gender, the sport they took part in and the number of hours of training per week and level of competition.

Perceptions of task dimensions of the sport environment. Perceptions of task dimensions of sport participation were assessed by means of the 20-item ACYSQ (Bengoechea, Sabiston, & Wilson, 2017). This instrument provides an evaluation of selected characteristics of the activities adolescents take part in during sport practices. The instrument displayed appropriate psychometric properties in terms of factor structure/dimensionality, internal consistency reliability of each subscale, and criterion validity based on associations with indices of enjoyment, perceived competence and commitment in sport (Bengoechea, Sabiston, & Wilson, 2017). In its current form, the ACYSQ includes five subscales: (a) Stimulation (sample item: “We do exciting things in practice”); (b) Value/Usefulness (sample item: “I learn about my strengths and weaknesses through the skills I perform in practice”); (c) Authenticity (sample item: “The activities we do let me try new ways of doing things”); (d) Repetition/Boredom (sample item: “We keep doing the same things over and over during practices”); and (e) Ineffectiveness (sample item: “I don’t learn anything new in practices”). Response options were anchored on a 7-point scale ranging from “Not at all true” to “Very

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

true.” In this study, Cronbach’s alpha (α) estimates of internal consistency score reliability for ACYSQ subscales ranged from 0.72 to 0.89 ($M_{\alpha} = 0.81$; $SD_{\alpha} = 0.08$; see Table 1).

Perceptions of interpersonal dimensions of the sport environment. The participants completed the ICYSQ (Bengoechea et al., 2015), an instrument designed to offer a comprehensive assessment of interpersonal processes in youth sport regardless of source of influence. In its current form, the ICYSQ consists of 43 items, which represent the following 12 dimensions: (a) Support and Encouragement (sample item: “There are people who encourage me to follow my dreams in sport”); (b) Social Interaction (sample item: “There are people that I like to be around”); (c) Positive Ability Information (sample item: “There are people who think that I am a very skilled athlete”); (d) Learning and Effort (sample item: “There are people who encourage me to have goals to work toward”); (e) Role Modelling (sample item: “There are people who I look up to and want to be like”); (f) Observational Learning (sample item: “There are people that I try to learn from when I watch them play or perform”); (g) Comparison and Competition (sample item: “There are people that I want to test my skills against to see how good I am”); (h) Pressure/Expectations (sample item: “There are people whose expectations I try to live up to”); (i) Control and Demands (sample item: “There are people who push me to do things their way”); (j) Negative ability Information (sample item: “There are people who think I lack the necessary skills to excel in sport”); (k) Performance and Winning (sample item: “There are people who criticize me when I mess up or make mistakes”); and (l) Negative Work Attitude (sample item: “There are people around me who don’t take the sport seriously”). Response options used a 7-point scale ranging from “Not at all true” to “Very true.”

Similar to the ACYSQ, the ICYSQ demonstrated appropriate psychometric characteristics in terms of factor structure/dimensionality, internal consistency reliability of each subscale, and criterion validity based on associations with indices of enjoyment, perceived

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

competence and commitment in sport (Bengoechea et al., 2015). Cronbach's α estimates of internal consistency score reliability for ICYSQ subscales in this study ranged from 0.71 to 0.90 ($M_\alpha = 0.78$; $SD_\alpha = 0.05$; see Table 1).

Data Analysis

As a preliminary step, we screened data for out of range values and inspected missing values to discern any systematic patterns of non-response. We then calculated Pearson correlations to examine the bivariate associations between task-based and interpersonal dimensions of the youth sport environment. Subsequently, we conducted a canonical correlation analysis (CCA) using the five task-related variables as predictors of the 12 interpersonal variables to evaluate the multivariate shared relationship between the two variable sets. One of the critical advantages of multivariate techniques such as CCA is that they limit the probability of committing Type I error within the study. In addition, by illuminating relationships among variables that possibly have multiple causes and effects, multivariate techniques such as CCA may best represent the complex reality of human behaviour and cognition, and of applied social psychological research (Sherry & Henson, 2005). Considering the age range of participants in this study, analyses accounted for potential effects of this variable on the CCA model. Similarly, gender was accounted for in light of its pervading and powerful influence in the sport domain (see Gill, 2007). Since age and gender could contribute to the prediction of both interpersonal and task-related variables, we first included age and gender in the CCA model together with the task-related variables. Subsequently we tested a model in which the demographic variables were included alongside the interpersonal variables. Further, we conducted a sensitivity analysis to determine the extent to which inclusion of number of hours of training per week and level of competition (regional vs provincial and national) affects the model. Analyses were conducted using SPSS version 22.0.

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

Results

No out of range responses were evident in the preliminary screening. Missing data were detected in 15 ACYSQ and 27 ICYSQ items. Missing data percentages ranged between 0.3 and 2.6, and between 0.3 and 2.3, respectively. We used multiple imputation in the context of a factor analysis model to replace all missing values (Enders, 2010).

Bivariate correlations between task and interpersonal variables are shown in Table 1. Correlations ranged between $-.001$ and $.57$. At the bivariate level, the strongest correlations corresponded to the association between Value/Usefulness and Learning and Effort ($r = .57$), Stimulation and Support and Encouragement ($r = .51$), Repetition/Boredom and Control and Demands ($r = .47$), Repetition/Boredom and Negative Ability Information ($r = .47$), and Value/Usefulness and Observational Learning ($r = .45$) (all $p < .01$).

Collectively, the full CCA models across all functions (seven and five, respectively) were statistically significant using the Wilks's $\lambda = .220$ criterion, $F(84, 1790.25) = 5.97$, $p < .001$ (model 1) and the Wilks's $\lambda = .237$ criterion, $F(70, 1389.52) = 7.02$, $p < .001$ (model 2). Since Wilks's λ represents the variance unexplained by the model, $1 - \lambda$ yields the full model effect size in an r^2 metric (Sherry & Henson, 2005). Thus, for the corresponding sets of canonical functions, the r^2 type effect size was $.78$ (model 1) and $.76$ (model 2), which indicates that the full models explained a substantial and similar portion, about 78% and 76%, of the variance shared between the variable sets. As noted, the full models were statistically significant. In both models, however, only the first three functions explained a statistically significant amount of shared variance between the variable sets ($p < .001$) and had canonical correlations above $.30$. Therefore, the three functions were deemed noteworthy in the context of this study (Blumentritt, 2012; Sherry & Henson, 2005). Demographic variables did not reach prominence in Functions 1 and 2 in either model, which were similar in terms of the

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

contributing variables. Age, on the other hand, became a contributor to Function 3 in both models. Considering the difference regarding the number of variables with structured coefficients of .40 or higher in Function 3 when comparing the models that included age and gender with the task dimensions and the interpersonal dimensions (2 versus 6, respectively), only the latter model was retained for interpretation in this study (Blumentritt, 2012). In the sensitivity analysis, level of competition did not contribute significantly to any of the three functions. Number of hours of training achieved prominence in the fourth function, which was not deemed noteworthy due to the low amount of shared variance between the variable sets it explained.

Following recommendations by Sherry and Henson (2005), Table 2 presents the standardized canonical function coefficients and structure coefficients (i.e. correlations between criterion/predictor variables and canonical variables) for Functions 1, 2, and 3 in the CCA model retained. The squared structure coefficients are also given as well as the communalities (h^2) across the three functions for each variable. Only variables with structured coefficients of .40 or higher were considered relevant for interpretation in this study (Blumentritt, 2012).

Function 1

In the CCA model, relevant criterion variables for Function 1, as supported by the squared structure coefficients, were primarily Learning and Effort, Support and Encouragement, and Observational Learning. In addition, Social Interaction, Positive Ability Information, Role Modelling, Comparison/Competition, and Pressure/Expectations made secondary contributions to the synthetic criterion variable. Furthermore, the structure coefficients' signs indicated that all these variables were positively related.

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

Regarding the predictor variable set in Function 1, the Authenticity, Stimulation and Value/Usefulness activity variables were primary contributors to the predictor synthetic variable in the model. These variables also tended to have the larger canonical function coefficients. All of these variables' structure coefficients had the same sign, indicating that they were all positively related. These variables were positively related to the interpersonal variables contributing to the function. Function 1 explained 51% of the shared variance between variables sets. Based on the characteristics of the variables making a contribution to Function 1, we labelled this function as 'supportive contextual dimensions' (for rationale, see Discussion section).

Function 2

Regarding Function 2, the coefficients in Table 2 suggest that the criterion variables of relevance were Negative Ability Information, Control and Demands, Negative Work Attitude, and, to a lesser extent, Performance and Winning and Pressure/Expectations. These interpersonal dimensions were positively related on this function. As for dimensions of a task nature, Repetition/Boredom was now the dominant predictor, with Ineffectiveness making also large contributions. These task-based variables were also positively related. Contributing task and interpersonal variables were positively related to each other. Function 2 explained 38% of the remaining variance in the variable sets after extraction of the prior function. Given the nature of the variables contributing to Function 2, we labelled this function as 'challenging contextual dimensions' (see Discussion section for rationale).

Function 3

Compared to the previous functions, Function 3 accounted for a lower amount of shared variance between the interpersonal and activity variable sets (18%), after extraction of the prior functions. In addition to the demographic factor of age, Performance and Winning,

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

Learning and Effort, and Comparison and Competition (all positively related), were the primary contributors of an interpersonal nature to the function. At the same time, Value/Usefulness and Ineffectiveness (inversely related) were the dominant predictors of a task nature. The main contributions of interpersonal and task related variables to the function remained modest (structure coefficients ranging from .40 to -.44). We labelled this function as “complex contextual dimensions” (see Discussion section for interpretation).

Discussion

Consistent with general study hypotheses, perceptions of task features of the sport environment, as measured by the ACYSQ, were related to perceptions of the interpersonal context of sport participation, assessed through the ICYSQ. As expected, interpersonal dimensions considered favorable regarding their psychosocial implications tended to be positively associated with desirable characteristics of practice activities and negatively associated with undesirable characteristics. Similarly, as anticipated, interpersonal dimensions deemed unfavorable as to their psychosocial implications tended to be positively associated with undesirable characteristics of practice activities and inversely related to desirable activity characteristics. Compared to the bivariate analysis, however, the multivariate CCA analysis revealed a more intricate and nuanced picture. Particularly, the multivariate analysis highlighted three functions that captured a substantial amount of the shared variance between interpersonal and task related variable sets. Additionally, the multivariate analysis underlined specific areas of intersection between perceptions of interpersonal and task dimensions of the sport environment that have implications for theory and practice.

Function 1 was comprised of a set of interrelated interpersonal and task contextual variables that, individually and collectively, made strong contributions to the function.

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

Notably, Learning and Effort, Support and Encouragement, and Observational Learning were the variables of an interpersonal nature that made primary contributions to this function.

Likewise, the task-based variables Authenticity, Stimulation, and Value/Usefulness made primary contributions to the function.

Underpinning Function 1, which we labelled “supportive contextual dimensions,” was a set of variables that either facilitate the learning and development process directly or support this process in several ways. A large body of literature in education and youth sport has documented the positive effects of environments that emphasize self-referenced improvement, aiming for personal bests, and applying effort as goals for participation. Notably, such mastery- or task-oriented environments have been found to foster self-determined forms of motivation and the quantity and quality of the participants’ engagement with the learning process (e.g., Meece et al., 2006). Likewise, availability of social support has been identified as an important component of environments that empower youth sport participants and enable them to reap the benefits of involvement in sport (e.g., Chan et al. 2018; Duda, 2013). A separate body of literature has also documented the critical role that observational learning plays either as fundamental mechanism through which learning occurs or as a motivational support in the learning process (e.g., McCullagh & Weiss, 2001). By showing the interrelation of these variables the results from this study contribute to integrate findings from the literature on learning/motivational climates, guided by achievement goal theory (Ames, 1992a; Nicholls, 1989), socially supportive environments, grounded in self-determination theory (Deci & Ryan, 2002), and observational learning, stemming from broader social learning theory (Bandura, 1986).

In addition, the structure of Function 1 underlines the essential, and often neglected, role of activities with certain characteristics in creating environments that are conducive to learning and development in achievement contexts such as youth sport. This is in keeping

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

with the seminal work of Ames (1992a,b), who proposed task structures (i.e., how tasks and learning activities are designed) as one example of classroom/practice structures that can make different types of achievement goals salient and affect participant engagement in learning. Specifically, ‘authentic’ activities that allow participants to practice skills in situations similar to those in which they will be used, ‘stimulating’ activities that bring interest and variety to practices, and activities that are perceived as ‘useful’ were strongly related to the interpersonal dimensions that made primary contributions to Function 1. Providing empirical support for some of the learning-enhancing aspects of these activity characteristics, Bengoechea, Sabiston, and Wilson (2017) found that the Stimulation dimension is associated with indices of enjoyment and perceived competence, and the Authenticity dimension is associated with indices of commitment in youth sport. Furthermore, work on intrinsic motivation suggests that activities perceived as valuable or useful for learning promote internalization and the integration of regulatory processes within one’s sense of self, resulting in self-determination and self-regulation (Deci et al., 1994).

Interpersonal variables that made primary contributions to Function 2 were Control and Demands, Negative Ability Information, and Negative Work Attitude, while Repetition and Boredom and Ineffectiveness were their task-based counterparts. At the core of Function 2, which we labelled ‘challenging contextual dimensions,’ were several interrelated interpersonal and task dimensions that, arguably, can hold back learning, and the motivation to learn, in sport and other achievement contexts. From an interpersonal point of view, the picture that emerged was reflective of a controlling and highly demanding environment, where participants receive information that signifies lack of competence and not everyone around takes the sport seriously and is dedicated. These features were matched, on the task contextual side, by practice activities perceived as overly repetitive, and boring, and as not

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

helping participants develop their skills and get better. Function 2 explained a substantial portion of the remaining variance between the interpersonal and task variable sets.

Interpersonal features of the sport environment, such as those captured under the dimensions Control and Demands, Negative Ability Information, and Negative Work Attitude may have detrimental implications for learning and the motivation to learn by affecting negatively the participants' perceived competence and autonomy, thwarting feelings of relatedness to others, and undermining intrinsic motivation and enjoyment (e.g., Bartholomew et al., , 2011; Bean et al., 2018; Bengoechea et al., 2015; Cronin & Allen, 2015; Duda, 2013; Weiss et al., 2009). On the task contextual side, research in educational settings suggests that a lack of variety in the activities offered and excessive repetition leads to participant boredom (Smith & St. Pierre, 2009; Rikard & Banville, 2006). In addition, there is evidence that higher ratings on the Ineffectiveness dimension of practice activities are associated with higher perceived competence in youth sport (Bengoechea, Sabiston, & Wilson, 2017). This means that practice leaders may have difficulties designing learning activities that provide an optimal challenge for highly skilled participants, resulting in a more negative assessment of the activities.

Function 3, labelled "complex contextual dimensions," is more difficult to interpret than the previous ones. Unlike Functions 1 and 2, demographic factors (age, specifically) reached prominence in Function 3. Overall, the structure of this function appears to indicate that, as age increases, perceptions that the environment promotes performance and winning as important goals for participation increase as well. Increased perceptions of a focus on performance and winning, in turn, were associated with practice activities perceived as providing less stimulation (i.e., interest, variety) but being also less ineffective. Consistent with the notion of complex environments (Csikszentmihalyi & Rathunde, 1998; see also Bengoechea, Wilson, and Dunn, 2017), the structure of this function suggests also that, as age

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

increased, perceptions of a focus on performance and winning tended to co-occur with perceptions of a focus on improvement and effort and with a tendency to engage in social comparison in sport. Furthermore, these perceptions and attitudes were associated with more favourable perceptions of practice activities in the form of higher ratings in value/usefulness and lower ratings in ineffectiveness.

Drawing upon the work of Csikszentmihalyi and Rathunde (1998), Bengoechea, Wilson, and Dunn (2017) used the term ‘complex environments’ to refer to an environmental pattern in youth sport characterized by complementary, but often seemingly opposing, attributes and processes of an interpersonal and task nature broadly indicative of challenge and support. In this study, such pattern was manifest in the prominent role that the interpersonal dimensions Performance and Winning, Social Comparison, and, counterintuitively, Learning and Effort--all three positively related--played in conforming this function. Likewise, the inverse association between the interpersonal dimension Performance and Winning and the Ineffectiveness activity dimension was suggestive of a pattern of environmental complexity. Youth sport environments characterized by a focus on performance and winning are often referred to in the literature as ‘ego-involving’ and have been linked with negative psychosocial and behavioural consequences (e.g., Duda & Balaguer, 2007; Newton et al., 2000; O’Rourke et al., 2013; Smith et al., 2008). Other studies in youth sport and physical education, however, have reported findings conflicting to some degree with the hypothesized link (e.g., Goudas & Biddle, 1994; Gould et al., 2012; Kipp & Weiss, 2015; Shaillée et al., 2017). At the same time, there is emergent evidence that complex environmental patterns are associated with indicators of adaptive youth development in the family context (Gute, Gute, Nakamura, & Csikszentmihalyi, 2008), physical education (Goudas & Biddle, 1994) and youth sport (Bengoechea, Wilson, and Dunn, 2017; Horn et al. 2012).

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

The structure of Functions 1 and 2 appears to support the hypothesis forwarded by Ames (1992a) that activity contextual and interpersonal contextual dimensions of learning environments are not complementary. According to this hypothesis, activity and interpersonal contextual dimensions of learning environments are not able to compensate for each other. The structure of Function 3, on the other hand, seems more consistent with the alternative hypothesis advanced by Ames (1992a) that inadequacies in one dimension (e.g., continued perceived emphasis on performance and winning in the environment) can be attenuated by strengths in another (e.g., practice activities perceived as more useful and less ineffective), at least in older adolescents. Nevertheless, given the amount of shared variance between interpersonal and activity variable sets captured by Function 3, caution is necessary when it comes to interpret the meaning of this function and its implications at this time.

Limitations and Strengths

The findings are based on a non-probabilistic sample, which warrants caution when extrapolating the findings to the population. The cross-sectional study design did not allow us to examine if, and how, changes in one variable set are associated with changes in the other set. Despite the comprehensiveness of the ICYSQ and ACYSQ instruments used in this study, the configuration and structure of the functions identified may have been affected by relevant variables not captured by these instruments. Furthermore, a majority of study participants competed in team sports, and whether this affected the configuration and structure of the functions identified is unclear. Although the current analysis was mainly concerned with the multivariate shared relationship between interpersonal and task-related variables, it is important to acknowledge that other sources of variation may affect this relationship. In this study, we included the important demographic factors of age and gender. However, other potentially relevant factors, such as biological maturity-related variation in young athletes' perceptions, were not considered in this research. Likewise, some factors in

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

the sport practice environment, beyond the interpersonal and task-related factors examined in this study (e.g., the sport team or club the participants were members of), may have introduced some degree of correlation in the responses that was unaccounted for in this study. In addition, ICYSQ items were not specifically designed to assess interpersonal factors in a sport practice setting. As a result, the strength of associations among interpersonal and practice-based activity dimensions of the sport environment may actually have been underestimated.

This study has also notable strengths. To the best of our knowledge, it is the first study that systematically addresses and explicates the intricate relationships between factors of an interpersonal and task nature in an achievement context relevant to youth development and socialization. It is also the first study to shed light on whether perceived interpersonal and activity dimensions of the youth sport environment are complementary or not. Furthermore, the study was based on comprehensive assessments of relevant interpersonal and practice-based activity factors and used a truly multivariate analytic approach to unravel the complexity of the relationships targeted.

Conclusions

Despite calls in the literature, little is known about how dimensions of an interpersonal and task nature relate specifically to each other in achievement contexts such as youth sport. To the best of our knowledge, this is the first study that explores systematically the intricate relationship between interpersonal and task dimensions of the youth sport environment. Consistent with Ames' (1992a) contentions about the nature of the relationship between social contextual and activity contextual classroom structures, the present findings suggest that adolescents' perceptions of interpersonal and task dimensions of the sport environment are interdependent and have implications for how youth sport environments are

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

conceptualized and analysed. The functions identified in this study expose areas where adolescents' perceptions of interpersonal and practice-based activity factors of the sport environment intersect and provide an illustration of the integration of these factors in a real life setting.

Conflict of Interest: The authors declare that they have no conflict of interest.

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

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INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

Table 1

Intercorrelation Matrix with Descriptive Statistics and Reliability Estimates for Study Variables

Variables	<i>M</i>	<i>SD</i>	α	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. CD ^a	3.80	1.37	0.80	-															
2. NAI ^a	3.07	1.48	0.82	0.61**	-														
3. NWA ^a	4.31	1.47	0.71	0.50**	0.50**	-													
4. PW ^a	4.75	1.31	0.73	0.55**	0.53**	0.59**	-												
5. P/E ^a	5.22	1.24	0.79	0.45**	0.37**	0.45**	0.61**	-											
6. CC ^a	5.40	1.16	0.73	0.24**	0.18**	0.31**	0.40**	0.53**	-										
7. RM ^a	5.71	1.21	0.78	0.25**	0.22**	0.24**	0.36**	0.57**	0.44**	-									
8. OL ^a	5.84	1.07	0.79	0.10	0.09	0.09	0.26**	0.44**	0.48**	0.68**	-								
9. SI ^a	6.42	0.77	0.74	-0.04	-0.08	0.08	0.04	0.29**	0.26**	0.37**	0.39**	-							
10. LE ^a	5.65	0.97	0.80	0.20**	0.06	0.21**	0.31**	0.46**	0.46**	0.52**	0.58**	0.46**	-						
11. PAI ^a	5.34	1.27	0.90	0.15**	-0.03	0.17**	0.14*	0.28**	0.34**	0.27**	0.30**	0.32**	0.50**	-					
12. SE ^a	5.66	1.02	0.77	0.08	-0.02	0.08	0.06	0.24**	0.23**	0.37**	0.38**	0.45**	0.62**	0.58**	-				

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

13. St ^b	5.32	1.13	0.86	0.02	-0.05	-0.03	-0.02	0.13*	0.20**	0.31**	0.40**	0.40**	0.46**	0.37**	0.51**	-			
14. V/U ^b	5.62	1.16	0.89	-0.01	-0.07	0.04	0.08	0.18*	0.26**	0.30**	0.44**	0.33**	0.55**	0.30**	0.40**	0.69**	-		
15. Au ^b	5.36	1.27	0.85	0.06	0.00	0.10	0.08	0.25**	0.26**	0.31**	0.45**	0.39**	0.57**	0.36**	0.46**	0.63**	0.73**	-	
16. R/B ^b	3.91	1.28	0.73	0.47**	0.47**	0.40**	0.31**	0.27**	0.20**	0.11	-0.06	-0.03	0.00	0.02	-0.11	-0.23**	-0.29**	-0.15**	-
17. Iff ^b	2.75	1.24	0.72	0.35**	0.38**	0.21**	0.13*	0.08	-0.01	-0.04	-0.19**	-0.13*	-0.14*	-0.01	-0.11	-0.22**	-0.39**	-0.23**	0.50**

Note. Superscripted letter next to the variable acronym indicates what questionnaire the variable belongs to (^aICYSQ, ^bACYSQ). *M* = mean; *SD* = standard deviation; α = Chronbach's alpha; CD = Control-Demands; NAI = Negative Ability Information; NWA = Negative Work Attitude; PW = Performance and Winning; P/E = Pressure/Expectations; CC = Comparison and Competition; RM = Role Modeling; OL = Observational Learning; SI; Social Interaction; LE = Learning and Effort; PAI = Positive Ability Information; SE = Support and Encouragement; St = Stimulation; V/U = Value/Usefulness; Au = Authenticity; R/B = Repetition/Boredom; Iff = Ineffectiveness. Correlations are shown on the lower diagonal of the matrix for the total sample. Sample size is consistent across each element on the lower diagonal matrix ($n = 310$). * $p < .05$, ** $p < .01$ (two-tailed significance).

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

Table 2

Canonical Solution

Variable	Function 1			Function 2			Function 3			h^2 %
	Coef	r_s	r_s^2 %	Coef	r_s	r_s^2 %	Coef	r_s	r_s^2 %	
CD ^a	.12	.28	7.84	.42	<u>.77</u>	59.29	.19	-.02	0.04	67.17
NAI ^a	.09	.19	3.61	.49	<u>.80</u>	64.00	.14	-.02	0.04	67.65
NWA ^a	.12	.25	6.25	.22	<u>.63</u>	39.69	-.28	-.35	12.25	58.19
PW ^a	-.14	.19	3.61	-.19	<u>.46</u>	21.16	-.10	<u>-.44</u>	19.36	44.13
P/E ^a	-.05	<u>.42</u>	17.64	.11	.37	13.69	-.05	-.33	10.89	42.22
CC ^a	.02	<u>.45</u>	20.25	.21	.22	4.84	-.15	<u>-.40</u>	16.00	41.09
RM ^a	-.05	<u>.54</u>	29.16	.08	.08	0.64	.14	-.17	2.89	32.69
OL ^a	.30	<u>.65</u>	42.25	-.35	-.22	4.84	-.08	-.29	8.41	55.50
SI ^a	.25	<u>.60</u>	36.00	.04	-.16	2.56	.21	.01	0.01	38.57
LE ^a	.42	<u>.83</u>	68.89	-.09	-.12	1.44	-.84	<u>-.43</u>	18.49	88.82
PAI ^a	.06	<u>.58</u>	33.64	.08	-.03	0.09	.19	.11	1.21	34.94
SE ^a	.18	<u>.72</u>	51.84	-.28	-.25	6.25	.47	.20	4.00	62.09
Age	-.28	-.34	11.56	-.10	-.07	0.49	-.48	<u>-.60</u>	36.00	48.05
Gender	.22	.19	3.61	-.05	.12	1.44	.18	.11	1.21	6.26
R_c^2			50.72			37.92			17.62	
St ^b	.46	<u>.82</u>	67.24	-.11	-.32	10.24	1.02	.28	7.84	85.32
V/U ^b	.12	<u>.73</u>	53.29	.10	-.37	13.69	-1.10	<u>-.43</u>	18.49	85.47
Au ^b	.58	<u>.89</u>	79.21	-.04	-.24	5.76	.01	-.17	2.89	87.86
R/B ^b	.24	.08	0.64	.74	<u>.94</u>	88.36	-.44	-.13	1.69	90.69
If ^b	.13	-.03	0.09	.39	<u>.76</u>	57.76	.45	<u>.42</u>	17.64	75.49

INTERPERSONAL PROCESSES AND PRACTICE ACTIVITIES

Note. Superscripted letter next to the variable acronym indicates what questionnaire the variable belongs to (^aICYSQ, ^bACYSQ). Structure coefficients (r_s) equal or greater than $|.40|$ are underlined. Coef = standardized canonical function coefficient; r_s = structure coefficient; r_s^2 = squared structure coefficient; h_2 = communality coefficient; R_c^2 = squared canonical correlation. CD = Control and Demands; NAI = Negative Ability Information; NWA = Negative Work Attitude; PW = Performance and Winning; P/E = Pressure/Expectations; CC = Comparison and Competition; RM = Role Modeling; OL = Observational Learning; SI = Social Interaction; LE = Learning and Effort; PAI = Positive Ability Information; SE = Support and Encouragement; St = Stimulation; V/U = Value/Usefulness; R/B = Repetition/Boredom; If = Ineffectiveness.