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ORIGINAL ARTICLE

Influence of sport type and interdependence on the developmental experiences of youth male athletes

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Abstract

The purpose of this study was to examine the relationships between sport type, interdependence (task and outcome), and the developmental experiences of select male basketball players ($n = 129$) and middle-distance runners ($n = 83$) aged 14–17 years. Athletes completed the Youth Experiences Survey 2.0 (Hansen & Larson, 2005) and a modified measure assessing task and outcome interdependence (Van der Vegt, Emans, & Van de Vliert, 1998, 2001). Hierarchical multiple regression determined that basketball players reported higher rates of teamwork and social skills, adult networks and social capital, and negative experiences. Furthermore, outcome interdependence was a predictor of identity exploration, initiative, emotional regulation, positive relationships, teamwork and social skills, and adult networks and social capital experiences independent of sport type. Although different sports may provide different learning environments, the developmental experiences youth garner may be more strongly influenced by how the people involved interact (outcome interdependence) than by the type of sport.

Keywords: *Youth sport, positive youth development, group dynamics*

Introduction

Many studies and reviews have demonstrated the positive and negative outcomes associated with participation in youth sport (Fraser-Thomas, Côté, & Deakin, 2005; Siegenthaler & Gonzalez, 1997; Wankel & Berger, 1990; Weiss & Raedeke, 2004). Few studies, however, have been solely dedicated to examining the kinds of developmental experiences in youth sport that may be promoting positive youth development. Dworkin and colleagues (Dworkin, Larson, & Hansen, 2003) were among the first to examine the developmental experiences of youth in different activities. They defined developmental experiences as “experiences that teach you something or expand you in some way, that give you new skills, new attitudes, or new ways of interacting with others” (p. 20). The authors used focus groups with youth between 14 and 18 years of age to help identify key domains that represented particularly salient developmental experiences for youth in different activity

settings, and developed the Youth Experiences Survey (Hansen & Larson, 2002; 2005).

Hansen and colleagues (Hansen, Larson, & Dworkin, 2003) used the Youth Experiences Survey to ask 450 youth from grades 9, 11, and 12 about their developmental experiences in several types of extracurricular and community-based organized activities, including performance and fine arts (e.g. music, dance clubs), academic clubs and organizations (e.g. science club), community-oriented activities (e.g. Boy Scouts, 4-H), service activities (e.g. environmental club), faith-based youth groups (e.g. church youth group), and sport. Hansen and colleagues found that sport activities were positively associated with higher rates of self-knowledge, emotional regulation, and physical skills experiences, compared with other youth activities. However, youth in sports programmes also reported having more negative experiences involving negative peer interaction and inappropriate adult behaviour than service and faith-based activities, academic and leadership activities, and performance and fine arts activities. Interestingly, although

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many of the youth were on sport teams, these youth did not report higher teamwork and social skills scores, or higher scores for the learning of prosocial norms.

A second study by Larson and colleagues (Larson, Hansen, & Moneta, 2006) examined and compared youth's developmental experiences in different activities. A total of 2280 grade 11 youth completed a computer-administered version of the Youth Experiences Survey. Compared with other types of extra-curricular and community-based organized activities (e.g. faith-based service, academic and leadership, performance and fine arts, community and vocational clubs), youth in sport reported significantly more experiences related to initiative, emotional regulation, and teamwork experiences. Youth in sport also reported significantly fewer experiences relating to identity work, positive relationships, and adult network experiences. Furthermore, compared with school, sports were particularly suited for experiences fostering initiative.

Although these studies shed light on developmental experiences in different types of organized activities, they did not focus on differences within various types of sport programmes (e.g. team vs. individual sports, recreational vs. competitive sports). All youth sports were grouped together. To better understand the processes by which sports might affect youth development differently, it is important to know the kinds of developmental experiences that different sports might provide. Consequently, several studies have compared experiences and outcomes between sport types. Compared with team sports, athletes from individual sports have been found to drink more alcohol (Martens, Watson, & Beck, 2006), have different coping strategies for stress (Yoo, 2001), higher moral character and lower social character (Rudd & Stoll, 2004), better moral reasoning (Bredemeier & Shields, 1986), higher concern for others (Vallerand, Deshaies, & Cuerrier, 1997), and are less influenced by coaches' behaviour that includes positive and negative personal rapport, mental preparation, goal setting, competitions strategies, and technical skills (Baker, Yardley, & Côté, 2003).

A limitation arising from the sport type body of research has been the discussion of the reported differences in experiences and outcomes between the sport types. Researchers have often attributed the experiential and outcome differences between sport types to the interdependence of the setting, where interdependence is defined as the structure of the interactions among the participants in the setting (Rusbult & Van Lange, 2003). From a substantive standpoint, this suggestion is appealing, as it has been proposed that different types of sports (i.e. individual sports vs. team sports) involve differing degrees of dependence or reliance on another person to successfully execute one's task (Carron, 1988;

Carron & Chelladurai, 1979; Chelladurai & Saleh, 1978). While interdependence may be an important moderating factor contributing to these study findings, researchers examining sport type have not directly assessed the interdependence of the sport settings. This limitation is surprising given the extensive body of literature evaluating interdependence in other settings such as business and education.

Interdependence is said to occur when the actions of one individual within a group have implications for the next member, and ultimately the group as a whole (Johnson, 2003; Johnson & Johnson, 1998; Schultz & Schultz, 2000). Based upon this definition, interdependence can be positive, negative or absent. Positive interdependence is often characterized by individuals engaging in promotive interactions, such as offering another group member assistance or sharing information (Johnson, 2003). In contrast, negative interdependence is characterized by individuals obstructing or discouraging the efforts of others while focusing on being productive. Finally, conditions of no interdependence occur when individuals work independently without any interchange with each other (Johnson, 2003). Research in business and education has identified a number of benefits of positive interdependence, including increased individual accountability and responsibility, promoting interaction, social skills, and reflection on group functioning. In sport, limited research has evaluated the construct of interdependence apart from a line of research by Jowett and colleagues examining the interaction of coaches and athletes and its consequences on athletes' feelings, thoughts, and behaviours (Jowett, 2005; Jowett & Meek, 2000; Jowett & Ntoumanis, 2004; Jowett, Paull, & Pensgaard, 2005). However, athletes' interdependence in different sport contexts and potential developmental experiences associated with interdependence in a youth sport setting have yet to be explored.

A second limitation of sport type research has been the view of interdependence as a unidimensional, static construct. Similar to other group constructs (e.g. cohesion), interdependence has been conceptualized as being multidimensional and dynamic in nature. Organizational psychologists have proposed that interdependence includes two key dimensions: task interdependence and outcome interdependence. Van der Vegt and colleagues (Van der Vegt, Emans, & Van de Vliert, 1998) operationalize task interdependence as the "interconnections between tasks whereby the performance of one individual depends on the performance of another individual" (p. 127). For example, in the sport of basketball, accurate passing among team members is integral to advancing the ball against an opposing

team to create a scoring opportunity. The task dimension of interdependence has been the focus of the sport type and sport psychology literature.

It has been suggested that interdependence should not only be viewed in terms of the immediate interactions and behaviours but also as a consequence or future outcome of the interaction (Kelley, 1984; Kelley et al., 2002; Rusbult & Van Lange, 2003). As such, the second dimension is outcome interdependence. According to Thibaut and Kelley's theory of interdependence, the nature of interactions in a setting shape positive outcomes, referred to as "rewards", or negative outcomes, referred to as "costs" (Kelley & Thibaut, 1978; Thibaut & Kelley, 1959). In the organizational psychology literature, outcome interdependence has been operationalized as the extent to which "people believe that their personal benefits and costs depend on successful goal attainment by other team members" (Van der Vegt et al., 1998, p. 130). In a sport setting, the attainment of success for individual and team sport athletes may be a function of the interdependence of athletes within training and competition environments. While the two distinct dimensions of interdependence have been highlighted in the organizational psychology literature, studies have not yet explicitly examined the relationship between task and outcome interdependence and developmental experiences provided by different sports.

Therefore, the general purpose of this study was to examine the relationships between sport type, two dimensions of interdependence (task and outcome), and the developmental experiences of young athletes. More specifically, the study aimed to: (1) compare sport type and task and outcome interdependence, (2) compare the developmental experiences of the individual sport of distance running and the team sport of basketball, and (3) examine how task and outcome interdependence may be associated with the developmental experiences of young athletes in different sport settings.

Methods

Participants

Participants included 212 male athletes between the ages of 14 and 17, who had an average age of 15.27 years ($s = 1.04$). Athletes came from two sports – basketball and middle-distance running. Basketball players ($n = 129$) had a mean age of 14.97 years ($s = .95$), whereas middle-distance runners ($n = 83$) had a mean age of 15.75 years ($s = .99$). Basketball players and middle-distance runners were chosen to represent a team and an individual sport based upon Chelladurai and Saleh's (1978) dependency

classification system, which proposes that highly interdependent sports are team sports (e.g. basketball, volleyball, soccer, hockey), while athletes in sports that are primarily independent in nature are classified as individual sport athletes (e.g. swimming, gymnastics, golf, track and field).

Basketball players were select high school-aged youth playing on a competitive club team for a geographic region. These teams thus represented a select level of competition for the athletes' age group. Basketball players had coaches who were required by a provincial governing body to possess at least a full Level 2 National Coaching Certification Program (NCCP; Coaching Association of Canada, 2006; Theory, Technical, Practical) to be allowed to coach.

To match the level of competition and quality of coaching among the basketball players, middle-distance runners were also members of a competitive club track team. Middle-distance running was selected as an individual sport, because other events in track and field such as 100 m sprints involve relay races that require collaboration and a higher level of interdependence to successfully complete the task. Furthermore, a runner had to be running no less a distance than 800 m in their competitions to be considered a middle-distance runner and to be included in this study. Similar to the basketball players, runners had coaches that were NCCP certified.

Procedure

Participants were initially contacted through coaches, either by telephone or by electronic mail. During this initial contact, a letter of information was either read or sent to the coach who explained necessary information about the study. If coaches were interested in having their athletes participate, a letter of information for parents, a letter of information for athletes, and a consent form were sent to all prospective participants. Because participants were under the age of 18, consent forms were signed by participants' parents. A time was arranged with coaches to meet, have the participants return the signed parental consent forms, and complete the pen-and-paper style questionnaires. This meeting usually took place before a practice, in a quiet area, either in a gym or other available room. Participants completed the questionnaires in approximately 25 min.

Instruments and scoring

Demographic information. Age, the number of years involved in their current sport, and the amount of weekly time spent in formal practice were recorded for each participant. Age was determined by asking

athletes their date of birth. The number of years involved in their current sport was assessed by asking athletes to respond to the statement, "Age at which you first started organized running or basketball", and then subtracting this age from their current age. This variable provided a proxy measure of years of involvement in sport. To measure the amount of weekly time spent in formal practice, athletes were asked to indicate the number of hours they trained in response to the question, "Each week, how many hours do you spend in formal practice with a coach?" Age, the number of years involved in their current sport, and the amount of weekly time spent in formal practice were included as covariates to control for additional contextual and individual characteristics.

Developmental experiences. Adolescents were asked to complete the Youth Experiences Survey 2.0 (Hansen & Larson, 2005). The Youth Experiences Survey is a 70-item self-report survey that explores youth's personal, interpersonal, and negative experiences in specific organized activities. Respondents were asked to base their responses specifically on their involvement in the sport in which they were currently involved. The Youth Experiences Survey 2.0 includes 70 items divided into seven developmental domains: (1) identity work, (2) initiative, (3) emotional regulation (basic skills), (4) positive relationships, (5) teamwork and social skills, (6) adult networks and social capital, and (7) negative experiences (Hansen & Larson, 2005). Respondents rated each item on a 4-point Likert scale, ranging from 1 ("yes, definitely") to 4 ("not at all"). An example of an item for the domain of teamwork and social skills is "Learned how my emotions and attitude affect others in the group". Items were reverse coded. A high score indicated more developmental experiences.

All Youth Experiences Survey 2.0 subscales demonstrated acceptable internal consistency. Cronbach alpha values ranged from 0.71 (identity work) to 0.86 (teamwork and social skills) for the six positive scales. Most athletes reported a low level of negative experiences (mean = 1.46, $s = 0.44$), and as a result this variable was skewed to the right. For this reason, the natural logarithm of the negative experiences data was used, which provided a more normal distribution. The negative experiences subscale also demonstrated acceptable internal consistency with a Cronbach alpha value of 0.87. The Youth Experiences Survey 2.0 has been found to be a valid and reliable measure for adolescents in a number of organized activity settings including sport (Hansen & Larsen, 2005, 2007; Larsen et al., 2006; Strachan, Côté, & Deakin, 2009).

Sport type. It was conceptually important to select sport types that represented potentially varying levels of interdependence and that also represented distinct settings (cf. Chelladurai & Saleh, 1978). Therefore, athletes participating in basketball were chosen to represent a team sport and middle-distance runners were selected to represent an individual sport.

Interdependence. Interdependence was assessed using the mean item score derived from 10 final items assessing task and outcome interdependence. This scale was initially composed of five items from an existing organizational psychology task interdependence scale (Van der Vegt, Emans, & Van de Vliert, 2000, 2001) and six items from an existing outcome interdependence subscale (Van der Vegt et al., 1998), modified to reflect athletes' experiences in sport. Participants responded on a 5-point scale with anchors of 1 ("strongly agree") to 5 ("strongly disagree") for task interdependence items and a 5-point scale, ranging from 1 ("completely hinder") to 5 ("completely benefit") for outcome interdependence items. The items for both the task interdependence subscale and the outcome interdependence subscale were modified to form a new sport-specific interdependence measure. An exploratory factor analysis was completed on the 11 items designed to measure both task interdependence and outcome interdependence. An oblique promax rotation was chosen to allow factors to be correlated given the exploratory nature of this analysis. Item 3 was dropped due to a lack of simple structure with the factor loading and a spurious solution as dictated by a high communality estimate exceeding 1.0. Upon further review, this item also appeared to lack the conceptual clarity of the remaining items. The analysis was completed once more and yielded a two-factor solution that included 10 of the original 11 items (see Table I). Judging from the eigenvalues and the screeplot, two factors (task and outcome interdependence) appeared to represent the best structure.

The outcome interdependence factor (Factor 1) was composed of six items. The six items had a Cronbach alpha value of 0.69 and accounted for 20.2% of the variance. The second factor, labelled task interdependence, was composed of four items. The task interdependence factor had a Cronbach alpha value of 0.63, and accounted for 9.7% of the variance.

A mean item score was used to measure task interdependence (mean = 3.39, $s = 0.79$) and outcome interdependence (mean = 3.98, $s = 0.58$). Following reverse coding, a high average score on the two scales reflected a high degree of task and outcome interdependence respectively. In terms

Table I. Task and outcome interdependence scale items

Item	Wording
1	I have to obtain information and advice from teammates or other athletes I practise with, to perform well ¹
2	I depend on my teammates or other athletes I practise with to perform well ¹
3	In order to perform well, I have to work closely with my teammates or other athletes I practise with ¹
4	My teammates and other athletes I practise with have to obtain information and advice from me in order to perform well ¹
5	It (benefits/hinders) me when my teammates or athletes with whom I practise attain their goals ²
6	In my sport, the things my teammates or athletes with whom I practise want to accomplish and the things I want to accomplish are (compatible/incompatible) ²
7	It is (advantageous/disadvantageous) for me when my teammates or athletes with whom I practise succeed in their sport ²
8	When my teammates or athletes with whom I practise succeed in their sport, it is at my (expense/benefit) ²
9	In my sport, how strongly my teammates or athletes with whom I practise care about achievement (helps/hinders) my own achievement ²
10	When my teammates or athletes with whom I practise succeed in their sport, it works out (positively/negatively) for me ²

Note: 1 = task interdependence item, 2 = outcome interdependence item.

of construct validity, outcome interdependence had significant small to moderate positive correlations ($r=0.22-0.41$) with all positive developmental experiences (see Table II). With the exception of emotional regulation ($r=0.04$), task interdependence had significant small correlations with the five positive developmental experiences ($r=0.15-0.24$). Most importantly, both task ($r=0.17$) and outcome ($r=0.30$) interdependence had a significant positive correlation with teamwork ($P<0.01$).

Data analysis

Sport type and interdependence. To compare sport type (individual, team) and two dimensions of interdependence (task, outcome), two independent sample *t*-tests were conducted.

Sport type, interdependence, and developmental experiences. To investigate the relationships between sport type, interdependence, and developmental experiences, a series of hierarchical multiple regressions were conducted. In hierarchical regression, the researcher is able to control the order of entry of the independent variable or set of independent variables in each step of the regression to determine the importance and unique contribution of each independent variable or set of independent variables on the prediction of the dependent variable (Tabachnick & Fidell, 2007). The order of entry of the independent variables assigned by the researcher is often based upon theoretical or logical considerations (Tabachnick & Fidell, 2007). In this study, seven separate hierarchical multiple regression models, corresponding to the seven domains of the Youth Experiences Survey 2.0 as dependent variables, were conducted. Age, the number of years the athletes had been involved in the current sport, and the number of hours the athletes spent in formal practice each week were entered as covariates in the first step of a three-step model.

Second, sport type was entered into the model. Third, the two dimensions of interdependence, task, and outcome were entered into the model. This procedure helped to determine the independent relationships of sport type and interdependence with the developmental experiences of young athletes by examining the standardized beta coefficients and variances accounted for by each predictor variable.

Because of the manner in which the sport type literature often attributes sport type differences to interdependence (Baker et al., 2003; Bredemeier & Shields, 1986; Martens et al., 2006; Rudd & Stoll, 2004; Vallerand et al., 1997; Yoo, 2001), sport type was entered first into the regression model, before interdependence, to determine whether interdependence captured any significant amount of variance in the developmental domains, over and above sport type.

Regression model *F*-tests were conducted using a Bonferroni adjusted nominal alpha value of 0.007 per test, based on an actual alpha value of 0.05 divided by 7 *F*-tests as recommended by Mundfrom and colleagues (Mundfrom, Perret, Schaffer, Piccone, & Roozeboom, 2006).

Results

Sport type and interdependence

First, it was determined whether basketball players reported a different level of interdependence from middle-distance runners. Basketball players (mean = 3.50, $s=0.83$) reported experiencing more task interdependence than middle-distance runners (mean = 3.21, $s=0.69$) ($t_{210}=2.56$, $P<0.01$). However, no significant differences were found in terms of outcome interdependence between basketball players (mean = 3.98, $s=0.61$) and middle-distance runners (mean = 3.98, $s=0.53$) ($t_{210}=-0.081$, $P>0.05$).

Table II. Correlations among variables ($n = 212$)

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Sport type	1												
2. Age	0.386**	1											
3. Years involved in organized activity	-0.050	0.187**	1										
4. Number of hours of practice under coach supervision	-0.047	-0.002	0.095	1									
5. Task interdependence	-0.189*	-0.099	-0.084	0.062	1								
6. Outcome interdependence	0.027	0.108	0.163*	0.123	0.221*	1							
7. Identity work	-0.099	0.009	0.086	0.225**	0.235**	0.380**	1						
8. Initiative	-0.045	0.090	0.164*	0.252**	0.187**	0.411**	0.573**	1					
9. Emotional regulation	-0.173*	-0.060	0.072	0.090	0.043	0.240**	0.450**	0.494**	1				
10. Positive relationships	-0.167*	-0.089	0.091	0.188**	0.163*	0.219**	0.523**	0.511**	0.478**	1			
11. Teamwork and social skills	-0.268**	-0.039	0.210**	0.091	0.167*	0.295**	0.468**	0.544**	0.560**	0.574**	1		
12. Adult networks and social capital	-0.239**	-0.094	0.128	0.185**	0.146*	0.273**	0.592**	0.511**	0.538**	0.604**	0.611**	1	
13. Negative experiences	-0.232**	-0.101	-0.087	0.081	0.143*	-0.132	0.086	-0.083	0.104	0.181**	0.073	0.187**	1

* $P < 0.05$, ** $P < 0.01$.

Sport type, interdependence, and developmental experiences

Correlations. The correlations between task interdependence, outcome interdependence, and sport type were examined, controlling for the covariates of age, weekly time in formal practice, and the number of years involved in current sport. Task and outcome interdependence were significantly correlated ($r_{212} = 0.221$, $P < 0.01$). Sport type was significantly correlated with task interdependence ($r_{212} = -0.189$, $P < 0.01$). However, sport type was not significantly correlated with outcome interdependence ($r_{212} = 0.027$, $P > 0.05$), which suggested that outcome interdependence was independent of sport type.

Hierarchical multiple regression models. The final model (step 3) of the hierarchical regressions including covariates, sport type, and interdependence (task, outcome) as predictor variables, significantly predicted all the domains: identity work ($F_{6,205} = 8.91$, $P < 0.001$), initiative experiences ($F_{6,205} = 9.940$, $P < 0.001$), emotional regulation ($F_{6,205} = 3.70$, $P = 0.002$), positive relationships ($F_{6,205} = 4.24$, $P < 0.001$), teamwork and social skills ($F_{6,205} = 8.27$, $P < 0.001$), adult networks and social capital ($F_{6,205} = 6.55$, $P < 0.001$), and negative experiences ($F_{6,205} = 3.43$, $P = 0.003$). Table III presents the full hierarchical multiple regression statistics for the three-step regression models performed for each developmental experience domain. Sport type

Table III. Summary of hierarchical multiple regression statistics for sport type and interdependence predicting growth experiences

Dependent variable	Variables entered	Model F	Adjusted R^2	ΔR^2	Standardized β (step 3)
Identity work	1. Covariates ^a	2.95*	0.027	0.041*	
	2. Sport type	2.82*	0.033	0.011	-0.079
	3. Interdependence	8.91**	0.184	0.155**	
	- Task				0.146*
	- Outcome				0.339**
Initiative experiences	1. Covariates ^a	5.54**	0.061	0.074**	
	2. Sport type	4.38**	0.060	0.004	-0.041
	3. Interdependence	9.94**	0.203	0.147**	
	- Task				0.106
	- Outcome				0.351**
Emotional regulation	1. Covariates ^a	.74	-0.004	0.011	
	2. Sport type	1.82	0.015	0.023*	-0.170
	3. Interdependence	3.70**	0.071	0.064**	
	- Task				-0.054
	- Outcome				0.265**
Positive relationships	1. Covariates ^a	2.85*	0.026	0.039	
	2. Sport type	3.13**	0.039	0.018	-0.123
	3. Interdependence	4.24**	0.084	0.053**	
	- Task				0.087
	- Outcome				0.198**
Teamwork and social skills	1. Covariates ^a	3.81*	0.038	0.052*	
	2. Sport type	6.28**	0.091	0.056**	-0.239*
	3. Interdependence	8.27**	0.171	0.087**	
	- Task				0.070
	- Outcome				0.275**
Adult networks and social capital	1. Covariates ^a	2.82*	0.025	0.039*	
	2. Sport type	4.53**	0.063	0.041**	-0.207*
	3. Interdependence	6.55**	0.136	0.080**	
	- Task				0.042
	- Outcome				0.275**
Negative experiences	1. Covariates ^a	1.42	0.006	0.020	
	2. Sport type	3.68	0.048	0.046*	-0.217**
	3. Interdependence	3.43	0.065	0.025	
	- Task				0.110
	- Outcome				-0.148*

Note: Sport type coded as: 1 = basketball, 2 = middle-distance running.

^a Predictors: age, hours each week in formal practice, years involved in current sport.

* $P < 0.05$, ** $P < 0.01$.

was coded so that basketball had a value of 1 and middle-distance running had a value of 2.

Sport type. When sport type was added to each developmental experience domain's hierarchical regression model in the second step, sport type accounted for a significant additional 5.6% of the variance in teamwork and social skills ($F_{(\text{change})1,207} = 13.05, P < 0.001$), a significant additional 4.1% of the variance in adult networks and social capital ($F_{(\text{change})1,207} = 9.32, P = 0.003$), and a significant additional 4.6% of the variance in negative experiences ($F_{(\text{change})1,207} = 10.28, P = 0.002$). Based on significant standardized beta coefficients, sport type was an independent predictor of teamwork and social skills ($\beta = -0.239, P < 0.01$), adult networks and social capital ($\beta = -0.201, P < 0.01$), and negative experiences ($\beta = -0.217, P < 0.01$).

Basketball players (mean = 3.27, $s = 0.53$) reported a significantly greater rate of developmental experiences promoting teamwork and social skills than middle-distance runners (mean = 2.97, $s = 0.63$) ($t_{210} = 3.738, P < 0.01$). Furthermore, basketball players (mean = 2.83, $s = 0.69$) experienced significantly more developmental experiences promoting adult networks and social capital than middle-distance runners (mean = 2.49, $s = 0.69$) ($t_{210} = 3.45, P < 0.01$). In addition, basketball players (mean = 1.56, $s = 0.51$) reported significantly more negative experiences than middle-distance runners (mean = 1.35, $s = 0.30$) ($t_{210} = 3.435, P < 0.01$). As described in Table III, sport type was not an independent predictor of identity work, initiative experiences, emotional regulation or positive relationships (all P s > 0.05).

Interdependence. When task and outcome interdependence were added in step 3 for each developmental experience domain's hierarchical regression model, interdependence accounted for a significant additional 15.5% of the variance in identity work ($F_{(\text{change})2,205} = 20.06, P < 0.01$), 14.7% in initiative experiences ($F_{(\text{change})2,205} = 19.50, P < 0.01$), 6.4% in emotional regulation ($F_{(\text{change})2,205} = 7.24, P < 0.01$), 5.3% in positive relationships ($F_{(\text{change})2,205} = 6.15, P = 0.003$), 8.7% in teamwork and social skills ($F_{(\text{change})2,205} = 11.03, P < 0.01$), and 8.0% in adult networks and social capital ($F_{(\text{change})2,205} = 9.81, P < 0.01$).

An examination of the standardized beta coefficients revealed both task ($\beta = 0.146, P < 0.05$) and outcome ($\beta = 0.339, P < 0.01$) interdependence to be independent predictors of identity work, and outcome interdependence to be an independent predictor of initiative experiences ($\beta = 0.351, P < 0.01$), emotional regulation ($\beta = 0.265, P < 0.01$), positive relationships ($\beta = 0.198, P < 0.01$), teamwork and

social skills ($\beta = 0.275, P < 0.01$), and adult networks and social capital ($\beta = 0.275, P < 0.01$).

Discussion

Sport type and interdependence

In the present study, differences were found between team sport basketball players and the individual sport middle-distance runners in terms of task interdependence. These findings support longstanding classifications of sport activities based upon the interdependence of the task (Carron, 1988; Carron & Chelladurai, 1979; Chelladurai & Saleh, 1978). However, no differences were found between the team sport basketball players and the individual sport middle-distance runners on outcome interdependence. This finding is notable because it challenges the common assumption that team sports and individual sports represent different levels of interdependence in relation to outcomes, and highlights the value of considering how people interact both across and within sport types to achieve (desired or performance) outcomes.

Sport type and developmental experiences

Results from the study also revealed that sport type independently predicted teamwork and social skills, adult networks and social capital, and negative experiences. Compared with middle-distance runners, basketball players reported greater rates of developmental experiences that promoted teamwork and social skills, and adult networks. However, more negative experiences were also reported by basketball players than by middle-distance runners. That differences were observed between the team sport (basketball) and the individual sport (middle-distance running) is consistent with previous research comparing team and individual sports that also found important differences on a variety of experience and outcome measures (Baker et al., 2003; Bredemeier & Shields, 1986; Martens et al., 2006; Rudd & Stoll, 2004; Vallerand et al., 1997; Yoo, 2001). Support for the higher interpersonal domain of teamwork and social skills in the basketball players in relation to the middle-distance runners can be drawn from the work of Rudd and Stoll (2004), who reported that team sport athletes had greater social character than individual sport athletes and non-athletes. While the existing sport type literature cannot account for the reported differences in adult networks and negative experiences between the team and individual athletes, collectively the study findings and previous sport type research highlight the importance of treating each sport as a distinct learning environment providing different kinds of

developmental experiences. In addition, the findings emphasize the need for future studies to explore the complex dynamics involved in negative developmental experiences.

Sport type, interdependence, and developmental experiences

While controlling for sport type, task and outcome interdependence were associated with six positive developmental experience domains: (a) identity work, (b) initiative, (c) emotional regulation, (d) positive relationships, (d) teamwork and social skills, and (e) adult networks and social capital. For these developmental experience domains, a higher level of outcome interdependence was associated with a higher rate of each developmental experience. Overall, outcome rather than task interdependence appeared to have a stronger relationship with the kinds of developmental experiences in the sport setting than did sport type. Outcome interdependence independently predicted the two positive developmental experiences predicted by sport type (i.e. teamwork and social skills, adult networks and social capital) in addition to independently predicting four other developmental experience domains (i.e. identity work, initiative, emotional regulation, positive relationships). These findings are consistent with interdependence theory (Kelley & Thibaut, 1978; Thibaut & Kelley, 1959) because athletes' developmental experiences reflected the structure and pattern of interactions in the sport settings (Johnson, 2003).

Previous studies have shown how sport, as a general category of youth activities, may influence identity development (Nasco & Webb, 2006), initiative (Larson, 2000), relationships (Dworkin et al., 2003; Hansen & Larson, 2002; Hansen et al., 2003; Larson, 2000; Larson et al., 2006), social capital (Seippel, 2006), and teamwork and social skills (Mahoney, Cairns, & Farmer, 2003; Patrick et al., 1999). However, previous research has not examined how varying levels of task and outcome interdependence might promote the specific developmental experiences examined in this study.

Determining developmental experiences: Interdependence versus sport type

Middle-distance runners were exposed to a different learning environment compared with basketball players. However, interdependence – specifically outcome interdependence – appeared to have a stronger relationship than sport type with the athletes' developmental experiences. This finding highlights a critical distinction between sport type and outcome interdependence and suggests that

greater detail is required to understand and evaluate the developmental processes and experiences that occur in different sport settings, rather than simply aggregating and attributing developmental experiences based upon the general categorization of sport type.

One noted limitation of many past sport type studies was the attribution of findings to different degrees of interdependence and modes of interaction provided by the sport types without explicitly measuring the task and outcome interdependence of the sport setting (Baker et al., 2003; Bredemeier & Shields, 1986; Martens et al., 2006; Rudd & Stoll, 2004; Vallerand et al., 1997; Yoo, 2001). This superficial assumption is particularly worrisome as studies that neglect to evaluate the nature of tasks (task interdependence) and how people interact with these tasks to achieve desired outcomes in the setting (outcome interdependence) may miss critical developmental dimensions of the sport experience. In addition, explanations about sport type differences (and similarities) attributed to interdependence without accurately measuring interdependence may be misleading and cause researchers to neglect other explanations for sport type differences (and similarities) that may not be so readily apparent within and across different sports.

The observed stronger association of outcome interdependence than sport type with developmental experiences suggests that the theory of interdependence (Kelley & Thibaut, 1978; Thibaut & Kelley, 1959) could help to explain differences in athletes' experiences. The theory of interdependence stresses the influence of social interaction in a setting in addition to emphasizing the interrelated influences of other individuals, tasks, and social spheres (e.g. family, school; Johnson, 2003). Different settings with varying levels of interdependence will provide different experiences for those individuals involved (Johnson, 2003). Comparisons between sport types (i.e. team sport vs. individual sport) fail to measure the true nature of outcome interdependence that may be found in different sport settings and even within the same sport.

For example, basketball players at an elite level of competition with highly qualified coaches may engage with the tasks and goals of the sport very differently from players at a recreational level with volunteer coaches. Furthermore, from an athlete's perspective, sport type might include more than simply the athlete's time on the court or at the racetrack. For example, coaches may ask basketball players to train on their own, in a weight room with a teammate, or at the track to improve their speed. Similarly, middle-distance runners might also participate in weight training with a partner,

or participate in other forms of cross training (e.g. yoga, spin classes), all within the context of middle-distance running. Athletes may engage with peers, coaches, and parents in a variety of different ways and in a variety of different physical activities with all interactions reported as comprising critical elements of their primary sport experience. Although specific tasks are critical to our understanding of interdependence, it is also important to consider how individuals socialize and interact with the tasks of the sport in relationship with each other to achieve desired performance outcomes. Based on the findings of the present study, variation in interdependence may lead to a variety of learning environments within a particular sport type that differ more than the learning environments between different sports at similar levels of competition and instruction.

Limitations and future directions

Given that this was the first study to evaluate interdependence, sport type, and developmental experiences in youth sport, the study findings need to be considered within the context of its limitations. First, only two sports were compared. Future studies would benefit from including a more diverse range of individual and team sports. For example, studies could include athletes from sports who compete and train alone (e.g. bowlers) or train alone and compete together (e.g. football punters). Including more sports would help to clarify the influence of different sport types on developmental experiences in addition to providing a better understanding of the nature of interdependence across sport types. A second limitation pertains to the proxy measure used to evaluate the number of years the young athletes were involved in their sport. Given the possibility that the participants may have taken time off from sport (e.g. due to injury) during their development, future research could explore if any voluntary or involuntary breaks from sport impact a young athlete's developmental experiences. A third limitation relates to the level of competition of the athletes. This study used club, select level athletes, who likely represent a sample highly motivated and committed to achieving success in their sport. Future studies could examine the influence of interdependence on athletes at less select levels of competition who might not be so committed to success, but simply interested in the sport as a form of recreation. Previous research by Wilkes and Côté (2010) examined the developmental experiences of youth participating in varying levels of competitive basketball and found that youth had different developmental experiences in less competitive basketball leagues than they did in more competitive basketball

leagues. Would the outcome interdependence of the two settings differ? This awaits further research.

Limitations also relate to the interdependence measures used in the study. The task and outcome interdependence measures exhibited lower reliabilities. This may have been due to the wording of some of the interdependence items and the age of the sample. The adapted interdependence scales were originally developed using adult samples. Further testing and refinement of the items to improve the reliability of the measures are recommended. In addition, perceptions of interdependence were self-reported. As a means to confirm the athletes' perceptions of task and outcome interdependence, objective measures of the interaction patterns of the participants in practice and competition through a novel state-space grid methodology (Hollenstein, 2007) may be fruitful.

A final limitation pertains to the role of socio-cultural context on the study findings. The present study was conducted in North America and did not explore the personal (e.g. socio-economic) and environmental factors contributing to participation by young athletes in their sport. Given the call for greater understanding of the role of culture and personal factors in sport participation (Ram, Starek, & Johnson, 2004), further research is necessary to more deeply understand how the relationships between interdependence, sport type, and developmental experiences may differ in different cultures for different young athletes.

Study strengths

While acknowledging the limitations of the study, the study possesses a number of strengths. The study represents the first attempt to evaluate interdependence and developmental experiences in a youth sport setting. While previous research in sport has independently evaluated developmental experiences in youth sport (e.g. Strachan et al., 2009) and other group dynamic constructs (e.g. cohesion; Eys, Loughhead, Bray, & Carron, 2009) in a youth sport setting, this study represents a novel investigation to begin to understand how group processes such as interdependence contribute to youth experiences in sport and ultimately to youth becoming productive, contributing members of society. Finally, the study supports the need to consider the multi-dimensional nature of interdependence as highlighted in the organizational psychology literature (Van der Veegt et al., 1998; Veegt et al., 2001). Previous research and discussions around the psychological construct of interdependence in sport have neglected to look beyond the interdependence of the task to consider how the patterns of interactions

within individual and team sport contexts may influence an individual's performance.

Implications for coaches and practitioners

Based on the study findings, the promotion of outcome interdependence in a sport setting may be one way to foster a richer learning environment. Coaches in both team and individual sports may define athlete goals and the manner in which athletes will achieve these goals so as to promote individual success as dependent on the success of others. Coaches, parents, and other athletes can promote a positively interdependent sport setting by emphasizing the value of helping others, giving and receiving feedback with others, and encouraging self-reflection. A setting can be structured so that individuals understand the value of mutual influence with others, and respectfully challenge each other's thoughts and behaviours so as to promote specific behaviours and goals that benefit both the group and the individual. A setting structured to promote outcome interdependence will help to facilitate a richer learning environment.

Coaches and parents play a critical role in the lives of young athletes and have the potential to positively or negatively affect their experiences in sport (Baker et al., 2003; Côté, 1999; Fraser-Thomas et al., 2005; Weiss & Raedeke, 2004). The present findings suggest that coaches, parents, and other athletes in the sport setting might have more to do with the developmental experiences of young athletes than the type of sport. Coaches and parents that structure the setting to promote (outcome) interdependence are likely to provide richer learning environments with more positive developmental experiences.

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