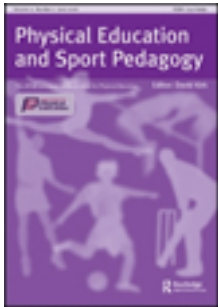


This article was downloaded by: [Bibliothèque Universitaire]

On: 07 January 2013, At: 06:07

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Physical Education and Sport Pedagogy

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/cpes20>

Construction of trust judgments within cooperative dyads

Agathe Evin^a, Carole Sève^a & Jacques Saury^a

^a Laboratoire "Motricité, Interactions, Performance" (EA 4334),
Université de Nantes, Nantes, France

Version of record first published: 21 Dec 2012.

To cite this article: Agathe Evin, Carole Sève & Jacques Saury (2012): Construction of trust judgments within cooperative dyads, *Physical Education and Sport Pedagogy*, DOI:10.1080/17408989.2012.754002

To link to this article: <http://dx.doi.org/10.1080/17408989.2012.754002>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.tandfonline.com/page/terms-and-conditions>

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae, and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand, or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

Construction of trust judgments within cooperative dyads

Agathe Evin*, Carole Sève and Jacques Saury

Laboratoire "Motricité, Interactions, Performance" (EA 4334), Université de Nantes, Nantes, France

(Received 21 December 2011; final version received 18 September 2012)

Introduction: One of the aims of physical education (PE) is to develop social skills such as cooperation, teamwork, and mutual helping among students. Cooperation is a broad research topic, implicating several disciplines in the human sciences (e.g. psychology, sociology, linguistics, philosophy). It is also an important topic in various domains of practice like organizational management, ergonomics, sports performance, and PE and sports pedagogy. Studies in sport have shown that cooperation between partners is not automatically produced by the cooperative structure of the learning tasks.

In this exploratory study, we focused on the links between cooperation and trust judgments about one's partner. We characterized the processes by which students construct trust judgments in dyadic cooperative interactions during climbing lessons. This study was carried out within the theoretical and methodological frameworks of the 'course of action.'

Method: Two middle-school students in 10th-grade participated in this study. They formed a fixed dyad based on personal affinity. During the four climbing lessons under study, the students alternated the roles of climber and belayer. Their behaviors and communications were recorded on video and after each session they participated in self-confrontation interviews. From these data, we then reconstructed their courses of experience and focused particularly on preoccupations, meaningful elements in the situation, and mobilized knowledge. The elements contributing to the construction of the climber's trust judgments about his belayer were identified. Changes in these judgments were characterized in relation to the modes of cooperation between the students. Twenty-seven climbs were analyzed.

Results and discussion: The results showed that the climber's trust judgments focused on two dimensions of the belayer's activity: the reliability of both the belay and his advice for success in the task. To build these trust judgments, the climber combined knowledge about his belayer (the partner's climbing skills, his mastery of safety techniques, his familiarity with the climbing equipment, and his typical attitudes in class) and interpretations of the events during belayer-climber cooperation (the attention shown by the partner, his requests for advice from other students, and the teacher's interventions).

Moreover, the results showed the relationship between the development of each student's trust judgments about his partner and the positive and negative dynamics of cooperation between the students. Three typical connections were identified between the climber's trust judgments about his partner and the climber's involvement in cooperation.

The results are discussed on the basis of two points: (a) the dynamic and composite character of the construction of trust judgments and (b) the construction of trust judgments as a condition for genuine cooperation between students. The students in the situation of climber displayed typical processes to build a trust judgment about their partner, and this trust judgment appears to be an important element in promoting and regulating cooperative interactions between students.

*Corresponding author. Email: agathe.evin@univ-nantes.fr

Conclusions: We propose pedagogical perspectives for teachers with regard to understanding trust judgments in climbing and student cooperation. We also suggest new research perspectives with the objective of fully elucidating the dimensions of trust involved in cooperation.

Keywords: trust judgment; cooperation; climbing; physical education; course of action

Introduction

Physical education (PE) in France, as in many countries, has several aims, one of which is to develop social skills (cooperation, teamwork, mutual helping) (e.g. Ward and Lee 2005). Recent French guidelines concerning the acquisition of a common skill set by all middle-school students specified that one of the priorities was to create favorable conditions in which ‘the student can learn [...] to work as a member of a team’ (National Physical Education Program for Middle Schools 2008). The programs clearly specify that the PE teachers are encouraged to help their students develop ‘methodological and social skills’ so that they can ‘organize and assume social roles and responsibilities by the organization and management of practices and learning: [...] team work and mutual help.’ In this study, we thus examined the phenomena that contribute to the construction of these social skills, and more specifically to the links between cooperation and trust judgments.

Cooperation is a broad research topic and it has been investigated within the context of several disciplines in the human sciences (e.g. psychology, sociology, linguistics, philosophy). This topic has also a major interest in a wide variety of practices, such as organizational management (e.g. McAllister 1995), ergonomics (e.g. Hoc 2001), educational practices (e.g. Johnson and Johnson 2009; Slavin 1983), sports performance (e.g. Weinberg and Gould 2010), and PE and sports pedagogy (e.g. Lafont and Winnykamen 1999). The cooperation between students in PE has been studied from various perspectives, such as peer-assisted learning (PAL) (e.g. d’Arripe-Longueville et al. 2002; Ward and Lee 2005), cooperative learning (e.g. Dyson and Grineski 2001), and didactic analysis (e.g. Amade-Escot 2006; Hennings, Wallhead, and Byra 2010). The empirical studies on PAL and cooperative strategies in PE settings have shown several categories of effects, identified in terms of the motor, cognitive, motivational, and social benefits for students (for a review, see Ward and Lee 2005). Moreover, the study of Hennings, Wallhead, and Byra (2010) used a didactic methodology (Amade-Escot 2005) and showed that the reciprocal style of teaching – which could be considered as one of the PAL strategies – improved students’ knowledge and performance within dyads in indoor climbing tasks. The authors attributed these improvements to within-climb and post-climb peer feedback, dialogue, and idea sharing, all of which characterize types of student cooperation. These authors nevertheless showed that the positive effects were most evident when the tasks required lower-complexity climbing skills and when the peer interactions aligned with the task criteria provided by the teacher (Hennings, Wallhead, and Byra 2010).

The definition of cooperation has historically been based on social interdependence theory, as proposed by Deutsch (1949). According to this theory, cooperation is a situation of positive interdependence between individuals, that is to say,

when there is a positive correlation among individuals’ goal attainments. In this kind of situation, individuals perceive that they can attain their goals if and only if the other individuals with whom they are cooperatively linked attain their goals. Positive interdependence results in promotive interaction (i.e., individuals encouraging and facilitating each other’s efforts to complete tasks in order to reach the group’s goals) (Johnson and Johnson 2009, 366).

Conversely, negative interdependence is when individuals' goal achievements are negatively correlated. Negative interdependence results in oppositional interaction (i.e. individuals discouraging and obstructing each other's efforts to complete tasks in order to reach their goals) (Johnson and Johnson 2009).

One of the main assumptions of this theory is that the cooperative task structure, notably how participants' goals are structured, determines the way people interact. Certain researchers, however, have recently tried to define cooperation with regard to the nature of partners' cognitive activities during their interactions. In particular, Castelfranchi (1998, 162) introduced the notion of interference to characterize how individuals interact as they cooperate. He observed that interference arises because 'the effects of the action of one agent are relevant for the goals of another: i.e. they either favour the achievement or maintenance of some goals of the other's (positive interference), or threaten some of them (negative interference).' This orientation seems to be promising because several studies have shown that the cooperation between partners is not automatically produced by the cooperative structure of tasks (e.g. Cicourel 1994; Saury 2008). Cooperation among teammates is instead fluctuating and unstable in the sense that complex interpersonal coordination processes affect the dynamics of cooperative interactions. Cooperation refers to the various and subtle modalities of social interaction in which mutual trust seems to be crucial (Castelfranchi 1998; Tuomela and Tuomela 2005). As an illustration, the cooperation observed on sports teams (e.g. basketball, doubles table tennis) involved processes of inquiry and monitoring of others' activity as part of each teammate's activity, as well as processes of masking or displaying only certain personal activity components (Poizat et al. 2008, 2009). These processes as a whole reflect ongoing mutual evaluation and influence among athletes, suggesting that they continuously estimate one another's reliability regarding the collective task, build trust judgments about their respective activities, and adapt their modalities of cooperation accordingly (Saury 2008).

In the workplace, Jones and George (1998) also highlighted the interdependence of cooperation and the experience of trust. They defined trust as

the willingness of the party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party.

Trust involves a ternary relation in which 'A trusts B to do Y' (Hardin 1999). According to this definition, although trust in others may include several dimensions – cognitive, affective, and moral – it also concerns a task or a particular activity. Trust can be considered as 'task-oriented' (i.e. trust in one's partner for a particular task does not necessarily extend to other tasks).

In the PE setting, Butler and Hodge (2001) evaluated the benefits of social interactions for learning in terms of trust among students. The study was carried out in softball with ninth-grade students. The results described instantaneous states of student trust in their partners at the end of the cooperative learning unit and provided support for a connection between trust and cooperation in PE. The findings also suggested the importance of characterizing the dynamic processes underlying the construction of trust in others. In this study, we investigated the construction of students' trust judgments about their partner and the influence of these judgments on the modalities of cooperation between them during a wall climbing task. Our study specifically sought to respond to the following questions: What are the trust judgments of one's partner based on? What elements contribute to the construction of trust judgments? How do they change over time? What are the relationships

between trust judgments and cooperation? Wall climbing was chosen because of the high importance of cooperation that is required between students: (a) each student has a predefined role in the task – climber or belayer – which defines their respective activities as closely interdependent, (b) the students can only succeed in the task by cooperating as they carry out their respective roles, and (c) the subjective risk for the students (e.g. the fear of falling) requires them to have a high level of trust in their partner.

Our study was conducted within the course-of-action framework (Theureau 2004, 2006) which has been used to analyze students' activities in PE (e.g. Guillou and Durny 2008) and the modalities of coordination in sport (e.g. Bourbousson et al. 2010). The methodology of the course-of-action framework relies on videotaped recordings collected in real situations, and then self-confrontation interviews in which the actors viewing the videotapes are urged to recall and explain what they were experiencing at that time (Theureau 2006). We chose this framework for three main reasons. First, student activity in real situations can be studied using this framework. We believe that studying student activity in real classroom situations is essential, given that teaching is a complex activity (Amade-Escot 2006; Rovegno 2006) that precludes the possibility of experimentally reproducing these situations. Second, this framework accords a central role to students' perspectives (Dyson 2006). The course-of-action framework provides access to preoccupations, sensations, perceptions, interpretations, emotions, and the knowledge constructed and mobilized by students during activity. This change in perspective enriches the understanding of researchers: It is an excellent opportunity to put into relation what they see and what students experience. Third, this framework provides a means to articulate epistemological and transformative issues (Sève et al. 2006). The course-of-action framework is a semiological approach to activity: through the techniques of the self-confrontation interview, activity can be reconstructed as it was experienced by the students. This level of description is a complement or alternative to other forms of description providing insight into PE activity. When the level of activity that is experienced by the students is examined, pertinent descriptions and explanations in the PE context are quite likely to result. This opens up a new perspective on PE situations because the student's experience is taken into account. New knowledge about PE situations can emerge and inspire the design of original types of teaching and training.

The students' activity was studied according to the theoretical construct of the 'course of experience' (Theureau 2006), which corresponds to

the activity of a given actor engaged in a given physical and social environment, where the activity is meaningful for that actor; that is, he/she can show it, tell it, and comment upon it to an observer–listener at any instant during its unfolding (Theureau and Jeffroy 1994, 19).

This meaningful activity can be described by the actor in terms of actions, sensations, perceptions, focuses of attention, intentions, emotions, and interpretations (Theureau 2006). The students' courses of experience were reconstructed in order to document the construction of trust judgments by the student who was the climber about his belayer. We then sought to identify how these trust judgments fostered or weakened the climber's cooperative involvement with his partner.

Method

Participants and study situation

The study was conducted in a 10th-grade class during a climbing unit of seven lessons. Rights and confidentiality of research participants were respected following the APA

Ethics Code Standard. The purpose of the study, the conditions for data collection, and the assurance of confidentiality were presented to the teacher, the school principal, and the parents of the students, all of whom formally agreed to the study. A period of familiarization with the researcher in the class took place over two lessons before the climbing unit began. Two students, called Nicolas and Raphaël in the remainder of the article, were selected among other students to participate in this study. Three main reasons were considered in this choice: (a) these two students volunteered to individually participate in self-confrontation interviews after each lesson, (b) they were in the same dyad during all lessons, and (c) they had free time immediately after lessons, for the self-confrontation interviews. Both had experience in climbing from seventh-grade PE classes. Moreover, Raphaël practiced climbing at the sports club of the middle school. Their activity was investigated over four lessons of the climbing unit (Lessons 3, 4, 5, and 6), for a period of two hours each. All the students worked in fixed dyads based on personal affinity throughout the climbing cycle. All lessons were held in a gymnasium equipped with an artificial climbing wall. The students' activity was studied each time they worked together to prepare or make an ascent of the wall, with one of them assuming the role of belayer and the other, the role of climber. Twenty-seven climbs lasting an average of four minutes were analyzed. At the beginning of each lesson, the teacher gave instructions about the task and assigned each dyad a route to climb (Table 1). The students then went to their route and began to work. The teacher supervised the class from a distance and only stepped in occasionally to give advice or guidance. For Nicolas and Raphaël, he stepped in four or five times during each of the four lessons. These interventions were initiated by the teacher himself or in response to a request from the students.

Data collection

Audio and video recordings were made during the four lessons with two video cameras equipped with high fidelity microphones. One camera recorded the students' behaviors and communications. The other camera recorded the teacher's behaviors and communications, thereby providing access to his interventions with regard to the class and Raphaël and Nicolas.

Table 1. Description of learning tasks assigned by the teacher.

	Generic description of the learning task
Teacher's instructions	Reminder of the safety rules Description of the task objective: <i>You're going to climb the route three times. Each time you have to locate the point that you arrived at and for the following climbs you need to go a little higher and grab at least one hold above it.</i> Description of the conditions for carrying out the task: <i>You're going to be top-roping, so one climber and one belayer.</i> <i>You can only use one color for the holds.</i>
Students' roles	The students alternated between climber and belayer for each climb Of the 27 climbs, Raphaël went 14 times and Nicolas went 13 times
Number of climbs	Lesson 3: Raphaël 3 climbs, Nicolas 3 climbs Lesson 4: Raphaël 4 climbs, Nicolas 3 climbs Lesson 5: Raphaël 4 climbs, Nicolas 4 climbs Lesson 6: Raphaël 3 climbs, Nicolas 3 climbs
Difficulty of the route	Height of the route: 9 meters Two overhangs in the route

The students' retrospective verbalizations were recorded during individual self-confrontation interviews (Theureau 2006), which lasted an average of 54 minutes and were conducted at the end of each lesson. During these interviews, the student and researcher viewed the recording and the student was invited to describe and comment on his activity step by step. Specific prompts were used to encourage the student to re-experience the dynamic situation and to obtain information concerning the actions, sensations, perceptions, focuses of attention, intentions, emotions, and interpretations that accompanied the recorded activity. Each student was asked to describe his actions precisely ('What are you doing?'), sensations ('What sensations are you experiencing?'), perceptions ('What are you perceiving?'), attention ('What has your attention?'), intentions ('What are you trying to do?'), emotions ('What emotions are you experiencing?'), and interpretations ('What are you thinking about?'), at every moment of his course of action, according to the principles of the self-confrontation interview guide (Theureau 2006). The interviews were video recorded in their entirety.

Data processing

The data were processed in four steps: (a) construction of a two-level protocol, (b) construction of each climber's course of experience, (c) identification of the elements involved in the construction of the climber's trust judgments about his belayer, and (d) analysis of the connections between trust judgments and the climber's level of cooperative involvement.

Construction of a two-level protocol

The recordings of behaviors and communications in the situation, and verbalizations during the self-confrontation interview, were fully transcribed in accordance with Jefferson's conventions of transcription (Jefferson 1984). They were then organized into a two-level protocol to synchronize the recorded data collected in situ, including a description of the task assigned by the teacher and his interventions regarding Raphaël and Nicolas during the lessons (level 1) and the retrospective verbalizations collected during the self-confrontation interview (level 2) (Table 2).

Construction of each climber's course of experience

Every time the climbing task was carried out, the flow of the climber's activity was segmented into units of the course of experience, on the basis of an analysis of the two-level protocol. By hypothesis, the course of experience is a chain of discrete meaningful units of

Table 2. Excerpt from a two-level protocol table.

Column 1	Column 2
Students' actions and communications Raphaël arrives at the top of the wall and announces 'At the top, Nicolas!' Nicolas responds 'Belay on!' and Raphaël begins to descend by grabbing onto holds.	Raphaël's self-confrontation interview <i>There, I told Nicolas that I was at the top and that he had to belay me. And there the teacher said to let go because Nicolas was ready to belay me but I didn't have much confidence in him. Nicolas likes to joke around and also he wasn't paying a lot of attention to what he was doing so maybe by mistake he could let go, and I thought I could fall.</i>

activity emerging from the interaction between an actor and an environment. These units can be actions, sensations, perceptions, focuses of attention, intentions, emotions, and interpretations, and all have an underlying structure of several components (Theureau 2004, 2006). In this study, we were particularly interested in three of these components: (a) the preoccupations of the climber, (b) the elements the climber was taking into account in the situation, and (c) the elements of knowledge that were mobilized or constructed. These three components were documented using a specific set of questions about the data in the two-level protocols.

We identified the student's preoccupation at a given moment by asking the following question about the data: What are the significant concerns of the student in the situation? In the example, Raphaël was involved in descending by the climbing route (Table 2).

We identified the elements of the situation that were significant to the student at this moment by asking the following questions about the data: What is the significant element in the situation for the student? What element of the situation is the student considering? In the example, the meaningful element for Raphaël was the arrival at the top of the wall (Table 2).

We identified the knowledge elements used and constructed by the student by asking the following question about the data: What knowledge is being constructed, validated, or invalidated by the student? In the example, the element of knowledge used by the student was 'Nicolas likes to joke around' (Table 2).

Identification of the elements involved in the construction of the climber's trust judgments about his belayer

The climber's course of experience was systematically examined to identify the components that reflected the construction of trust judgments about his partner. This examination consisted of a comprehensive analysis of the contents of each component of the meaningful units in order to characterize the trust judgments. For example, the knowledge mobilized by Raphaël (climber) during one of his climbs: 'Nicolas doesn't always pay attention and he likes to joke around,' was identified as an element in the construction of Raphaël's trust judgment about Nicolas at that moment (Table 2). Thus, the three components of each unit of the course of experience were systematically analyzed to identify the characteristics of the belayer's activity on which trust judgments were based, and the elements that contributed to changes in these trust judgments during the climber's course of experience.

Analysis of the connections between trust judgments and the climber's involvement

To understand the connections between trust judgments and cooperation, the moments during which the climber accepted or refused the assistance or advice of his partner were analyzed. The climber's involvement was described as 'cooperative' when he accepted the assistance or advice of his partner. It was described as 'not cooperative' when the climber ignored the offers to help and advice from his partner. These two forms of climber's involvement were compared with his trust judgments during the same task.

Results

The results are presented in four parts: (a) the focus of the climber's trust judgments about his partner, (b) the elements contributing to the construction of these trust judgments, (c) the

typical forms of change in the climber's trust judgments about his partner, and (d) the typical connections between trust judgments and the climber's involvement with his partner.

The focus of the climber's trust judgments about his partner

Two aspects of the partner's activity were the focus for trust judgments in the climber's course of experience: his reliability in performing the belay task and the quality of his advice in helping the climber to perform his own task.

The partner's reliability in performing his task

The climber built trust judgments about the capacity of his partner to ensure his safety, i.e. to hold him with the belay rope in the event of a fall and to control the speed of his descent at the end of the climb. These trust judgments were manifested in contrasting ways in the climber's course of experience.

In some cases, the climber expressed worries or doubts about his partner's reliability and hesitated to take risks during the climb. He used maneuvers he was already familiar with and looked for big holds so that he could easily grab onto the wall and avoid a fall. In other cases, however, the climber was focused on the climb with no particular concern about his partner's reliability, even to the point of deliberately taking risks of falling. He tried unfamiliar maneuvers, grabbed holds that placed him in unstable positions, or chose to follow difficult routes (e.g. a difficult incline). For example, Nicolas commented on a difficult passage during his third climb (Lesson 5) as follows:

... I don't really know what to do [to climb], so I try to grab a small hold above me (...). I know that if I fall, it'll be OK, I know Raphaël is belaying me and I can feel that the rope is tight.

The reliability of the partner's advice

The belayer frequently gave advice to the climber to help him before, during, or after the climb. This advice concerned how to use the climbing equipment, the choice of climbing route, the choice of holds during the climb, and the maneuvers to make to grab certain holds or to descend. The climber thought that the advice was more or less reliable, depending on the circumstances of each climb, and consequently accepted or refused to follow it.

For example, during a climb in Lesson 4 when the students were able choose the route on their own, Raphaël hesitated in making his choice. Nicolas advised him to choose either the route with the 'red holds' or the one with the 'yellow holds,' saying:

... the teacher said that if you finish the green one, you can do another one. You can choose the red or the yellow, which is a little harder than the red.

Taking into account that Nicolas had asked the teacher's advice, Raphaël decided to follow it and explained this decision during the self-confrontation interview:

'I had just done the green route so I wanted to try another one and Nicolas told me to take the yellow or the red because he had just asked the teacher. So here I'm going to try the yellow.'

In contrast, the following example illustrates the case of making a judgment that his partner's advice has low reliability and thus refusing to follow it. After the preceding

episode, Raphaël tried the route with the ‘yellow holds’ but quickly found himself in trouble, as he was unsure of which holds to grab. At the same time, Nicolas encouraged him, drawing closer to advise him and point out the path he would have taken: ‘... but look, Raphaël, you can go this way and then grab the big yellow handhold there’ [Nicolas demonstrates this by climbing the wall]. Raphaël watches him and then responds without conviction: ‘Yeah, well I’m not sure those are the best holds.’ He then tries again to climb along the yellow route, but does not use the holds suggested by Nicolas. Indeed, Raphaël had little trust in the reliability of his partner’s advice about the choice of holds, as he underlined in the self-confrontation interview:

... there, Nicolas has showed me which holds he would have used to climb. But I really don’t agree with him so I’m going choose other holds and I think to myself that I’m not sure Nicolas really knows what route to take because he didn’t manage to climb to the top with the green route just now and it was easier than the yellow one.

Elements contributing to the construction of the climber’s trust judgments about his partner

The climber’s trust judgments about his partner were constructed in relation to two categories: knowledge about his partner based on past interactions with him and the meaningful elements of the situation for the climber during the specific task.

Knowledge about his partner

The climber mobilized knowledge about his partner that had been constructed during past interactions in order to construct trust judgments. This knowledge concerned: (a) the partner’s climbing skills (e.g. his past climbing experience and the abilities developed in this sport), (b) his mastery of safety techniques (e.g. his ability to lower his partner), (c) his familiarity with the climbing equipment (e.g. harness, belay brake), and (d) his typical attitudes in class (e.g. attentive or joking around). For example, Nicolas knew that Raphaël had experience in climbing with a sports club in their middle school. This knowledge favored the construction of positive trust judgments about his reliability as a belayer and his advice when Nicolas was in the situation of climber. Symmetrically, Raphaël knew that Nicolas had little experience in climbing and that he was not very familiar with belaying techniques, as he stated in his self-confrontation interview: ‘[...] Nicolas was less comfortable than me, he told me that he didn’t remember the belaying moves. And then, he’s never done any climbing with a sports club.’ This knowledge tended to limit his trust in Nicolas’s advice and his reliability as a belayer, especially in the first lessons.

The meaningful elements of the situation for the climber

Three categories of elements in the situations that were meaningful for the climber contributed to reinforcing or reducing the strength of his trust judgments about his partner: (a) the attention shown by the partner, (b) his requests for advice from other students, and (c) the teacher’s interventions.

For example, the attention to the climber shown by the partner was a particularly meaningful element for the climber and it was a major consideration in the construction of his trust judgment about the belayer’s reliability. The climber assessed the partner’s attention using two main perceptual modalities: visual and/or auditory, and proprioceptive. First, the climber judged the belayer’s attention level based on what he could see or hear of

his behaviors and communications. As an illustration, during his first climb (Lesson 3), Raphaël heard Nicolas talking with the girls in a nearby group and he reproached him by asking him to stop chatting with them. He commented on this incident as follows in the self-confrontation interview: ‘I told Nicolas to stop talking with the others (. . .) I said to myself that if he talks too much with them and stops paying attention to me, I’ll fall and get hurt.’ The belayer’s attention to the climber was also perceived by proprioceptive sensations associated with the tension on the rope linking the two partners. As an illustration, during a climb in Lesson 4, Raphaël felt that the rope was slack while he was climbing and called out to Nicolas (the belayer) in the following way: ‘Hey, what are you doing, Nicolas? (. . .) I felt the rope go slack, so pay attention to what you’re doing!’ The sensation of a slack rope contributed at that moment to a drop in Raphaël’s confidence in his belayer, as he stated in his self-confrontation interview: ‘There, I tell Nicolas to pay attention because I can feel that he is not holding the rope tight enough (. . .) I know that sometimes he doesn’t pay enough attention (. . .).’

Typical forms of change in the climber’s trust judgments about his partner

Two typical forms of change in the climber’s trust judgments about the belayer were identified in the climber’s course of experience during the analyzed tasks: a positive change in trust judgments (increased trust) (12 climbs) and a negative change in trust judgments (decreased trust) (4 climbs). Eleven tasks displayed no change in the climber’s trust judgments about the belayer.

Positive change in trust judgments

A positive change in the climber’s trust judgments about the belayer was indicated in climbs during which judgments were transformed and led to a higher level of trust at the end of the climb than in the beginning. As the climber continued on his ascent, he modified his interpretations: typically, at the beginning of the climb, he assumed that his partner was not especially reliable in his role of belayer and/or that his advice was not particularly pertinent; by the end of the climb, however, he thought that his partner was more reliable and/or that he was giving better advice. These changes could be either continuous or discontinuous. In the latter case, the positive change in trust judgment could be interrupted or even show several marked changes during the same climb. In the 12 climbs with positive changes in the climber’s trust judgment about the belayer, seven showed continuous change and five were discontinuous.

For example, during Raphaël’s first climb (Lesson 3), the positive change in his trust judgment showed three steps. First, just before the climb, Raphaël tested and explored Nicolas’s reliability as a belayer, given his knowledge of some of Nicolas’s typical behaviors (‘Nicolas lacks of concentration,’ ‘Nicolas likes to joke around’). Raphaël was sensitive to the fact that Nicolas correctly used the standard communication by the students before starting (‘Ready?’ ‘Ready!’ ‘Start!’). He thus started up a route with sufficient trust to focus exclusively on his climb, as he remarked in the self-confrontation interview: ‘I’m focusing on the holds, which one I’m going to grab next, and then the next . . .’ Then, when he felt ‘stuck’ in his climb, his perception of a verbal exchange between Nicolas and another student weakened his trust judgment about Nicolas’s reliability.

There, I was stuck because I didn't know quite what to do and I said to myself that Nicolas shouldn't be talking to other students. I thought if he's talking too much with them and isn't paying attention to me.

Third, Raphaël's trust judgment coincided with an order from the teacher: 'Nicolas told you to come down! Let go, Raphaël!' This completely changed his level of trust judgment. Raphaël let go because of the teacher's insistence and his [the teacher's] closer supervision of Nicolas's belay. He was lowered by Nicolas, which let him gradually reconstruct a positive trust judgment. In the self-confrontation interview, he commented on this: 'He [the teacher] told me again to let go and I finally did and let Nicolas lower me without holding on, and I said to myself "Hey, this is pretty cool."'

Negative change in trust judgments

A negative change in the climber's trust judgments was indicated in tasks during which these judgments were transformed and led to a lower level of trust at the end of the task than in the beginning. As he continued on his ascent, the climber modified his interpretations: typically, at the beginning of the climb, he assumed that his partner was reliable in his role of belayer and/or that he was giving good advice; by the end of the climb, however, he thought that his partner was less reliable and/or that he was giving less pertinent advice.

For example, during a climb in Lesson 4, Nicolas was concerned about 'putting the harness on correctly' before the climb. First, he asked Raphaël to help him to tighten the harness ('Tighten it for me, Raphaël, would you? I can feel it's not tight enough!'). Raphaël replied that the harness was tight enough, which temporarily reassured Nicolas as he knew Raphaël was skilled in climbing and knew the belay equipment (Nicolas: 'OK, if you think so.'). Then, just before the climb, Nicolas again asked for Raphaël's opinion ('Hey, but seriously, look Raphaël, I was just able to slip my hand in [inside the harness]!'). He relied on prior knowledge, such as 'I've never been able to slip my hand into the harness like that' and 'The teacher said it was supposed to be really hard to slip our hand into the harness.' Raphaël's answer ('But it's OK, you're not going to fall through.'), made Nicolas doubt the reliability of his advice. Third, Nicolas questioned the teacher ('I feel like my harness is not tight enough.'), who immediately tightened it. At this moment, Nicolas strengthened his judgment that Raphaël's advice was unreliable, as he explained in the self-confrontation interview:

I had never been able to slip my hand in like that, I didn't understand (...) and then the teacher comes over (...) he said that it should be hard to slip your hand in (...). So, Raphaël was wrong.

Typical connections between trust judgments and the climber's involvement

Three typical connections were identified between the climber's trust judgment about his partner and the climber's involvement in the cooperation: (a) a high trust judgment of his partner linked to cooperative involvement, (b) a low trust judgment of his partner linked to non-cooperative involvement, and (c) a low trust judgment of his partner linked to cooperative involvement.

High trust judgment of his partner linked to cooperative involvement

Fifteen climbs corresponded to situations in which high trust judgments of his partner were linked to the climber's cooperative involvement (Raphaël was the climber six times, and Nicolas nine times). For example, during Nicolas's first climb (Lesson 3), he felt that he

was in trouble when he arrived at a sharp incline. Perceiving that his grip on the holds was slipping, Nicolas called out ‘Hold me!’ to Raphaël. At this moment, Nicolas’s trust judgment about his partner’s belay skills was high. Nicolas felt that Raphaël was attentive and that he could trust his advice because he had just successfully climbed the same route. In addition, Nicolas felt that the rope was tight, which increased his judgment of reliability. As he said in the self-confrontation interview: ‘There, I thought I was going to slip and I had a hard time at that spot, but it turned out OK. I could feel that Raphaël was there and the rope was really tight.’ Raphaël tightened the rope and advised Nicolas about which holds to choose: ‘Raise your foot to the right. And then look for the big green handhold with your left hand.’ Nicolas immediately followed this advice.

Low trust judgment of his partner linked to non-cooperative involvement

Nine climbs corresponded to situations in which low trust judgments of his partner were associated with the climber’s non-cooperative involvement (Raphaël was the climber six times, and Nicolas three times). For example, in Lesson 4, Nicolas was observing Raphaël fix the brake on his harness and pointed out that he had made a mistake. This remark set off a confrontation in points of view between the two students:

Nicolas: You’re still wrong, Raphaël! *Raphaël:* No . . . not at all! *Nicolas:* Yes, you are, look! [Nicolas takes the rope out of Raphaël’s hands]. *Raphaël:* But I know what I’m doing! *Nicolas:* No, you don’t . . . *Raphaël:* You don’t think I’m going to do it like that! [he passes him the belay rope on the right side of the brake] *Nicolas:* There. But . . . [he comes to help Raphaël] Look! No, look. *Raphaël:* Wait . . . but I can do what I want, it’s fine! [Raphaël pushes Nicolas away as he tries to help].

At this moment, Raphaël felt that Nicolas was in no position to give him advice since he was a beginner, had never used this type of brake, and he had himself explained how to use it only a few minutes ago. Based on this knowledge, Raphaël did not accept Nicolas’s advice and explained himself as follows in the self-confrontation interview:

Nicolas says that I made a mistake (. . .), but I thought I was right, I thought that it was right the way I had done it [the brake], in fact, no, I realized I was supposed to turn the rope.

Low trust judgment of his partner linked to cooperative involvement

Three climbs corresponded to situations in which low trust judgments of his partner were associated with the climber’s cooperative involvement (Raphaël was the climber twice, and Nicolas once). For example, Raphaël had just finished his climb in Lesson 3 and had asked the teacher for advice on tying his bowline knot. Now it was Nicolas’s turn to climb and tie the knot. Not sure of what to do, Nicolas asked Raphaël: ‘Can you tell me how to tie the bowline knot, Raphaël, because I don’t really remember.’ Raphaël began to show him. At this moment, Nicolas had a high trust judgment of Raphaël and assumed he had greater climbing skill and better ability at belay techniques. However, during the demonstration, Nicolas told Raphaël that it was impossible to have the two ropes with one on top of the other: ‘Raphaël, you can’t do a knot like that’ [he points out the overlap of the ropes]. Raphaël realizes he has made a mistake. Nicolas has a doubt now about Raphaël’s skill with the bowline knot, as he noted in the self-confrontation interview: ‘In fact, I was right because he had the rope on top [of the other] and it wasn’t right, so there we say “this won’t work” and we undo everything.’ He then accepted his assistance later in their interaction when he was trying to learn to tie the bowline knot.

Discussion

The results of this study are discussed on the basis of two points: (a) the dynamic and composite character of the construction of trust judgments and (b) the construction of trust judgments as a condition for genuine cooperation between students.

Dynamic and composite character of the construction of trust judgments

During the wall climbing learning task, the students in the situation of climber developed activity aimed at assessing their partner's reliability as the belayer. The judgments they built focused on two dimensions of the partner's activity: his reliability as a belayer and the reliability of his advice. At every moment, these judgments about reliability were involved in the construction of trust judgments, which changed over the course of the task. Our results revealed two characteristic types of change in the climber's trust judgments about his belayer: positive (continuous or discontinuous) and negative. These results are in line with the findings of other studies on the role of trust judgments in cooperation and teamwork in work settings (Jones and George 1998). These studies emphasized that when one party signals positive expectations or favorable attitudes to another and the other reciprocates these expectations, trust spirals upward. Conversely, when expectations are not reciprocated, trust spirals downward (Butler 1983). However, our results also showed that these changes can quickly switch direction during the same lesson. Three elements played an essential role in this alternation in the construction of trust judgments: (a) the composite and dynamic nature of trust judgments, (b) the diversity of the elements contributing to the construction of trust judgments, and (c) the processes specific to the construction of trust judgments.

The composite and dynamic nature of trust judgments

At every moment, the climber's trust judgment about his partner was the synthesis of his assessment of two dimensions of his partner's activity: his reliability as a belayer and his reliability as a guide. According to the characteristics of the situation experienced by the climber, one or the other of these dimensions was particularly significant for the climber. Our results particularly indicate that the risk of falling was one of the salient characteristics of the situation that most influenced the relative importance of these two dimensions. This was the case when the climber was at the top of the wall. At this moment, the belayer's reliability in lowering the climber safely was of major importance. Conversely, when the climber felt safe and his chief worry was reaching the top of the wall, the reliability of his partner's advice became most important. Thus, mutual trust between partners can be seen as a 'multidimensional construct' in student activity (Jones and George 1998), integrating several dimensions. This idea is similar to that of Butler and Hodge (2001), who described various aspects of trust judgments in others during PE classes.

The climber's trust judgment of his partner was not stable at all times. It fluctuated between lessons, during the same lesson, and even during a single climbing task. It was constantly deconstructed and reconstructed, despite the fact that the students in this study were allowed to choose their dyad partners on the basis of affinity and thus knew each other well and liked each other.

The diversity of elements contributing to the construction of trust judgments

The elements contributing to the construction/deconstruction of trust judgments about one's partner were either knowledge about the partner or personally meaningful events occurring

in the situation. This finding converges with those of studies that have examined the relationship between trust, monitoring, and cooperation in interpersonal and intergroup relationships (Ferrin, Bligh, and Kohles 2007). Trust judgments seem to be greatly based on knowledge about the partner (Sheppard and Tuchinsky 1996) that leads to positive expectations about this person (Sitkin and Roth 1993). These elements contributed to specifying the two dimensions of trust judgments in our study. For example, knowledge about his partner (e.g. his attitudes in the classroom) and certain meaningful elements of the situation (e.g. the partner's behaviors or communications) both contributed extensively to the construction of trust judgments about the partner's reliability as a belayer. On the contrary, knowledge about the partner's climbing skills was more often mobilized for constructing trust judgments about the reliability of his advice.

These results suggest the need to better understand how the formation of dyads (based on criteria of affinity and/or expertise) influences the construction of trust judgments and cooperation. We studied an affinity dyad and each student had constructed different knowledge about the expertise of his partner, which corresponds to the definition of an asymmetrical dyad of peers (d'Arripe-Longueville et al. 2002). Nicolas felt that Raphaël had a good climbing level, whereas Raphaël felt that Nicolas was not very good at climbing. One can speculate that this difference in perceptions of one's partner's skills influenced the relationship between trust judgments and cooperative involvement. Indeed, in nine of the 15 climbs in which a high trust judgment of his partner was linked to cooperative involvement, Nicolas was the climber. In contrast, in six of the nine climbs in which a low trust judgment of his partner was related to non-cooperative involvement, Raphaël was the climber. Although this interpretation is speculative and cannot be firmly established by the empirical results of this study, it is plausible that perceiving one's partner as skilled at climbing facilitates the construction of trust judgments and cooperative involvement. Nevertheless, our results also show that during the lessons each student showed evidence of exploring and monitoring his partner's activity, which could have altered perceptions of the partner's immediate, here-and-now reliability as a belayer. These results support the findings of Huet and Saury (2011), who hypothesized that the mutual exploration of partners' activity in PE leads the partners to 'model' their respective skills and constantly monitor the status of the partner for any change with regard to these skills. These results also confirm the findings of previous studies on expert sports dyads: table tennis doubles and sailing crews (Poizat et al. 2008; Saury 2008). These authors found that the athletes monitored their partner's activity during team performance. This activity was accompanied by the construction of a here-and-now model of the partner's ability to perform successfully, which affected the degree of reliability accorded to his or her actions, which in turn affected the modalities of cooperation. Our results similarly suggest the hypothesis that in the PE climbing classes, each student was also building a 'model' of his partner's skills in the roles of climber and belayer and that this model affected the trust judgments and cooperative involvement. The model depended not only on prior knowledge of the partner but also on judgments about his activity in the current situation.

The specific processes in the construction of trust judgments

The students in the situation of climber displayed two typical processes to build a trust judgment about their partner: exploration and 'critical vigilance.'

The process of exploration consisted of activities leading each climber to constantly 'model' his partner's skills in climbing, particularly his skills as a belayer. These activities

resulted in typical behaviors: frequent glances toward his partner or sharp reminders to pay attention to his belay needs. The climber thus shaped trust judgments about specific dimensions of the partner's activity, as, for example, his reliability as a belayer. This findings are similar to the findings of studies of high-level sports teams (Bourbousson et al. 2010; Poizat et al. 2008, 2009; Saury 2008), which have shown that members of the same team explore their teammates' behaviors and construct knowledge about their activities and performances during the course of table tennis matches, basketball matches, or sailing regattas. This process of exploration, which aims to build a model of the other protagonists of the situation, thus seems inherent to various cooperative interactions, whether learning or competitive sports situations.

Our results also describe for the first time a process we call 'critical vigilance,' which was observed as the students cooperated in the climbing task. This process was noted when the students were advising each other during a climb or during interactions with one student spontaneously guiding the other. Critical vigilance was manifested when the student being given advice by the student acting as mentor doubted the correctness of the advice, even though the partners had asymmetrical skills in climbing. For example, Nicolas, although he knew he had fewer climbing skills than Raphaël, disagreed with his advice on several occasions and suggested other options. This process suggests that the students mobilized knowledge related to the possibility of their partner's failure or error, even when this partner had greater experience and skill in the sport.

The construction of trust judgments as a condition for genuine cooperation between students

The climber's trust judgments about his belayer influenced the modalities of cooperation between the students. In the situation examined in this study, the cooperation between the climber and belayer was expressed essentially by the belayer's offers of advice or his willingness to help the climber in his task. This assistance was not always accepted and depended on the climber's trust judgment about his partner. Our results highlighted two typical forms of connection between the construction of trust judgments and the climber's cooperative involvement with the belayer. In 15 of the 27 analyzed climbs, the climber's high trust judgment of his belayer was associated with a willingness to accept his help and advice. As shown by recent analyses of the workplace, the perceived trust between members of the same team can significantly influence the level of cooperative involvement and teamwork (Ferrin, Bligh, and Kohles 2007; McAllister 1995; Sheng, Tian, and Chen 2010).

In addition, our results support the idea that when trust spirals upward (Butler 1983), student interactions become cooperative, and conversely, when trust spirals downward, these interactions become progressively uncooperative. Although our study has clear limitations, mainly due to the small number of participants, we nevertheless can draw a few parallels between our findings and those from studies on cooperation in sports teams (Poizat et al. 2008, 2009; Saury 2008). In these studies, the modalities of cooperation between partners were observed to fluctuate during competition, depending on the interpretations and evaluations constructed by each member about the others' activities or skills. The construction of trust judgments about one's partners therefore appears to be an important element in promoting and regulating cooperative interactions between students and is similar to what occurs in the relationships between partners in diverse athletic situations. More generally, this result supports the idea of a close interdependence between trust and cooperation in group contexts (Tuomela and Tuomela 2005).

Conclusion

The results of this study highlight how students build and update trust judgments about their partner's activity during cooperative tasks. They also describe the typical connections between trust judgments and students' level of involvement in genuine cooperation with their partners. They provide support for the hypothesis that the construction of mutual trust between students influences the modalities for cooperation in PE learning tasks. This phenomenon may be particularly marked in sports that involve physical risk-taking and intense emotional commitment (e.g. climbing, acrobatic gymnastics). More specifically, our study points to some of the conditions necessary for cooperation in PE learning tasks for which one student is actively involved in ensuring the safety of his or her partner, as in the case of climbing. Our results show that genuine cooperation is highly dependent on the construction of trust judgments regarding the partner's ability to guarantee one's safety: students are unable to truly cooperate if they have not constructed a sufficient level of trust in their partner. The construction of a judgment of trust in one's partner can thus be considered as the prerequisite for accomplishing collective tasks and learning in PE situations that require one student to ensure the safety of another.

This study was exploratory and the dyad was based on the affinity of two students with different skill levels. For this reason, our findings cannot be transferable to other educational settings without great caution. They do, however, provide encouragement for future studies of student dyads with different characteristics (affinity/no affinity, same skill levels/different skill levels). Such studies, with a focus on the processes of constructing trust judgments between students and the influence of these processes on the modalities of student cooperation, could help to clarify the various dimensions of trust involved in the cooperation among PE students.

These findings have consequences for teachers, as well, and three directions can be considered. The first consists of new contents for programs to train PE teachers. Content could be added to give teachers a greater understanding of the connection between cooperation and the construction of trust judgments. The second concerns the design of specific cooperative tasks that enable students to develop positive trust judgments about their partners. In climbing, this could consist of allowing students to test their partner's reliability in belay techniques during no-risk tasks (e.g. for the climber, let go of the holds and be lowered by the belayer from a low height). Such tasks would allow students to build indicators to access the reliability of the partner's skills and knowledge. The third consists of exploring how the teacher's interventions, including feedback to students, affect the transformation of students' trust judgments about their partners. This study shows that the teacher can indeed support and facilitate the cooperation between students by promoting the construction or the reinforcement of students' trust judgments of their partners. These results will need to be confirmed by other studies seeking to better understand the complex dynamic of trust in PE and to clarify the various dimensions involved in cooperation among PE students. Such studies would contribute to the development of a 'pedagogy of trust': a pedagogy that emphasizes that teachers can support and facilitate cooperation between students by promoting the construction or the reinforcement of students' trust in their partners.

References

- Amade-Escot, C. 2005. "The Critical Didactic Incidents as a Qualitative Method of Research to Analyze the Content Taught." *Journal of Teaching in Physical Education* 24: 127–148.
- Amade-Escot, C. 2006. "Student Learning within the Didactique Tradition." In *The Handbook of Physical Education*, edited by D. Kirk, D. Macdonald and M. O'Sullivan, 347–365. London: Sage.

- d'Arripe-Longueville, F., C. Gernigon, M. L. Huet, F. Winnykamen, and M. Cadopi. 2002. "Peer Assisted Learning in the Physical Activity Domain: Dyad Type and Gender Differences." *Journal of Sport & Exercise Psychology* 24: 219–238.
- Bourbousson, J., G. Poizat, J. Saury, and C. Sève. 2010. "Team Coordination in Basketball: Description of the Cognitive Connections among Teammates." *Journal of Applied Sport Psychology* 22 (2): 150–166.
- Butler, J. K. 1983. "Reciprocity of Trust Between Professionals and their Secretaries." *Psychological Reports* 53 (2): 411–416.
- Butler, S., and S. Hodge. 2001. "Enhancing Student Trust Through Peer Assessment in Physical Education." *Physical Educator* 58 (1): 30–39.
- Castelfranchi, C. 1998. "Modelling Social Action for Agents." *Artificial Intelligence* 103: 157–182.
- Cicourel, A. V. 1994. "La Connaissance Distribuée Dans le Diagnostic Médical." *Sociologie du travail* 36: 427–449.
- Deutsch, M. 1949. "A Theory of Co-operation and Competition." *Human Relation* 2: 129–152.
- Dyson, B. 2006. "Students' Perspectives of Physical Education." In *The Handbook of Physical Education*, edited by D. Kirk, D. Macdonald and M. O'Sullivan, 326–346. London: Sage.
- Dyson, B., and S. Grineski. 2001. "Using Cooperative Learning Structures in Physical Education." *JOPERD—The Journal of Physical Education, Recreation & Dance* 72 (2): 28–31.
- Ferrin, D. L., M. C. Bligh, and J. C. Kohles. 2007. "Can I Trust You to Trust Me?" *Group & Organization Management* 32 (4): 465–499.
- Guillou, J., and A. Durny. 2008. "Students' Situated Action in Physical Education: Analysis of Typical Concerns and their Relations with Mobilized Knowledge in Table Tennis." *Physical Education & Sport Pedagogy* 13 (2): 153–169.
- Hardin, R. 1999. "Do We Want Trust in Government?" *Democracy and Trust*, edited by M. E. Warren, 22–41. Cambridge, UK: Cambridge University Press.
- Hennings, J., T. Wallhead, and M. Byra. 2010. "A Didactic Analysis of Student Content Learning During the Reciprocal Style of Teaching." *Journal of Teaching in Physical Education* 29 (3): 225–243.
- Hoc, J.-M. 2001. "Toward a Cognitive Approach to Human-Machine Cooperation in Dynamic Situations." *International Journal of Human-Computer Studies* 54: 509–540.
- Huet, B., and J. Saury. 2011. "Ressources Distribuées et Interactions Entre Élèves au Sein d'un Groupe D'apprentissage: Une Étude de cas en Éducation Physique et Sportive [Distributed Resources and Students' Interactions in a Learning Group: A Case Study in Physical Education]." *eJRIEPS* 24: 4–28.
- Jefferson, G. 1984. "On Stepwise Transition from Talk about a Trouble to Inappropriately Next-Positioned Matters." In *Structures of Social Action: Studies in Conversation Analysis*, edited by J. Atkinson and J. Heritage, 191–222. Cambridge, UK: Cambridge University Press.
- Johnson, D. W., and R. T. Johnson. 2009. "An Educational Psychology Success Story: Social Interdependence Theory and Cooperative Learning." *Educational Researcher* 38 (5): 365–379.
- Jones, G. R., and J. M. George. 1998. "The Experience and Evolution of Trust: Implications for Cooperation and Teamwork." *Academy of Management Review* 23 (3): 531–546.
- Lafont, L., and F. Winnykamen. 1999. "Co-Operation and Competition in Children and Adolescents." In *Psychology for Physical Educators*, edited by Y. Vanden Auweele, F. Bakker, S. Biddle, M. Durand and R. Seiler, 379–404. Champaign, IL: Human Kinetics.
- McAllister, D. J. 1995. "Affect- and Cognition-Based Trust as Foundations for Interpersonal Cooperation in Organizations." *Academy of Management Journal* 38 (1): 24–59.
- National Physical Education Program for Middle Schools. 2008. Decree of July 8, 2008 laying down the National Physical Education Program for Middle Schools. *Official Bulletin-6*, 28 August 2008.
- Poizat, G., J. Bourbousson, J. Saury, and C. Sève. 2009. "Analysis of Contextual Information Sharing during Table Tennis Matches: An Empirical Study on Coordination in Sports." *International Journal of Sport and Exercise Psychology* 7 (4): 465–487.
- Poizat, G., C. Sève, G. Serres, and J. Saury. 2008. "Analyse du Partage D'informations Contextuelles dans Deux Formes D'interaction Sportives: Coopérative et Concurrentielle [Analysis of Contextual Information Sharing in Two Types of Sports Interaction: Cooperative and Competitive]." *Le Travail Humain* 71 (4): 323–357.
- Rovigno, I. 2006. "Situated Perspectives on Learning." In *The Handbook of Physical Education*, edited by D. Kirk, D. Macdonald and M. O'Sullivan, 262–274. London: Sage.

- Saury, J. 2008. "Transitions entre formes coopératives et concurrentielles de l'activité collective dans la prise de décision tactique au sein d'équipages experts en voile [Changes Between Cooperative and Competitive Types of the Collective Activity in the Tactical Decision-Making in Expert Sailing Crews]." In *Actes du Congrès 2007 de la Société Française de Psychologie*, edited by J. M. Hoc and Y. Corson, 177–185. Nantes: Editions French Society Psychology. <http://www.sfpsy.org/IMG/pdf/actes-SFP2007.pdf>.
- Sève, C., G. Poizat, J. Saury, and M. Durand. 2006. "A Grounded Theory of Elite Male Table Tennis Players' Activity During Matches." *The Sport Psychologist* 20: 58–73.
- Sheng, C. W., Y. F. Tian, and M. C. Chen. 2010. "Relationships among Teamwork Behavior, Trust, Perceived Team Support, and Team Commitment." *Social Behavior and Personality: An International Journal* 38 (10): 1297–1305.
- Sheppard, B. H., and M. Tuchinsky. 1996. "Micro-OB and the Network Organization." In *Trust in Organizations*, edited by R. M. Kramer and T. R. Tyler, 140–165. Thousand Oaks, CA: Sage.
- Sitkin, S. B., and N. L. Roth. 1993. "Explaining the Limited Effectiveness of Legalistic 'Remedies' for Trust/Distrust." *Organization Science* 4 (3): 367–392.
- Slavin, R. 1983. "When Does Cooperative Learning Increase Student Achievement?" *Psychological Bulletin* 94: 429–445.
- Theureau, J. 2004. *Le cours d'action: Méthode élémentaire [Course of Action: Elementary Methods]*. Toulouse, France: Octarès.
- Theureau, J. 2006. *Le cours d'action: Méthode développée [Course of Action: Developments in Methods]*. Toulouse, France: Octarès.
- Theureau, J., and F. Jeffroy. 1994. *Ergonomie des situations informatisées [Ergonomy in Situations Computer Use]*. Toulouse, France: Octarès.
- Tuomela, R., and M. Tuomela. 2005. "Cooperation and Trust in Group Context." *Mind & Society* 4 (1): 49–84.
- Ward, P., and M. A. Lee. 2005. "Peer-Assisted Learning in Physical Education: A Review of Theory and Research." *Journal of Teaching in Physical Education* 24 (3): 205–225.
- Weinberg, R. S., and D. Gould. 2010. *Foundations of Sport and Exercise Psychology*. Champaign, IL: Human Kinetics.