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4 **How stressors are dynamically appraised within a team during a game: An**
5 **exploratory study in basketball**

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1 **Abstract**

2 Little is known about how team sport athletes individually and collectively experience sources of
3 stress during competitive sport encounters. This study aimed to examine the nature of the
4 stressors team sport athletes appraised during games at individual and team levels, as well as their
5 degree of synchronization during an unfolding game. Through individual self-confrontation
6 interviews, the activities of nine basketball players of the same team were examined in detail. The
7 results revealed that twelve categories of stressors were reported, and categorized into two larger
8 units reflecting stressors perceived as affecting (i) “the team functioning as a whole” and (ii) “a
9 player’s own functioning”. Thus, the nature and degree of similarity of the game-specific
10 stressors experienced by basketball players within a single team were identified during a game. In
11 addition, the findings showed six different patterns of synchronizations of team members’
12 stressors, as well as their changes over the course of the game. They provided support for the
13 synchronized appraisal and experience of stressors within a team during a game. By adopting an
14 interpersonal perspective and examining the temporal interplay in team members’ activities, this
15 study shed light on stress within teams.

16
17 **Keywords:** stress, intrapersonal and interpersonal perspectives, team sports, team dynamics, team
18 functioning

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1 **1. Introduction**

2 Given the highly complex social environment surrounding competitive sport, stress
3 appears to be an inherent aspect of athletic performance (Fletcher, Hanton, Mellalieu, & Neil,
4 2012). Stress is a process that occurs as the result of a transaction, or reciprocal effects, between
5 athletes and their environment (Hoar, Crocker, Holt, & Tamminen, 2010; Lazarus, 2000).
6 Sources of stress within these transactions are called stressors and refer to demands that
7 individuals appraise as taxing or exceeding his or her resources (Hoar, Kowalski, Gaudreau, &
8 Crocker, 2006). There are numerous potential stressors in sport (e.g., Hoar et al., 2010) that are
9 often social in nature (Tamminen & Gaudreau, 2014). However, there is considerably less
10 research focusing on how stressors in team sports are individually and collectively appraised and
11 experienced during competitive sport encounters. Hence, the goal of this study was to: (a)
12 examine the nature of the stressors encountered by basketball team members during a game, (b)
13 explore the extent to which these stressors were similarly appraised and experienced, and (c)
14 explore the extent to which these stressors were simultaneously appraised and experienced during
15 an unfolding game.

16 Over the past couple of decades, sport psychology researchers have focused on identifying
17 and categorizing the different events or situations athletes appraise as stressors (e.g., Arnold &
18 Fletcher 2012; Fletcher et al., 2012; Noblet & Gifford, 2002; Scanlan, Stein, & Ravizza, 1991).
19 Recently, the meta-interpretation of Arnold and Fletcher (2012) synthesized the findings of 34
20 qualitative studies and provided a comprehensive taxonomy of 640 distinct organizational
21 stressors encountered by a large, wide-ranging cohort of athletes. They found four main
22 categories: leadership and personnel issues, cultural and team issues, logistical and environmental
23 issues, and performance and personal issues. Some of these studies focused specifically on team

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1 sports and identified specific stressors appraised by team sport athletes (e.g., Anshel & Wells,
2 2000; Holt & Dunn, 2004; Holt & Hogg, 2002; Madden, Summers, & Brown, 1990; Nicholls &
3 Polman, 2007; Nicholls, Holt, Polman, & Bloomfield, 2006; Nicholls, Backhouse, Polman, &
4 McKenna, 2009; Nicholls, Jones, Polman, & Borkoles, 2009; Noblet & Gifford, 2002; Reeves,
5 Nicholls, & McKenna, 2009). For example, Nicholls and Polman (2007) found that the most
6 salient stressors of under 18-year old international adolescent rugby union players were physical
7 errors, receiving coach/parental criticism, making a mental error, injury, and observing an
8 opponent play well. With a sample of basketball players, Anshel and Wells (2000) identified 25
9 sources of stress classified into five categories: interpersonal conflicts, refereeing decisions,
10 personal performance problems, opposition influences, and team behaviour. However, at present,
11 little is known about team sport athletes' communal appraisal and experience of these stressors in
12 specific sport situations (e.g., games). A key limitation of these studies is that stressors in team
13 sports have largely been explored from an individualistic or intrapersonal perspective focusing on
14 how each individual in a team appraises and experiences internal or/and external events as
15 stressors (Tamminen & Gaudreau, 2014). Furthermore, previous studies did not explore to what
16 extent the stressors individually appraised were also appraised and experienced by teammates at
17 the same or different times during specific sport situations. To our knowledge, the sport
18 psychology literature has failed to examine how team sport athletes individually and collectively
19 appraise and experience sources of stress during competitive sport encounters.

20 Although researchers have largely tended to focus on individual athletes' perceptions of
21 stressors (i.e., intrapersonal perspective), athletes' stressors are often social in nature and stem
22 from social interactions such as arguments or disagreements between teammates, being criticized
23 or yelled at by parents or coaches, getting a bad call by an official, and interpersonal performance

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1 or relationship conflicts (Arnold & Fletcher 2012; Tamminen & Gaudreau, 2014). The results of
2 Campo and colleagues' (2012) systematic review highlighted the importance of social influences
3 on team sport athletes' emotional experiences, as the influence of others (e.g., negative
4 relationships, criticism, teammates' behaviours) was identified as an antecedent of athletes'
5 negative emotions in over 58% of the studies they reviewed, whereas athletes' own errors (e.g.,
6 physical or mental errors) were reported as antecedents of negative emotions in 52.9% of the
7 studies reviewed. Team members may potentially influence the emotions or behaviours of
8 teammates through the conscious or unconscious induction of emotions, as reflected in the
9 phenomenon of emotional contagion (Hatfield, Cacioppo, & Rapson, 1994). Consequently, there
10 is a clear need to also explore how athletes' stressor appraisals influence and are influenced by
11 other team members during their common unfolding team activity and to what extent sources of
12 stress are shared by teammates during sport encounters (i.e., interpersonal perspective). As such,
13 an interpersonal perspective also considers how athletes appraise stressors as a group, reflecting
14 athletes' perceptions of how "we as a team are appraising events and situations" (Tamminen &
15 Gaudreau, 2014). Furthermore, stress occurs as a process that changes over time (Lazarus, 1999;
16 Nicholls et al., 2006, 2009). To achieve a more complete understanding of team sport athletes'
17 stressors, it seems necessary to consider the different stressors team sport athletes experience at
18 both individual and/or team levels and their temporal aspects.

19 Given the complex and dynamic nature of the relationship between athletes and their
20 environment (Lazarus, 2000), a focus on team sport athletes' perceptions of stressors also calls
21 for scrutinizing temporal aspects of the transaction. Although the way an individual athlete
22 experiences the team setting may be very distinct from the way it is experienced by his or her
23 teammates (Bourbousson, Poizat, Saury, & Sève, 2011), evidence of moment-to-moment

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1 contagion phenomena during a game have been provided in team sports (Bourbousson, Poizat,
2 Saury, & Sève, 2012; Bourbousson, R'Kiouak, & Eccles, 2015). In their study of the way in
3 which basketball players simultaneously understand the unfolding game, Bourbousson et al.
4 (2012) showed that temporal descriptions of individual courses of action and how these courses
5 of action interplay were heuristics for disentangling the way different interpretations of a given
6 event might lead to shared understanding later in the game. Moreover, the authors pointed out
7 that verbal communication was not needed to observe such contagion phenomena (Bourbousson
8 et al., 2011). Consequently, there is a clear need to consider that sources of stress occurring
9 during sport encounters are not similar and synchronized as a matter of principle, but that
10 temporal interplay between team members' activities might occur and lead to stressors being
11 shared by teammates to a greater or lesser extent. By adopting such a temporal view of the extent
12 to which stressors are simultaneously experienced within a team, the present study should also
13 contribute to the emerging science of team microdynamics (Bourbousson et al., 2015; Humphrey
14 & Aime, 2014; Li & Roe, 2012).

15 The present study aimed to address the lack of knowledge about how stressors in team
16 sports are individually and collectively appraised and experienced during competitive sport
17 encounters. Consequently, the nature of the stressors team sport athletes appraised during games
18 was explored at individual and team levels, as well as their degree of synchronization during an
19 unfolding game.

20 **2. Method**

21 *2.1. Participants*

22 Nine French male basketball players (mean \pm SD; age 17.11 ± 0.60 years; experience
23 playing competitive basketball 8.22 ± 0.97 years) volunteered to participate in this study. At the

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1 time of the study (November 2007), they were members of the same team, ranked number one in
2 the first division of the French Cadets Championship (i.e., the 16 best teams in the under-18
3 category). Pseudonyms were used for the athletes to ensure confidentiality. Chris, Jules and
4 Bertrand were guards, Guy and Bastien were small forwards, Vic and Vince were power
5 forwards, and Noé and Niels were centres. The participants' parents all signed statements of
6 consent and were informed of the athletes' right to withdraw at any time. The present study
7 obtained approval from the local University of Nantes (France) review board regarding standard
8 research practice and the guidelines outlined for research involving humans.

9 *2.2. Data collection*

10 The team members' activity was studied during an entire competitive match. The team
11 won the match in question easily (final score: 74-58), as well as the previous encounter two
12 months earlier (by a 25-point margin). Two types of data were collected: (a) continuous audio-
13 video recordings of the players' activities during the entire match and (b) verbalizations during
14 post-match interviews.

15 During the match, recordings were made with the audio-video camera positioned behind
16 and to the side of the court. A wide-angle lens filmed all players and their opponents
17 continuously. The angle was constantly adapted to follow the players' movements on-court and
18 to include the four other players waiting on the sideline as much as possible.

19 The verbalization data were gathered from individual self-confrontation interviews with
20 each of the players as soon as possible after the matches (between 24 and 48 hours post-match)
21 (see Bourbousson et al., 2011, 2012, 2015 for scientific accounts obtained using this interview
22 procedure). During the interviews, each player viewed the audio-videotape of the match together
23 with the researcher. The player was asked to describe and comment on his activity during the

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1 match (what he was doing, feeling, thinking and perceiving during the match). Prompts from the
2 interviewer were designed to obtain complementary information about the actions that were
3 meaningful to the player (e.g., “Here, you’re saying that you’re waiting for Chris to call the
4 play...?”). Probing questions were used to explore participants’ feelings in detail. Nevertheless,
5 questions did not address the potential stressors directly, in order not to influence the players’
6 expression of their feelings. Each of the players commented on the entire match. The interviews
7 lasted an average of 75 minutes and were all recorded in their entirety using a camera and tape
8 recorder.

9 *2.3. Data processing*

10 The audio-videotapes were viewed in order to draw up an inventory of the nine players’
11 moves. The verbal exchanges between player and researcher during the interview were recorded
12 and fully transcribed. The data were then processed in four steps (see Theureau, 2003 for details
13 of the experiential data analysis): (a) generating a log of the match, (b) reconstructing the way
14 individual players experienced the dynamics of the game, (c) synchronizing the way individual
15 players experienced the dynamics of the game, and (d) identifying what stressed the players, and
16 characterizing the extent to which these stressors were similarly and simultaneously experienced
17 by team members over the course of the match.

18 a. Generating match logs

19 This step consisted of generating a summary table or log containing the data collected for
20 the match. The data were presented by mapping two levels of data to each other. The first level
21 pertained to the data recorded during the match (i.e., descriptions of a player’s observable moves
22 and overt communications). The second level pertained to the data recorded during the post-
23 match interview (i.e., verbatim transcription of the prompted verbalizations).

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1 b. Reconstructing the way individual players experienced the dynamics of the game

2 We first identified discrete meaningful units of activity that constituted the chain of events
3 meaningful to each participant (Theureau, 2003). Each unit had personal meaning and was
4 assumed to be the expression of the way in which the activity was experienced by the given
5 participant at a given instant. The way these units link together over time accounts for the
6 dynamics of a given player's experience of the game. During the period of the game under study,
7 249 discrete units of activity were identified for Chris's courses of action, 429 units for Jules's,
8 259 for Bertrand's, 224 for Guy's, 185 for Bastien's, 197 for Vic's, 243 for Vince's, 269 for
9 Noé's, and 321 for Niels's.

10 c. Synchronizing the way individual players experienced the dynamics of the game

11 In this step, we synchronized the nine ways individual players experienced the dynamics
12 of the game by presenting them side-by-side in the same table in chronological order. To
13 facilitate synchronization of the individual meaningful units, the objective description of the
14 unfolding match was used to provide the ball holder's name, the timing of the players' actions,
15 and the players' positions on the court. The synchronization of the ways in which individual
16 players experienced their activity respectively at a given moment of the game is illustrated in
17 Table 1.

18 d. Identification of sources of stress and the extent to which they are simultaneously
19 experienced within the team

20 This analysis comprised three steps: (a) identification of the individual stressors, (b)
21 thematic analysis of these stressors, and (c) characterization of the extent to which these stressors
22 were simultaneously experienced within the team over the course of the game.

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1 The first step in this analysis identified the individual sources of stress (i.e., an event
2 [demand, problem, difficulty] appraised and experienced as unpleasant, upsetting or perturbing
3 an athlete's current activity within the team during the game, Anshel & Wells, 2000; Hoar et al.,
4 2006). The stressors were identified as they appeared in the units of activity forming the way
5 individual players experienced the dynamics of the game. At this stage in the processing,
6 stressors were labelled according to the experience that the given participant cited. We identified
7 790 stressors experienced within the team over the course of the game.

8 The second step was to perform a thematic analysis (Braun & Clark, 2006) of the contents
9 of the stressors identified at the first step. This processing consisted in searching for patterns (i.e.,
10 commonly recurring themes) in the qualitative data set. Using a thematic analysis, the contents of
11 the stressors were grouped into larger units on the basis of two criteria: (a) the meaning of the
12 statements, and (b) the use of category definitions that were discriminating enough to avoid
13 overlapping. The categories were defined step-by-step and re-checked each time a new category
14 was created. For the 790 experienced stressors, this resulted in 12 categories, which then fitted
15 into two overarching themes. An analysis of the occurrences of these themes was then performed,
16 enabling the most prominent themes, and indicating which players experienced which particular
17 stressors. Subsequently, this analysis enabled identification of the types of stressors most
18 commonly shared by the players.

19 In the final step, we characterized the extent to which these sources of stress were
20 simultaneously experienced over the course of the game. For this, each type of stressor was
21 positioned accurately on the timeline of the activity of each individual player. A comprehensive
22 inspection of the synchrony of these occurrences resulted in the characterization of typical forms

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1 of collective arrangement of the stressors at a given instant (i.e., the way in which stressors occur
2 at team level at a given moment).

3 **3. Results**

4 *3.1. Identification of the types of stressors and their similarity across team members*

5 From the description of the activity at the level that was meaningful for the players,
6 analysis of the elements that stressed the players during this basketball match identified 790
7 events. Thematic analysis of the contents of these experienced stressful events revealed 12
8 categories of stressors (see Table 2). This analysis further revealed that the 12 categories of
9 stressors fit within two overarching themes, namely: (a) stressors perceived as affecting the team
10 functioning as a whole ($n = 522$, 66%), and (b) stressors perceived as only affecting a player's
11 own functioning ($n = 268$, 34%). The breakdown of the stressors across the various categories for
12 each team member is presented in Table 2. The following sections detail the players' subjective
13 experiences under the two main overarching themes.

14 a. Stressors perceived as affecting the team functioning as a whole

15 This theme comprised the following types of stressful events: a team member considering that
16 the unfolding game events were potentially detrimental to the team performance during the game
17 (e.g., the level of performance of each of the constitutive team members, the level of play of the
18 opposing team, the current score, as well as external factors that could perturb the team
19 functioning, such as refereeing quality). To illustrate this theme, the following excerpts from the
20 self-confrontation interviews relate to a team member's experience during the game: "Bertrand
21 [my teammate] asked us to develop the same tactical move as before...I was afraid that the
22 opponents would be able to predict our moves and our positioning. He [Bertrand] has to stop
23 calling this tactical play" (Jules, 13'30'', coded A-1: Stressed by the *Level of performance of a*

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1 *team member*), and “I was lost during this defence sequence. I didn’t understand what they were
2 doing: my direct opponent hadn’t balanced the space, he stayed at the 3-point line and the ball
3 had been thrown to the other side of the court. I was trapped and don’t understand how... such a
4 setting mustn’t happen again” (Chris, 2’05’, coded A-4: Stressed by the *Tactical difficulty level*
5 *presented by the opposition*).

6 b. Stressors perceived as only affecting a player’s own functioning

7 This theme comprised the following type of stressful events: a given team member considered
8 that the unfolding game events were potentially detrimental to his individual performance during
9 the game. These events were of a physical or psychological nature. Physical events included pain
10 or fatigue, while social demands or mental error were psychological. External events like
11 criticism from the coach, or the opposite team changing its collective organization, were also
12 stressors able to affect the individual functioning of the team member in question. To illustrate
13 this theme, the following excerpts from the self-confrontation interviews relate to a team
14 member’s experience during the game: “I was wrong to put pressure on my direct opponent, and
15 so I made a mistake in my technique, which led to the referee signalling a foul. I needed to find a
16 solution” (Guy, 18’40, coded B-1: Stressed by *Personal performance problems*), and “I lost the
17 thread of our team organization. I felt like I was like dreaming at that point. I couldn’t remember
18 all the instructions I had to follow. I’ll have to be more focused. Here I asked the assistant coach
19 to remind me of the team instructions that were given during the time-out” (Niels, 13’12, coded
20 B-2: Stressed by *Mental errors*).

21 3.2. Time synchronization of the types of stressors within the team

22 Temporal analysis of the previous descriptions of the stressors experienced within the
23 game revealed several forms of synchronization of stressors at a given instant within the team,

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1 known as characteristic collective arrangements of stressors. Six characteristic arrangements were
2 observed, namely: (a) a player made an error and this error was sufficiently serious to be
3 simultaneously a common source of stress for him and his teammates; (b) a player made an error
4 sufficiently serious to be a common source of stress for his teammates, without his being
5 concerned himself; (c) an external event was a common source of stress (e.g., referee, opposing
6 coach); (d) several players were simultaneously concerned by personal performance problems;
7 (e) several players were simultaneously concerned by the level of team performance as a source
8 of stress; (f) several players were simultaneously concerned by the level of opposing team
9 performance as a source of stress. Figure 1 illustrates these characteristic forms of arrangement of
10 the sources of stress within the team. These forms changed across time, fluctuating frequently so
11 that no specific temporal pattern was visible in the way the arrangements were linked together
12 from one moment to the next. Figure 2 illustrates the changes in the forms of collective
13 arrangements of stressors across time during a portion of the game.

14 **4. Discussion**

15 Using individual experience data collection, the purpose of this study was threefold: (a) to
16 examine the nature of the stressors encountered by team members, (b) to explore the extent to
17 which these stressors were similarly experienced, and (c) to explore the extent to which these
18 stressors were simultaneously experienced during an unfolding game. The findings provided
19 some support for Tamminen and Gaudreau's (2014) research perspectives on stress within teams.

20 Firstly, results highlighted that basketball players experienced a multitude of stressors
21 during a game. Twelve categories were reported and categorized into two larger units reflecting
22 stressors perceived as affecting: (a) "the team functioning as a whole" (e.g., level of performance
23 of a team member, level of performance of opponents, external factors) and (b) "a player's own

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1 functioning” (e.g., personal performance problems, mental errors, coach’s criticism). Similar
2 stressors in competitive sport have been reported in previous studies (e.g., teammates’ behaviours
3 and interactions, the coach’s personality and attitude, performance feedback, refereeing
4 decisions, errors relating to one’s own performance) (Anshel & Wells, 2000; for review see
5 Arnold & Fletcher, 2012; Madden et al. 1990). For example, in Anshel and Wells’s (2000) study,
6 the most intense sources of stress reported by basketball players related to refereeing decisions
7 and personal performance problems. As a whole, previous studies have explored stressors in team
8 sports from an individualistic perspective and have failed to take into account the interpersonal
9 nature of sources of stress perceived as affecting team functioning. The originality of our results
10 stems from the identification of stressors appraised as affecting both individual and team
11 functioning. In addition, the present study has added to the literature by providing an original
12 focus on game-specific stressors appraised during a real game by members of one team (e.g.,
13 events during the game, tactical difficulty of opposition, ratio of power) and specifically
14 highlighted stressors related to team functioning during a game (e.g., collective demotivation,
15 score management, level of performance of opponents). To our knowledge, previous studies have
16 generally explored stressors in team sports over long periods, such as during preparation for
17 competition (e.g., Holt & Hogg, 2002), or a season (e.g., Holt & Dunn, 2004; Nicholls et al.,
18 2006). To date, few studies have focused on stressors experienced during an unfolding game
19 (with the exception of Anshel & Wells, 2000) and particularly within a single team. The
20 methodological approach used in this study (i.e., video recall method) allowed exploration of
21 game-specific stressors appraised and experienced by members within one team in as close to
22 “real time” as possible. Video recall would seem to be a viable method to improve retrospective
23 recall validity (Bourbousson et al., 2012; Evans, Hoar, Gebotys, & Marchesin, 2014; Gilbert,

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1 Trudel, & Haughian, 1999). Nevertheless, a more comprehensive understanding of stressors
2 appraised as affecting both individual and team functioning is needed. Future research examining
3 interpersonal aspects of stress could also consider stressors experienced outside of games that
4 impinge on team functioning and performance during the game (e.g., organizational stressors,
5 conflict).

6 Furthermore, this study explored the extent to which the stressors appraised by one player
7 were also similarly appraised by teammates at the same or a different time during the game. The
8 results showed that teammates similarly reported one-third of stressors perceived as affecting a
9 player's own functioning (i.e., 34%) and two-thirds of stressors perceived as affecting the team
10 functioning as a whole (i.e., 66%). The most commonly shared category of stressors concerning
11 the athlete's own functioning consisted of "personal performance problems", and for team
12 functioning consisted of "teammates' performance problems". However, results for two athletes
13 did not follow this pattern. They reported one-half of the sources of stress related to their own
14 functioning (e.g., 44.5%) and one-half related to team functioning (e.g., 55.5%). The ratio
15 between these two categories of stressors appeared different to that of other team members. This
16 may reflect the fact that these two athletes seemed more preoccupied and perceived more sources
17 of stress related to their own functioning than other teammates did (e.g., personal performance
18 problems, mental errors, social evaluation, etc.). These players may also be viewed as a potential
19 source of stress for their teammates (e.g., "teammates' performance problems") (see Figure 1).
20 They may have influenced the emotions or behaviours of their teammates through the conscious
21 or unconscious induction of emotions (Hatfield et al., 1994; Moll, Jordet, & Pepping, 2010).
22 Further, in the future it could be interesting to examine whether other variables may explain the
23 stress profile of these players, such as play experience, role and responsibility in the team or

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1 personality (Driskell, Goodwin, Salas, & O'Shea, 2006). In general, future research could also
2 investigate potential variables such as team cohesion, team efficacy, coping styles, and
3 leadership, in order to provide a deeper understanding of stress experience within teams at both
4 individual- and collective-levels.

5 In addition to the individualistic or intrapersonal perspective, these results extended
6 previous studies conducted in team sports (e.g., Anshel & Wells, 2000; Holt & Dunn, 2004; Holt
7 & Hogg, 2002; Madden et al., 1990; Nicholls & Polman, 2007; Nicholls et al., 2006, 2009,
8 Noblet & Gifford, 2002; Reeves et al., 2009) and provided information regarding the degree of
9 similarity of sources of stress appraised within a single team during a game. They showed that
10 team sport athletes seem to share and experience similar and common game-specific stressors.
11 The results provided empirical support to research calls to investigate how stressors are appraised
12 as a team and how athletes' shared appraisals may be congruent or incongruent from their
13 teammates' appraisals (Crocker, Tamminen, & Gaudreau, 2015). To our knowledge, the present
14 study is the first to adopt an interpersonal perspective to examine the appraisal and experience of
15 stressors at collective level within a single team during a game (Tamminen & Gaudreau, 2014).
16 Communal stressors have been defined as: "when one or more individuals perceives a stressor as
17 "our" problem (a social appraisal") vs. "my" or "your" problem (an individualistic appraisal)"
18 (Lyons et al., 1998, p. 583). The present study provides empirical support for such a statement.
19 Moreover, our results highlight how such communal stressors are arranged together within the
20 team to generate team-level configurations of stress.

21 In addition to identification of the nature and degree of similarity of the game-specific
22 stressors experienced by basketball players, it seems interesting to identify the period of time
23 during the game when teammates are affected by the same types of stressors. Based on a

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1 transactional perspective (Lazarus, 1999), stress is viewed as an ongoing dynamic process that
2 involves the individual transacting with his or her environment, appraising the situation.
3 Consequently, exploring stressors appraised by athletes during a game needs to take into account
4 temporal interplay in team members' activities. As such, the temporal view adopted in this study
5 has also allowed tracking of the way in which stressors were simultaneously experienced within
6 the team by a majority of team members during the game. The results showed different patterns
7 of synchronization within the team during the game (see Figure 2). The most frequent
8 synchronizations of team members' stressors were: (a) a player made an error and this error was
9 sufficiently serious to be simultaneously a common source of stress for him and his teammates;
10 (b) a player made an error sufficiently serious to be a common source of stress for his teammates
11 without his being concerned himself; (c) an external event was a common source of stress (e.g.,
12 referee, opposing coach); (d) several players were simultaneously concerned by personal
13 performance problems; (e) several players were simultaneously concerned by the level of team
14 performance as a source of stress; (f) several players were simultaneously concerned by the level
15 of opposing team performance as a source of stress. These findings highlighted that a stressor
16 appraised at individual level by one player may also be appraised at the same time during the
17 game by other team members (team level). These results provided additional evidence of
18 moment-to-moment stress contagion phenomena and the temporal shared appraisal and
19 experience of stressors within the team (Bourbousson et al., 2012, 2015; Hatfield et al., 1994). As
20 Vallerand and Blanchard (2000) point out, athletes' stressors may have potential consequences
21 for interpersonal appraisal and behaviours within the team. By examining the temporal interplay
22 in team members' activities, this is the first study to provide support for the synchronized
23 appraisal and experience of stressors within a team during a game. Overall, these findings invite

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1 future research to consider that phenomena of cognitive or/and emotional entrainment underlie
2 the way in which individual activities are experienced when participants are co-located members
3 of a team and share a common goal (Bourbousson et al., 2012, 2015).

4 Despite the strengths of this study, some limitations warrant mention. Firstly, the small
5 sample prevents direct generalization to other team sports, although we suspect the results
6 reported here may generalize to other similar groups and teams and present a point of departure
7 for exploring interpersonal stress and coping processes in team sports. Future research could try
8 to replicate these findings with a more comprehensive sample of basketball players at different
9 levels of expertise and/or other sport teams. Secondly, the findings should be interpreted with
10 caution because the match analysed was won (74-58 points). The results need to be supplemented
11 with other game scenarios (e.g., games that are lost or drawn) at different levels of competition to
12 gain a better understanding of the dynamics of the interpersonal processes of stress and coping.
13 Game scenarios and levels of competition are thought to place specific demands and constraints
14 on athletes and teams that could influence appraisal and coping processes at individual and team
15 levels. Future research needs to explore the characteristics of situational demands that lead to
16 communal stressors and coping strategies within teams. Finally, this study adopted a
17 conceptualization of stressors experienced within a team at two levels (individual and team), and
18 did not take into account the characteristics of the stressor, such as controllability, predictability
19 and chronicity. It would be valuable to consider the distinctive characteristics of the stressor and
20 how individual athletes vs. teams appraise and ultimately cope with stressors.

21 **5. Perspectives**

22 Given that team sports are played in highly competitive and demanding environments,
23 under conditions of extreme uncertainty, this study provided a unique insight into stress within

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1 the team sport setting. From both theoretical and applied perspectives, these findings highlighted
2 the importance for researchers and practitioners to improve understanding of the overall stress
3 experience of athletes within a team in order to develop action at both individual and team levels.
4 Sport psychologists may wish to prepare team sport athletes for the variety of demands that they
5 may face in the game environment. In addition, they may need to focus on teaching athletes
6 individual and communal effective coping strategies in order to avoid the risk of stress contagion
7 or choking under pressure (Gómez, Lorenzo, Jiménez, Navarro, & Sampaio, 2015). Social skills
8 appear to be an important asset and resource to assist adaptation in the face of stress (Clarke,
9 2006). Future research needs to focus on a more holistic approach, taking into account team
10 members' sources of stress and coping responses at both individual- and collective-levels, in
11 order to improve understanding of how athletes interact within the social context of a team and to
12 develop action to improve individual and communal coping and emotional regulation (Tamminen
13 & Gaudreau, 2014).

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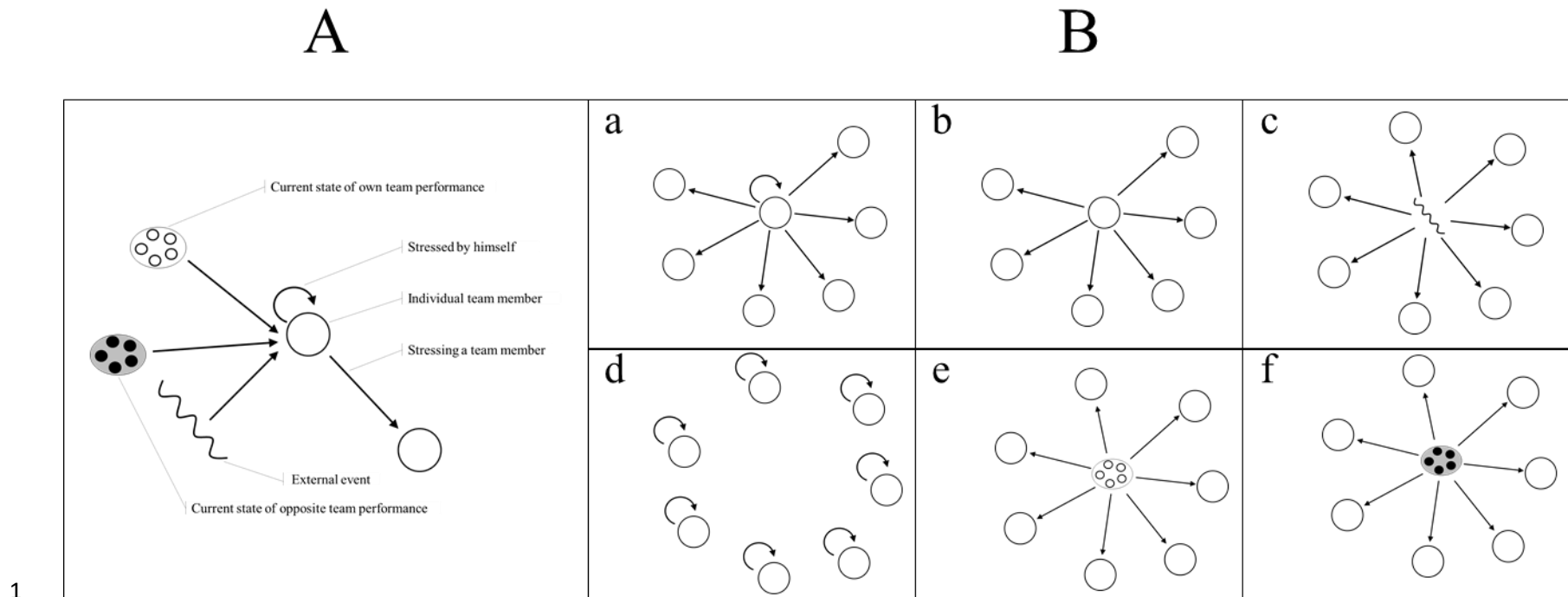
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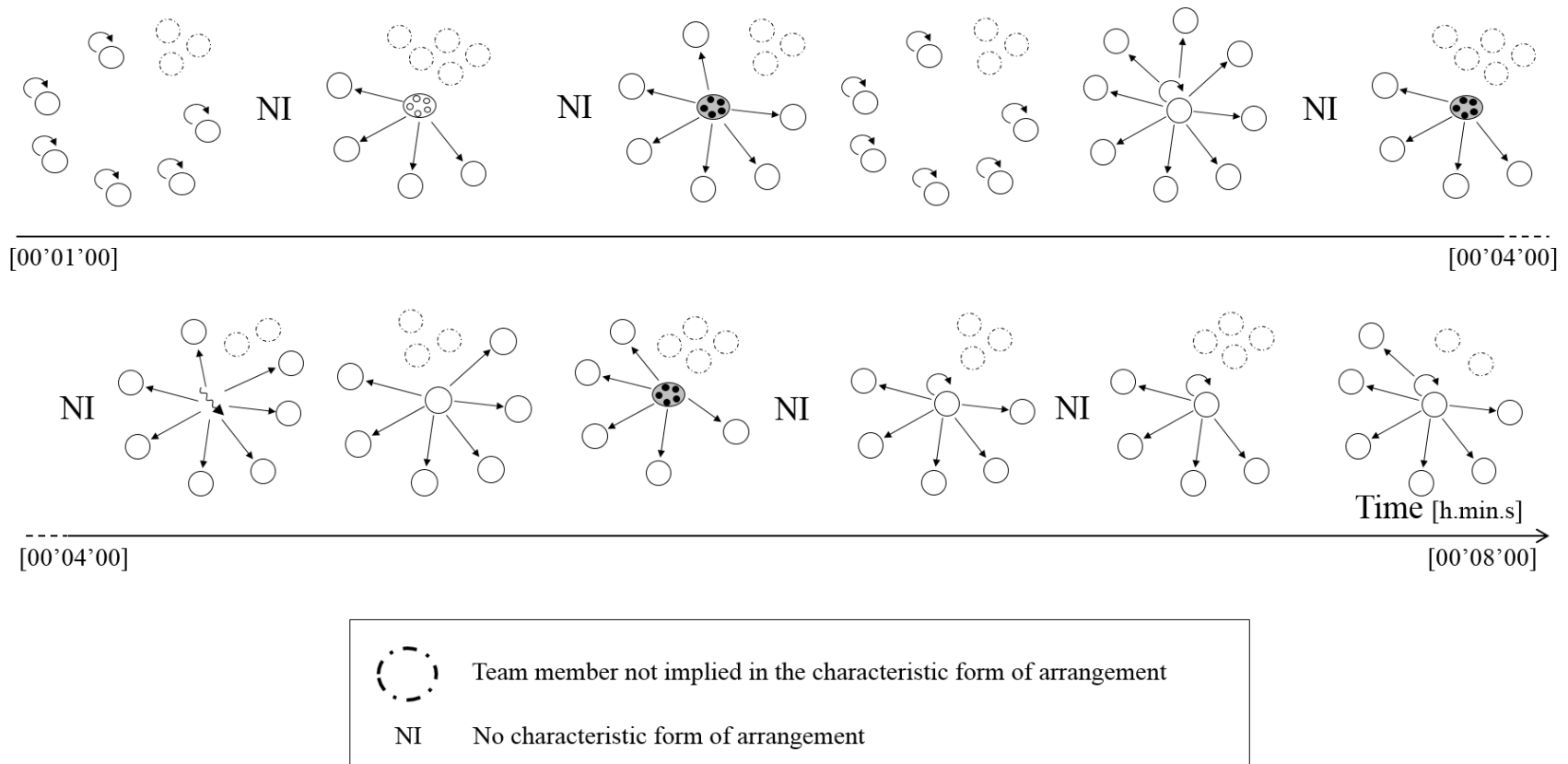
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1
2 *Figure 1.* Characteristic forms of arrangement of the sources of stress within a team. A- Nomenclature of all possible types of
3 arrangements of stressors within a team. B- Characteristic forms of arrangement of stressors at a given instant within a team: (a) one
4 player makes an error and this error is important enough to be simultaneously a common source of stress for him and his teammates;
5 (b) one player makes an error important enough to be a common source of stress for his teammates without being concerned himself;
6 (c) an external event appears as a common source of stress for the team members simultaneously (e.g., referee, coach of opposite team,
7 slippery floor, etc.); (d) several players are simultaneously experiencing personal sources of stress (e.g., individual performance
8 problems); (e) several players are simultaneously experiencing the current level of team performance as a source of stress; (f) several
9 players are simultaneously experiencing the current level of opposite team performance as a source of stress.

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1
 2 *Figure 2.* Changes in the forms of collective arrangements of stressors across time during a portion of the game
 3

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1 Table 1

2 *Illustration of the Synchronization of the Nine Players' Meaningful Units at a Given Moment of the Game*

Extrinsic description	Units of activity for Jules	Units of activity for Chris	Units of activity for Guy	Units of activity for Bertrand	Units of activity for Bastien	Units of activity for Noé	Units of activity for Niels	Units of activity for Vince	Units of activity for Vic
	Unit 25: defending my player by keeping an eye on the game	Unit 35: defending my zone by monitoring Noé's defence	Unit 30: watching the game unfold	Unit 22: trying to be in a good position for a slam dunk	Unit 22: observing the qualities of the game	Unit 23: defending effectively	Unit 22: trying to recover physically	Unit 24: watching the game	Unit 31: defending the zone
<p>The opposing centre gets the ball and Noé plays man-to-man defence</p> <p>Noé gets overwhelmed, then catches up with his opponent and blocks him</p> <p><i>(On the sidelines: Guy, Bastien, Niels, Vince)</i></p>	<p>Here I have to be good in defence... the ball has been passed to the opposing centre, I'm monitoring my player while I keep an eye on the game... Noé's opponent does a reverse. Noé is starting to lose it...but he manages to come back and block the shot. I tell myself that Noé has done a pretty good job, the opposing centre handled things badly, he tried to pull a fake even though it would have been quicker to shoot, that's why Noé was able to get back on top of things and, right when his opponent was going to shoot, he was able to block it. But usually, here, Noé is supposed to take 2 points, because he fell for it, and it's rare when he recovers from his mistakes ...</p>	<p>I'm now defending the zone here...I check my player and the nearest opponents. I say to myself that we might perform a fast play at the next attack, it would be good at this stage of the match. I see that Noé is blocking the opposing centre. You know, it wasn't easy to do this block, Noé was overwhelmed. I say to myself that Noé's defence is good today.</p>	<p>Here I'm just watching the game, I want to observe what will happen. I can guess that the rhythm will be a little slow down on the next attack. I can see that Noé has guarded the opposing centre well and that he's blocked him. It's well done.</p>	<p>Noé gets hold of the ball. I see that we are in a good position for a counter-attack, and in general, when you suddenly get hold of the ball, you can carry out a counter-attack. I say to myself that if this is the case, I might be able to perform a slam dunk, that's why I begin to run here.</p>	<p>While I'm on the bench, the information gathered on the game and opponents helps me to be better for the next match. That's why I am bothered there by the coach that's in front of me, I can't see the game. I wanted to watch the defence.</p>	<p>In general, when there's a real size difference between two players, it's harder for the referee. That's why I made a small foul here that wasn't called. That way I can guard my opponent by keeping close to him.</p>	<p>The unfolding game now allows us to make a break. I try to recover physically. I can guess that the opponent won't get a basket now, because I can see the opposing centre, and he's not very good near the circle. And Noé is defending well. He blocks the basket. I was really watching the game here.</p>	<p>Here, I'm watching the game unfold. I can see the tall opponent who tries to shoot and Noé blocks him.</p>	<p>The coach is going to remind me about forgetting. In the defence zone, I have to be in a very specific position and I sometimes forget that. Here, Noé gets me to reposition myself on the side, and I do it, of course. I want to defend the zone.</p>

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1 Table 2

2 *Frequency and intraclass percentage of stressors perceived by team members during a game*

Stressors	Chris		Bertrand		Bastien		Jules		Guy		Noé		Vic		Niels		Vince		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
A- Stressors perceived as affecting the team functioning as whole	45	69	52	62	47	70	109	76	42	66	74	67	30	54	76	65	50	57	522	66
<i>A-1. Level of performance of a team member</i>	17	38	26	50	28	60	68	62	23	55	39	53	12	40	28	38	24	48	265	51
<i>A-2. External factors perturbing team functioning (referee, opposing coach)</i>	7	16	5	10	1	2	14	13	1	2	13	18	6	20	12	16	8	16	67	13
<i>A-3. Engagement and performance level of the team (score management, collective demotivation)</i>	6	13	11	21	2	4	10	9	3	7	9	12	4	13	7	10	5	10	57	11
<i>A-4. Tactical difficulty level presented by the opposition</i>	8	18	4	8	5	11	8	7	5	12	4	5	1	3	6	8	5	10	46	9
<i>A-5. Level of performance of opponents (individual players, luck)</i>	6	13	5	10	9	19	4	4	7	17	3	4	2	7	6	8	3	6	45	9
<i>A-6. Ratio of power</i>	1	2	1	2	2	4	5	5	3	7	6	8	5	17	14	19	5	10	42	8
B- Stressors perceived as affecting a player's own functioning	20	31	32	38	20	30	35	24	22	34	37	33	26	46	39	35	37	43	268	34
<i>B-1. Personal performance problems</i>	6	30	15	47	8	40	10	29	7	32	15	41	17	65	21	54	14	38	113	42
<i>B-2. Mental errors (concentration, negative emotions)</i>	4	20	3	9	4	20	9	26	4	18	5	14	3	12	5	13	9	24	46	17
<i>B-3. Social demands (from teammates, perception of coach's satisfaction, proving your worth)</i>	1	5	8	25	1	5	4	11	4	18	8	22	2	8	6	15	8	22	42	16
<i>B-4. Personal unfavourable game events (opposition, collective organization, score, slippery floor)</i>	4	20	4	13	6	30	4	11	4	18	5	14	1	4	2	5	3	8	33	12
<i>B-5. Physical demands (pain, fatigue)</i>	5	25	2	6	1	5	8	23	3	14	2	5	2	8	2	5	1	3	26	10
<i>B-6. Coach criticism</i>	0	0	0	0	0	0	0	0	0	0	2	5	1	4	3	8	2	5	8	3

3