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One for All and All for One: Relating Team Cohesion to the Precompetitive Emotional Response

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Declaration according to § 7 section 2 numbers 4 and 5:

Hereby I attest: I prepared this thesis independently and by using the referred sources and technical aids only; it has not yet been presented for examination elsewhere. Parts, single sentences, or phrases that have been adopted verbatim are identified as direct quotations.
Hereby I declare, that I adhered to the German Sport University Cologne's guidelines of proper scientific conduct.

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Hierdurch erkläre ich, dass ich die "Leitlinien guter wissenschaftlicher Praxis" der Deutschen Sporthochschule Köln eingehalten habe.

01.09.2014

Svenja A. Wolf

I define [...] happiness as making reasonable progress toward the realization of a goal.

Richard Lazarus, 1999

In the clearing stands a boxer, and a fighter by his trade. And he carries the reminders of ev'ry glove that laid him down or cut him till he cried out in his anger and his shame, "I am leaving, I am leaving." But the fighter still remains.

Paul Simon, 1968

Although I initially stated that I prepared this thesis independently, I would never have completed it without your encouragement, help, and support. This, I sincerely appreciate and for this, I am eternally grateful. Without you not this dissertation but I would have been finished.

Trotz meiner Versicherung zu Anfang, dass ich diese Arbeit selbstständig angefertigt habe hätte ich sie niemals fertig stellen können ohne eure Ermunterung, Unterstützung und Hilfe. Diese weiß ich wirklich zu schätzen und für diese bin ich ewig dankbar. Ohne euch wäre nicht diese Dissertation sondern ich am Ende gewesen.

support | səˈpôrt |
noun

1 a thing that bears the weight of something or keeps it upright.
the action or state of bearing the weight of something or someone or of being so supported.
2 material assistance.
comfort and emotional help offered to someone in distress.
approval and encouragement.

(New Oxford American Dictionary, 2012)

Für Mami, Papi, Claudia und Omi. Ich weiß ihr gebt alles und wenn ihr könntet noch mehr. Ich habe euch wahnsinnig lieb. Für Lynni, Claudia, Thilo, Bodo und Melanie. Für euer Interesse und eure Ermutigung, die ganze lange Zeit. Und für Manuel. Für Birte und Eva, Jule, Janine, Mareike, Tine, Lisa, Cati, Verena, Tini M. Für eure Geduld, eure immerwährende Ermutigung und tatkräftige Unterstützung, eure offenen Ohren und Arme. Danke. Für Katharina, dass Du im Endspurt auf Abruf und Anruf bereit warst. Für Sebastian, dass Du sowohl Deine Wohnung als auch Deine Expertise ganz selbstverständlich mit mir geteilt hast. Für Katja, dass Du meine Dissertation hast mit einziehen lassen. Für Meagan, Katrin, Maike, Tini H., Kirsten, Steph und Anna. For Blair and Eryn, Mark, Alex – my lab family (no, not the dogs...). Being able to work with you was and still is a Great Deal of Luck. Für Sara, Inga, Franzi, Nina, Martin und Helen, partners in crime and pain. Pour Sylvain, ami et expert en même temps. Für Kathrin, Amelie, und Lindsay. Was wir haben, das haben wir. Für Alice und den Rest der Abteilung (ähm, ich hätte da noch eine kurze Frage...). For Pam and helping me figure out multilevel analysis really is just regression. For Mark. Thank you for the time, expertise, and effort you invested in me and this dissertation. Thank you for all the support and opportunities you provided. Thank you for making a huge difference. You were not obliged to any of this, therefore, I am all the more. Für Jens. Danke für Deine inhaltlichen Beiträge und Ratschläge, für das Aufzeigen von Schwachstellen und Deine vielfältige Unterstützung, besonders bei meinen spontaneren Anliegen. Durch Dich ist diese Arbeit erst möglich und letztendlich eine bessere geworden.

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1. Abstract and Keywords

In my dissertation, I aimed to explain how team cohesion relates to athletes' emotional response to a pending competition. To this end, I conducted two correlational field-studies in which female and male competitive interactive sport athletes completed self-report measures prior to an in-season game. My analyses of these studies demonstrated (a) the relative importance of cohesion (i.e., social Individual Attractions to the Group) to athletes' precompetitive anxiety response when compared to other selected predictors; (b) the initial validity of a novel measure of precompetitive appraisal as the determinant of athletes' precompetitive emotional response; (c) that higher cohesion (i.e., task cohesion and Individual Attractions to the Group) predicted a precompetitive appraisal of higher personal importance of a pending team competition and more positive prospects for coping with competitive demands, respectively; (d) that higher team-identification and greater perceived outcome interdependence mediated the links from cohesion (i.e., task-related Group Integration) to competition importance. The relationships between cohesion and appraisal were the same for all teams, but teams differed in their average competition importance. In sum, my findings indicate that cohesion-building could enhance performance because more positive prospects for coping would entail a more pleasant tone and more facilitative interpretations of precompetitive emotion symptoms and higher competition importance would entail greater motivational force, both of which generally benefit performance. However, coaches and consultants in technically and/or tactically demanding sports should be cautious with regard to cohesion-building because higher competition importance also entails increased emotional intensity, which could harm performance on such tasks.

Keywords: cognitive appraisal, precompetitive anxiety, team-identification, perceived interdependence, motivational force

Zusammenfassung und Schlüsselwörter

Ziel meiner Dissertation war zu erklären, inwiefern der Zusammenhalt einer Mannschaft mit dem emotionalen Vorstartzustand ihrer Mitglieder in Beziehung steht. Zu diesem Zweck habe ich zwei korrelative Feldstudien durchgeführt in welchen Leistungssportlerinnen und -sportler interaktiver Mannschaften vor einem Saisonspiel Selbstberichts-Fragebögen ausgefüllt haben. Die Auswertung dieser Studien zeigte (a) die relative Wichtigkeit von Mannschaftszusammenhalt (d.h., soziale Gruppenattraktivität) bezüglich der Vorstartangst-Rektion der Sportlerinnen und Sportler im Vergleich zu anderen ausgewählten Prädiktoren; (b) die vorläufige Validität eines neuen Kurzfragebogens zur Erfassung der kognitiven Bewertung der Vorstartsituation als der Determinanten des emotionalen Vorstartzustands; (c) dass ein höherer Mannschaftszusammenhalt (d.h., aufgabenbezogener Zusammenhalt und Gruppenattraktivität) die kognitive Bewertung in Form höherer persönlicher Wichtigkeit bzw. positiverer Bewältigungserwartungen hinsichtlich des bevorstehenden Mannschaftswettkampfs vorhersagte; und (d) dass eine stärkere Mannschaftsidentifikation und größere wahrgenommene ergebnisbezogene Interdependenz die Beziehung zwischen Zusammenhalt (d.h., aufgabenbezogener Gruppenintegration) und Wettkampf-Wichtigkeit vermittelte. Die Zusammenhänge zwischen Zusammenhalt und kognitiver Bewertung galten für alle Mannschaften. Allerdings unterschieden sich die Mannschaften bezüglich ihrer durchschnittlichen Wettkampf-Wichtigkeit. In der Summe deuten meine Ergebnisse darauf hin, dass ein höherer Mannschaftszusammenhalt die Leistung steigern könnte. Zum Einen, positivere Bewältigungserwartungen zu einer angenehmeren affektive Tönung und leistungsfördernden Interpretationen des emotionalen Vorstartzustands. Zum Anderen, eine höhere Wettkampf-Wichtigkeit die Motivation. Generell sind alle drei dieser Merkmale leistungszuträglich. Trainerinnen und Sportpsychologen in technisch bzw. taktisch anspruchsvollen Sportarten sollten allerdings im Bezug auf die Erhöhung des Zusammenhalts vorsichtig sein. Eine höhere Wettkampf-Wichtigkeit steigert nämlich auch die Intensität des emotionalen Vorstartzustand, welche der Leistung in solchen Sportarten schaden könnte.

Schlüsselwörter: kognitive Bewertung, Wettkampfangst, Mannschaftsidentifikation, wahrgenommene Interdependenz, Motivation

2. Introduction

Competing in sport is highly emotional because for athletes, there is much at stake. For professionals, the security of their livelihood depends on their competitive performance. For adolescents, competing in sport presents an opportunity to gauge and confirm their self-worth. For athletes in general, the outcome of a competition determines if their hours of practice and preparation, their potential sacrifices and investments were justified. However, when they go into a competition, none of these athletes know for sure if they will succeed. Thus, they might experience pressure and potentially even anxiety in anticipation of that competition.

With this potential for pressure and anxiety, wouldn't it be nice to have strong team to back you up? A single 100-meter-sprinter would have to face this situation alone. In contrast, teams, especially those that stick together, are united in the pursuit of their objectives, and satisfy their members' affective needs, would face the competition and its pressures together. Members of such teams could lean on each other, would support each other, and share potential failures. Thus, their team-members would feel less pressure, less anxiety, and instead, more excitement in anticipation of a competition – or would they not? When the 100-meter-sprinter is disqualified after a false start, primarily her own goals are obstructed. However, when a basketball player misses the crucial free throw, his entire team's championship dreams are destroyed. Thus, being part of a strong team might induce new pressures and anxieties.

Even if the specific effects are not yet clear, it makes sense that being part of a team which sticks together, is united, and satisfies members' needs would impact athletes' emotional response to a pending competition. It is important first, to describe this impact further; second, to explain its underlying mechanisms; third, to predict its manifestation; so that this knowledge can finally be used to control that a cohesive team only has positive effects on its members' emotional response and thus, ensures their successful performance and enjoyment of competitive sport.

3. Research Aims and Conceptual Model

The overarching aim of my dissertation was to explain and predict how a team's level of cohesion relates to its members' precompetitive emotional response (see Figure 1a). To this end, I conducted two large correlational field-studies and four sets of analyses, each with a separate aim. First, to determine if cohesion could function as a means of effective emotion regulation and would justify further study, as Aim 1 of Study 1, I investigated how important cohesion was to athletes' precompetitive anxiety response when compared to other selected predictors (see Chapter 7 and Figure 1b). Second, to enable subsequent steps, as Aim 2 of Study 1, I developed and initially validated a measure of precompetitive appraisal, the determinant of the precompetitive emotional response (see Chapter 9 and Figure 1c). Third, to explain the relationships between cohesion and the precompetitive emotional response, as Aim 3 of Study 1, I investigated to what extent athletes' perceptions of cohesion predicted their appraisal of a pending team competition (see Chapter 11 and Figure 1d). Fourth and finally, to elucidate the links I had found, as the aim of Study 2, I tested if team-identification and perceived interdependence mediated the relationships between perceptions of cohesion and precompetitive primary appraisal, the determinant of emotional intensity (see Chapter 13 and Figure 1e).

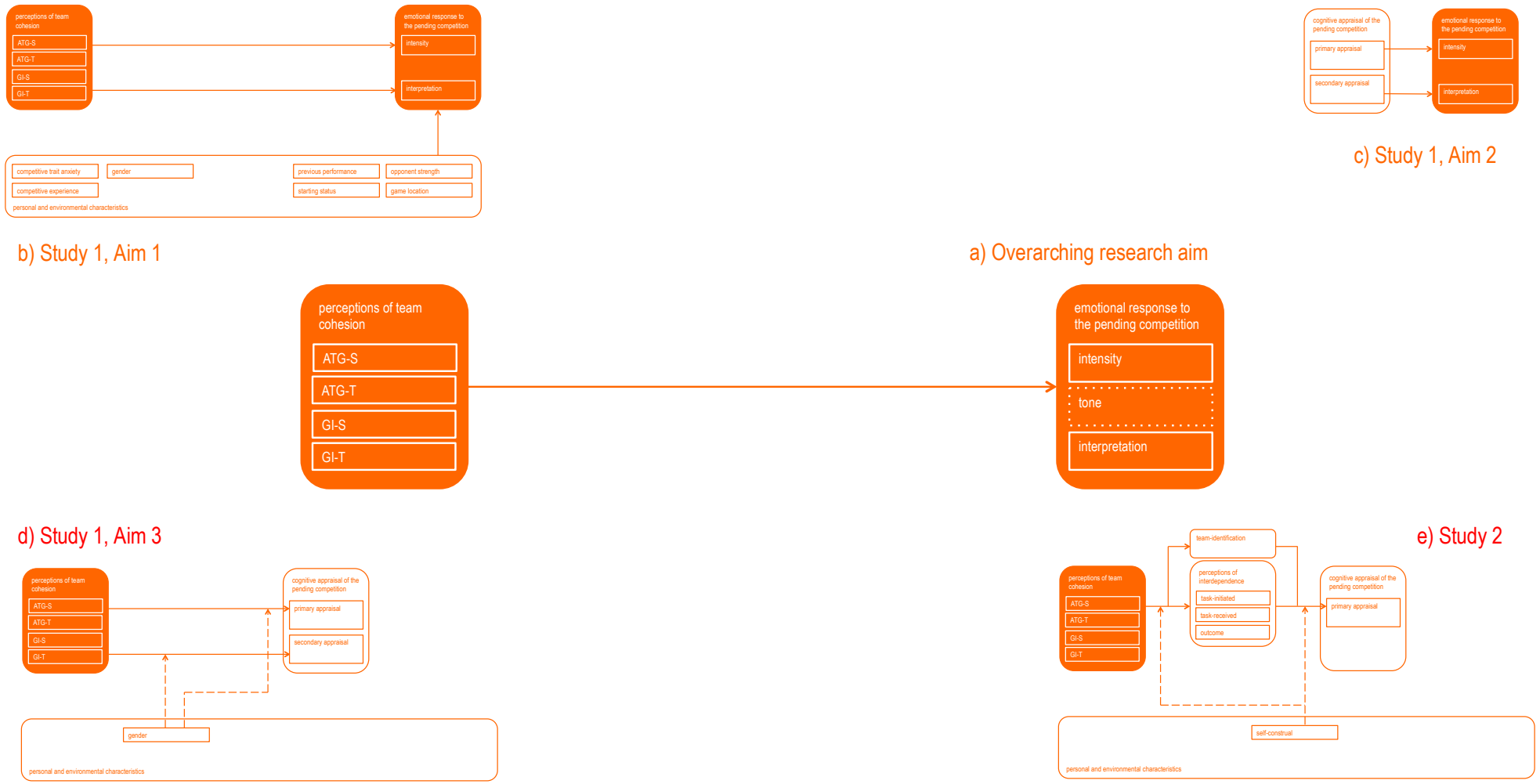

Figure 1. Overarching and Subordinate Research Aims.

ATG-S = social Individual Attractions to the Group, ATG-T = task-related Individual Attractions to the Group, GI-S = social Group Integration, and GI-T = task-related Group Integration. Solid boxes mark the dissertation's central constructs; solid lines indicate prediction, dashed lines moderation. When measuring the precompetitive anxiety response in Study 1, I assessed only intensity and interpretation, not emotional tone.

Whereas I elaborate on the different constructs, previous findings, and plausible relationships in detail below, Figure 2 provides a first overview of my expectations regarding the different research aims and functions as the conceptual model of my dissertation.

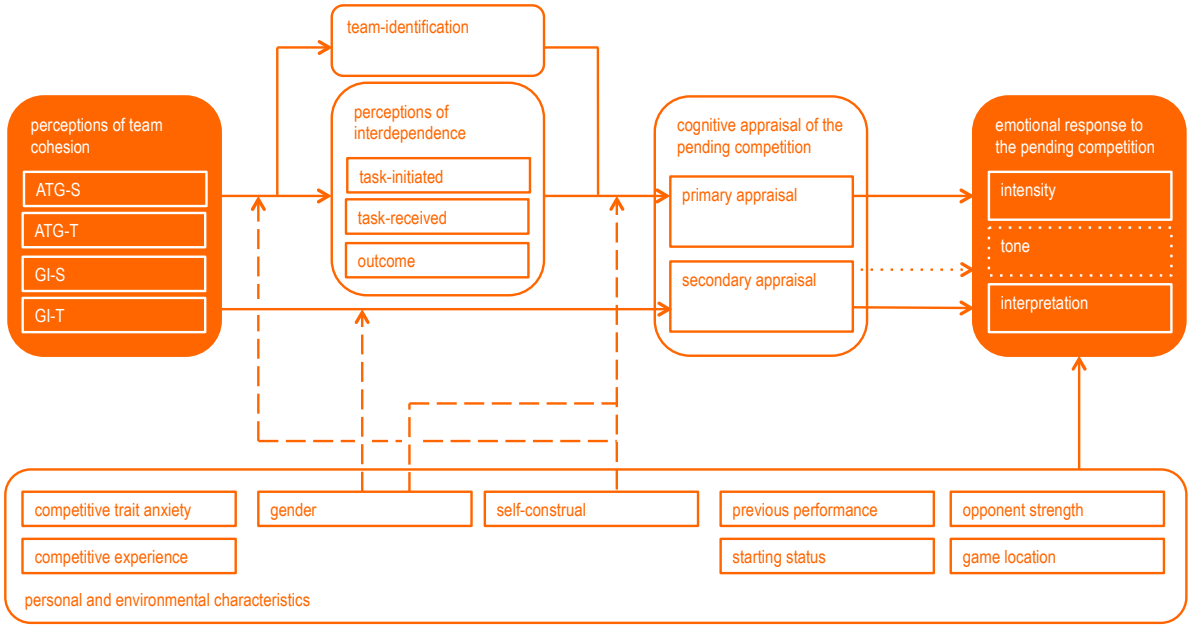

Figure 2. Conceptual Model for Relating Team Cohesion to the Precompetitive Emotional Response.

ATG-S = social Individual Attractions to the Group, ATG-T = task-related Individual Attractions to the Group, GI-S = social Group Integration, and GI-T = task-related Group Integration. Solid boxes mark the dissertation's central constructs; solid lines indicate prediction, dashed lines moderation. When measuring the precompetitive anxiety response in Study 1, I assessed only intensity and interpretation, not emotional tone.

4. Research Program and Methods

In my dissertation, I addressed four aims and conducted four sets of analyses that build on each other and followed a logical sequence. However, methodologically, these aims and analyses were based on the same two studies. Therefore, I describe the participants, measures, and data-collection procedures of these studies as a preface at this point. The specific analysis-procedures, I report separately for each aim below.

4.1 Study 1

The first of my two studies, I conducted in Canada. It provided the data to address the first three aims of my dissertation, (a) the investigation of cohesion's relative importance to the precompetitive anxiety response (Study 1, Aim 1; see Chapter 7), (b) the development and initial validation of a precompetitive appraisal measure (Study 1, Aim 2; see Chapter 9), and (c) the investigation of cohesion's ability to predict precompetitive appraisal (Study 1, Aim 3; see Chapter 11).

Participants

In total, 386 competitive intercollegiate athletes participated in Study 1. On average, athletes were 20.32 years old (*SD* = 1.85) with a competitive experience of 10.03 years (*SD* = 4.22). Further, 7.80% of athletes reported playing experience at a level higher than their current competitive level and 35.80% rated themselves as starters (vs. 29.50% non-starters and 34.70% of athletes that did not indicate their status due to time-restrictions).

The athletes came from 27 teams (*n* = 14 team; 48.70% of athletes male) that competed in the sports of volleyball (*n* = 12; 38.60%), ice hockey (*n* = 9; 41.70%), and basketball (*n* = 6; 19.70%) in the Canadian university and college leagues (*n* = 22; 85.50% and *n* = 5; 14.50%, respectively). Teams' average size was 18.15 members (*SD* = 4.87) and athletes' team tenure ranged from first to fifth year with an average of 2.24 years (*SD* = 1.30). At the point of data-collection, teams were ranked approximately fifth out of 10 in their respective leagues (*M* = 5.06, *SD* = 2.48).

Measures

Besides recording team statistics and asking athletes to report general demographic information, I employed paper-and-pencil, self-report measures to assess the variables under investigation. Although self-report may be fallible to social desirability and not always replicate objective conditions (Lazarus, 1991; Raglin & Hanin, 2000), it is appropriate to measure athletes'

subjective perceptions of such conditions and these are what ultimately determines their emotional response (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986; Lazarus, 1999).

Team cohesion. To measure athletes' perceptions of their team's level of cohesion for Aims 1 and 3 of Study 1, I employed the *Group Environment Questionnaire* (*GEQ*; Carron, Widmeyer, & Brawley, 1985). The GEQ directly reflects the conceptual model of cohesion (see Chapter 5.2.1) in the form of statements pertaining to social Individual Attractions to the Group (ATG-S; five items, e.g., "Some of my best friends are on this team.") and task-related Individual Attractions to the Group (ATG-T; four items, e.g., "I like the style of play on this team."), as well as social Group Integration (GI-S; four items, e.g., "Our team would like to spend time together in the off-season.") and task-related Group Integration (GI-T; five items, e.g., "Our team is united in trying to reach its performance goals."). Athletes respond to these statements on a scale from 1 = *strongly disagree* to 9 = *strongly agree*. Evidence for the GEQ's validity with regard to content, structure, and relationships to other variables is documented by numerous sources (e.g., Brawley, Carron, & Widmeyer, 1987; Carron et al., 1985). The GEQ's internal consistencies in Study 1 were α = .71 (ATG-S), α = .72 (ATG-T), α = .73 (GI-S), and α = .79 (GI-T).

Precompetitive appraisal. In order to be able to validly assess athletes' appraisal of a pending competition for Aim 3 of Study 1, I developed a novel measure of precompetitive appraisal. The exact procedures and properties are explained in Chapter 9. As a summary, the resultant *Precompetitive Appraisal Measure* (see Appendix) assesses athletes' agreement with statements pertaining to primary appraisal (three items, e.g., "The upcoming competition is important to me.") and secondary appraisal (three items, e.g., "The upcoming competition is likely to result in a positive outcome for me.") on a scale from 1 = *strongly disagree* to 9 = *strongly agree*. Its internal consistencies were α = .76 for Primary and α = .81 for Secondary Appraisal.

Precompetitive anxiety response. To measure the intensity and interpretation of precompetitive anxiety symptoms, as representative dimensions of athletes' precompetitive emotional response for Aims 1 and 2 of Study 1, I employed the *Directional Modification* of the *Competitive State Anxiety Inventory-2* (*CSAI-2D*; Martens, Burton, Vealey, Bump, & Smith, 1990; directional addition by Jones & Swain, 1992). The CSAI-2D is a four-dimension inventory on which athletes rate (a) their perceived intensity of nine somatic (e.g., "I feel jittery.") and nine cognitive anxiety symptoms (e.g., "I am concerned about losing.") on a scale from 1 = *not at all* to 4 = *very much so*; and (b) their interpretation of each of these symptoms with regard to their pending performance on a scale from -3 = *very debilitative* to +3 = *very facilitative*. The CSAI-2D is specific to the precompetitive situation and reflects both the multidimensional nature of anxiety as well as the

notion that athletes may experience anxiety symptoms as detrimental or beneficial to performance (see Chapter 5.1.1). I chose the CSAI-2 and its Directional Modification to keep consistent with previous research on the precompetitive emotional response and cohesion's relationship to precompetitive anxiety symptoms (see Tables 1 and 2). There has been some valid discussion with regard to the CSAI-2's accurate representation of emotional tone (e.g., whether the items correctly capture anxiety's innate unpleasantness; Lane, Sewell, Terry, Bartram, & Nesti, 1999; Perry & Williams, 1998). Yet, there remains general consensus that the CSAI-2D is a valid measure of symptom intensity and interpretation (i.e., the variables under investigation in Study 1; Wagstaff, Neil, Mellalieu, & Hanton, 2012).

When developing the measure, Martens et al. (1990) advanced evidence for the CSAI-2's validity in terms of content, factorial structure, and relationships to other variables. Later, these procedures were challenged, especially with regard to the CSAI-2's factorial validity and a shortened version of the measure was developed (Cox, Martens, & Russell, 2003). However, earlier research (see Tables 1 and 2) has always used the original CSAI-2 and in order to keep methods and results comparable (e.g., assure that changes were due to the inclusion of multiple predictors and not a difference in measurement tools; see Appendix), I made the same choice in this study. Further, results of a confirmatory factor analysis showed that the two-factor structure was acceptable for the present sample, X^2_{134} = 322.15, $p < .001$, CFI = .93, RMSEA = .06, SRMR = .05 (Bühner, 2006; Hu & Bentler, 1999). Internal consistency-values were α = .85 (intensity somatic), α = .86 (intensity cognitive), α = .91 (interpretation somatic), and α = .88 (interpretation cognitive).

Competitive trait anxiety. To assess athletes' levels of competitive trait anxiety for Aim 1 of Study 1, I used the *Sport Anxiety Scale-2* (*SAS-2*; Smith, Smoll, Cumming, & Grossbard, 2006). The SAS-2 is a three-dimension inventory on which athletes rate their *typical* intensity of precompetitive anxiety symptoms on a scale from 1 = *not at all* to 4 = *very much*. The SAS-2 appropriately reflects the precompetitive context and the multidimensional nature of trait anxiety. Specifically, the five somatic (e.g., "My muscles feel shaky.") and the five worry-related symptoms (e.g., "I worry that I will not play well.") correspond to the dimensions of the CSAI-2 and, in addition, the SAS-2 includes five items relating to concentration disruption (e.g., "I lose focus on the game."). Smith et al. (2006) provided evidence for the SAS-2's validity in terms of its test content, internal structure, and relationships to other variables. In Study 1, the scale's internal consistencies were α = .77 (concentration disruption), α = .77 (somatic), and α = .90 (worry).

Demographic and background information. Athletes reported their age, team tenure, competitive experience (i.e., number of years having competed in the specific sport; playing

experience at a level higher than the current competitive level, *yes* vs. *no*), and general starting status (*starter* vs. *non-starter*) as part of a short demographic survey. In addition, I recorded gender, type of sport, competitive league, team-size, previous performance (i.e., the team's ranking prior to the selected game), opponent strength (i.e., the opponent's ranking prior to the game), and game location (*home* vs. *away*).

Procedures

After having gain approval from the appropriate institutional ethics review board, I initially contacted head coaches of the targeted teams. I explained the aim and design of the study and asked for permission to approach their athletes. If coaches granted this permission, I scheduled a team-based information session before or after practice, or before an away game if there were travel restrictions. During this meeting, athletes learned about the details of the study and if they were willing to participate, gave informed consent and immediately completed the competitive trait anxiety and demographic measures. Finally, the athletes completed the measures of team cohesion, precompetitive appraisal, and the precompetitive anxiety response an average of 83 minutes (*SD* = 20) before the start of their next game (regular in-season competitions; *n* = 19 teams; 69.40% of athletes away; average opponent ranking *M* = 4.28, *SD* = 2.79).

4.2 Study 2

My second study, I conducted in Germany with the aim of testing if identification and interdependence mediated the relationships between cohesion and precompetitive primary appraisal (Study 2; see Chapter 13).

Participants

A total of 400 competitive club athletes (6.50% English-speaking) participated in Study 2. Those athletes were on average 24.06 years old (*SD* = 4.77) with a competitive experience of 15.05 years (*SD* = 5.23). Further, 31.10% reported playing experience at a higher level than their current competitive level, 37.30% indicated a (semi-)professional status, and 53.50% rated themselves as starters (vs. 23.10% non-starters and 23.40% of athletes that did not indicate their starting status due to time-restrictions).

The athletes came from 34 teams (*n* = 16 teams; 56.20% of athletes male) and competed in the sports of team handball (*n* = 10; 31.80%), volleyball (*n* = 10; 27.30%), basketball (*n* = 10; 23.50%), and ice hockey (*n* = 4; 17.50%) in the first to fourth German league (first league *n* = 1;

3.50%; second *n* = 13; 37.80 %; third *n* = 15; 44.80%; fourth *n* = 5; 14.00%). The average team-size was 16.75 members (*SD* = 5.49) and athletes' team tenure ranged from one to 20 years with an average of 2.81 years (*SD* = 2.54). At the point of data-collection, teams were ranked approximately sixth out of 10 to 18 in their respective leagues (*M* = 6.16, *SD* = 3.50).

Measures

As in Study 1, I also used paper-and-pencil, self-report measures to assess the variables under investigation in Study 2. In order to accommodate English-speaking participants, I provided all materials in Study 2 both in their German translation and the original English version.

Team cohesion. To assess athletes' perceptions of team cohesion, I again used the Group Environment Questionnaire (GEQ; see Chapter 4.1.2; German translation *Kohäsionsfragebogen für Individual- & Teamsport – Leistungssport*; Ohlert, 2012). In Study 2, internal consistencies of the GEQ's subscales ranged from α = .62 (ATG-T German) to α = .89 (GI-T English) with the exception of the ATG-S subscale in the English version (α = .49). As a consequence, those English-speaking participants were omitted from any analyses involving ATG-S.

Identification. To measure athletes' identification with their team, I adapted and employed three dimensions of the *TEAM*ID scale* (Heere & James, 2007; German translation and back-translation by myself and another bilingual colleague). Specifically, I changed the items to refer to "this team" instead of fans' "college football team" and selected the dimensions of Private Evaluation (four items, e.g., "I am proud to think of myself as a member of this team."), Interconnection of Self (five items, e.g., "The team I am a member of is an important reflection of who I am."), and Sense of Interdependence (three items, e.g., "My destiny is tied to the destiny of this team."). Further, to keep consistent with the GEQ, I extended the original seven-point response scale to nine points ranging from 1 = *strongly disagree* to 9 = *strongly agree*. Whereas Heere and James (2007) provided evidence for the TEAM*ID scale's initial reliability and validity, internal consistencies in Study 2 were α = .88 (Private Evaluation), α = .75 (Interconnection of Self), and α = .85 (Sense of Interdependence).

Interdependence. To assess team-members' perceptions of interdependence, I adapted and used items developed by Bruner, Hall, and Côté (2011) and Van der Vegt, Emans, and Van de Vliert (1998; German translation and back-translation by myself and another bilingual colleague). Specifically, I omitted the addition "or other athletes I practice with" from Bruner et al.'s Received Task Interdependence (three items, e.g., "I depend on my teammates to perform well.") and positive Outcome Interdependence dimensions (six items, e.g., "It benefits me when my teammates attain

their goals.") and added an Initiated Task Interdependence dimension (three items, e.g., "My teammates depend on me to perform well.") as a combination of Van der Vegt et al.'s original items and Bruner et al.'s sport-specific adaptation. Again, to keep formats consistent, I extended the original five-point response scale to range between 1 = *strongly disagree* and 9 = *strongly agree*. Bruner et al. and Van der Vegt et al. provided indications of the scales' reliability and validity. Internal consistencies in Study 2 were α = .72 (Initiated Task Interdependence), α = .73 (Received Task Interdependence), and α = .82 (Outcome Interdependence).

Precompetitive primary appraisal. To measure athletes' precompetitive primary appraisal, I employed the Primary Appraisal subscale from the Precompetitive Appraisal Measure I had developed in Study 1 (see Chapter 9; German translation and back-translation by myself and another bilingual colleague). The subscale's internal consistency in Study 2 was α = .75.

Interdependent self-construal. To assess athletes' interdependent self-construal, I used the Interdependence subscale from the *Self-Construal Scale* (*SCS*; Singelis, 1994; German translation Hannover, Kühnen, & Birkner, 2000). The subscale includes 12 statements (e.g., "I will sacrifice my self-interest for the benefit of the group I am in.") and I extended the original seven-point response scale once more to range between 1 = *strongly disagree* and 9 = *strongly agree*. Whereas Singelis (1994) provided indications for the SCS's reliability and validity, internal consistency for Interdependent Self-Construal in Study 2 was α = .67.

Demographic and background information. Similar to Study 1, athletes reported their age, team tenure, competitive experience (i.e., number of years having competed in the specific sport; playing experience at a level higher than the current competitive level), professional status (i.e., income provided by playing their sport, *yes* vs. *no*), and general starting status as part of a short demographic survey. Also as in Study 1, I recorded gender, type of sport, competitive league, team-size, previous performance (i.e., the team's ranking prior to the selected game), opponent strength (i.e., the opponent's ranking prior to the game), and game location.

Procedures

After the appropriate institutional ethics review board had appraised the study positively, I contacted eligible teams' head coaches and requested permission to approach their athletes. If coaches granted such permission, I conducted a team information-session before or after practice during which I explained the study and, if athletes agreed to participate, collected their informed consent, demographic information, and assessments of self-construal. For away teams (n = 11 teams; 30.80% of athletes), I conducted these information-sessions immediately prior to data-

collection. I then collected assessments of athletes' perceived cohesion, team-identification, perceived interdependence, and precompetitive primary appraisal on average 73 minutes (*SD* = 16) prior to their next game (i.e., regular in-season competitions; average opponent ranking *M* = 7.31, *SD* = 3.41).

5. The Precompetitive Emotional Response

5.1 Definition and Consequences

Although athletes likely experience multiple emotions in response to various events in the period prior to a competition (Nicholls, Levy, Jones, Rengamani, & Polman, 2011), their emotional response to the pending competition itself is considered one of the most influential factors when relating psychological attributes to competitive success (Lane, Beedie, Jones, Uphill, & Devonport, 2012; Uphill & Jones, 2007). Predominantly, this precompetitive emotional response has been equated with precompetitive anxiety, that is, "a feeling of worry, nervousness, or unease" (New Oxford American Dictionary, 2012) with regard to a pending competition. The precompetitive anxiety response comprises physiological arousal and tension, negative performance expectations, worries about potential failure, and a behavioral avoidance orientation (i.e., emotional intensity; see Figure 3) that the respective athletes experience as unpleasant (i.e., emotional tone; see Figure 3; Eysenck, Derakshan, Santos, & Calvo, 2007; Hale & Whitehouse, 1998). Because, for example, the worry-related thoughts distract from the task at hand (Eysenck et al., 2007) or foster an enhanced self-focus that disrupts automatic mechanisms (Masters & Maxwell, 2008) and the unpleasant tone decreases enjoyment (Scanlan, Babkes, & Scanlan, 2005), precompetitive anxiety generally can be expected to decrease performance (Bray, Martin Ginis, Hicks, & Woodgate, 2008; Englert & Bertrams, 2012), health (Andersen, 2006; Ivarsson & Johnson, 2010), and adherence (Gould, Feltz, Horn, & Weiss, 1982; Hill & Shaw, 2013).

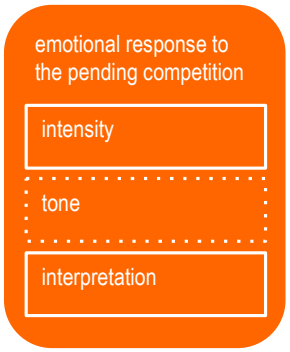

Figure 3. Dimensions of the Precompetitive Emotional Response.
Solid boxes mark the dissertation's central constructs. When measuring the precompetitive anxiety response in Study 1, I assessed only intensity and interpretation, not emotional tone.

Over the last decades, scholars have debated whether precompetitive anxiety necessarily always hurts performance and advanced two explanations for its seemingly positive effects. First, while they still respond to a pending competition with anxiety, athletes may have learned to successfully utilize or cope with their anxiety (Mellalieu, Neil, & Hanton, 2006; Neil, Hanton, Mellalieu, & Fletcher, 2011). With respect to the latter, athletes might try to reduce the intensity of their anxiety symptoms (i.e., response modulation; Gross & Thompson, 2007) and thus, the

symptoms' influence on performance; or they try to re-interpret the situation (i.e., cognitive change; Gross & Thompson, 2007) and thus, change their emotional response entirely. Second, while they still exhibit symptoms similar to those of anxiety, athletes may have responded to the competition with a different, more positive emotion in the first place and this response may have been mislabeled as anxiety (Cerin, Szabo, Hunt, & Williams, 2000; Nicholls, Polman, Levy, & Hulleman, 2012).

The positive alternative to precompetitive anxiety is *precompetitive excitement*, that is, "a feeling of great enthusiasm and eagerness" (New Oxford American Dictionary, 2012) with regard to a pending competition. The precompetitive excitement response is similar to precompetitive anxiety in that it also comprises physiological arousal and performance-related thoughts (Jones & Uphill, 2004). However, in the case of excitement these thoughts relate to positive performance expectations and potential gains, the behavioral tendency is approach oriented, and athletes experience these symptoms as pleasant (Hale & Whitehouse, 1998; Jones & Uphill, 2004). Because, for example, the gain-oriented thoughts facilitate decision making (Isen, 2009), the approach orientation prompts additional effort (Tomaka, Blascovich, Kelsey, & Leitten, 1993), and the pleasant tone fosters enjoyment (Kraiger, Billings, & Isen, 1989), precompetitive excitement generally can be expected to increase performance (Lane, Devonport, Soos, Karsai, Leibinger, & Hamar, 2010; Nicholls, Polman, & Levy, 2012), health (Fredrickson, 2001; Isen, 2009), and adherence (McCarthy & Jones, 2007; Skinner & Brewer, 2004).

Although excitement is generally preferred over anxiety, the optimal performance-, health-, and adherence-conducive precompetitive emotional response depends on the particular athlete and task. For example, technically and tactically demanding tasks (e.g., fencing, volleyball) suffer more from high emotional intensity than strength and endurance based tasks (e.g., weightlifting, long-distance running; Cerin et al., 2000). Further, athletes differ with regard to their individually preferred type and intensity of emotions (cf. individual zones of optimal functioning theory; Hanin, 2000).

Prompted by the latter, Jones and colleagues (e.g., Jones, 1991; Jones & Swain, 1992) suggested incorporating athletes' interpretation of their initial emotion symptoms as debilitative or facilitative to performance as an additional dimension to the precompetitive emotional response (see Figure 3). During the interpretation-process, athletes judge (a) whether their emotion symptoms will impact their subsequent performance and (b) whether this impact will be detrimental or beneficial (e.g., due to the initial emotional tone or athletes' ability to cope with the emotion; Fletcher & Fletcher, 2005; Neil et al., 2011). Generally, athletes are more likely to interpret precompetitive anxiety as debilitative and precompetitive excitement as facilitative to performance (Jones & Uphill,

2004; Robazza, Pellizzari, Bertollo, & Hanin, 2008). Facilitative interpretations, in turn, are linked to more positive emotion-related consequences (Fletcher & Fletcher, 2005; Neil, Wilson, Mellalieu, Hanton, & Taylor, 2012). Therefore, to assure athletes' success, physical and mental health, and long-term adherence it is crucial to be able to (a) decrease an unpleasant tone and debilitative interpretations, (b) increase a pleasant tone and facilitative interpretations, and (c) regulate intensity to task and individually appropriate levels.

5.2 Regulating the Precompetitive Emotional Response

Athletes acknowledge that the ability to regulate their emotional response is crucial to successful performance and emotion regulation represents a dominant subject of sport psychology consultants' work (Lane et al., 2012; Mellalieu & Lane, 2009). For example, athletes commonly use strategies such as relaxation, visualization, self-talk, thought stopping, or cognitive restructuring to control and optimize their emotional response (Neil, Hanton, & Mellalieu, 2013; Raglin & Hanin, 2000; Tamminen & Crocker, 2013). However, in the context of regulating athletes' emotional response to a pending competition, these strategies might have some disadvantages because they are often implemented within the precompetitive situation itself. Although they successfully regulate the precompetitive emotional response, such strategies may consume important attentional capacity and leave fewer resources to prepare and perform the task at hand (Lane et al., 2012; Tice & Bratslavsky, 2000). A proactive approach to regulating the precompetitive emotional regulation would thus be preferred (e.g., training under conditions of anxiety; Oudejans & Pijpers, 2010). In other words, "prevention might be better than cure." (Lane et al., 2012, p. 1192). Yet, prevention of an unpleasant tone, debilitative interpretations, or excessive intensity requires knowledge regarding their antecedents and influences (Uphill & Jones, 2007). For example, studies found that competing away elicits higher emotional intensity (Polman, Nicholls, Cohen, & Borkoles, 2007; Thuot, Kavouras, & Kenefick, 1998), which coaches may now try to prevent through strategies such as specific game planning. Alternatively, coaches may try to compensate for athletes' lack of competitive experience through competition simulation and thus prevent the more debilitative interpretations these athletes were found to have (Hanton, Cropley, Neil, Mellalieu, & Miles, 2007; Hanton, Neil, Mellalieu, & Fletcher, 2008).

5.3 Predictors of the Precompetitive Emotional Response

Past research has identified numerous athlete- and task-related predictors of the precompetitive emotional response. On demographic and personality-related levels, studies found,

for example, gender (Anshel, Jamieson, & Raviv, 2001; Beauchamp, Bray, Eys, & Carron, 2003), competitive experience (Hanton et al., 2008; Mellalieu, Hanton, & O'Brien, 2004), and competitive trait anxiety (Ehrlenspiel, Graf, Kühn, & Brand, 2011; Hanton, Mellalieu, & Hall, 2002) to influence the precompetitive emotional response. On a task-related or environmental level, they found factors such as playing time/starting status (i.e., *starters* who begin a game playing vs. *non-starters* who are waiting to be substituted for one of the starters; Alix-Sy, Le Scanff, & Filaire, 2008; Guillén & Sánchez, 2009), previous performance (Jones, Swain, & Cale, 1990; Neil et al., 2012), level of opposition (Hill & Shaw, 2013; Thuot et al., 1998), and game location (Polman et al., 2007; Thuot et al., 1998) to have an effect. An overview of these findings and specific relationships to symptom intensity and interpretation are displayed in Table 1.

Table 1. Common Predictors of the Precompetitive Emotional Response and Their Relationships to Symptom Intensity and Interpretation.

Predictor	Intensity of emotion symptoms	Interpretation of emotion symptoms
Demographic:		
Gender	No relationship (Hammermeister & Burton, 2001)	
	Male = lower intensity (e.g., Beauchamp et al., 2003; Martens et al., 1990; Thuot et al., 1998)	Male = more facilitative interpretations (e.g., Anshel et al., 2001; Perry & Williams, 1998)
Competitive experience	No direct relationship (Guillén & Sánchez, 2009)	
	More competitive experience = lower intensity (e.g., Gould et al., 1984; Mellalieu et al., 2004)	More competitive experience = more facilitative interpretations (e.g., Hanton & Jones, 1999; Hanton et al., 2008)
Personality-related:		
Competitive trait anxiety	Less trait anxiety = lower intensity (e.g., Ehrlenspiel et al., 2011; Smith, Smoll, et al., 2006)	Less trait anxiety = more facilitative interpretations (e.g., Cerin & Barnett, 2011; Hanton, Mellalieu, & Hall, 2002)
Task-related/environmental:		
Starting status	Starters/more playing time = lower intensity (e.g., Alix-Sy et al., 2008; Guillén & Sánchez, 2009)	Starters/more playing time = more facilitative interpretations (e.g., Alix-Sy et al., 2008; Coker & Mickle, 2000)

Table 1 continued.

Predictor	Intensity of emotion symptoms	Interpretation of emotion symptoms
Previous performance	No strong relationships (Gould et al., 1984; Hanton & Jones, 1995)	
	Better previous performance = lower intensity (e.g., Guillén & Sánchez, 2009; Jones et al., 1990)	Better previous performance = more facilitative interpretations (e.g., Neil et al., 2011; Neil et al., 2012)
Opponent strength	Weaker opponent = lower intensity (e.g., Hill & Shaw, 2013; Thuot et al., 1998)	Weaker opponent = more facilitative interpretations (e.g., Mendes et al., 2001)
Game location	No strong relationships (Bray & Martin, 2003)	
	Home = lower intensity (e.g., Bray et al., 2002; Polman et al., 2007; Thuot et al., 1998)	

However, in contrast to athlete- and task-related predictors, athletes' social environment has received much less attention. This is also reflected by common precompetitive emotion regulation strategies, which focus predominantly on the individual athlete (Eys, Hardy, Carron, & Beauchamp, 2003). Such a concentration is unwise, because virtually all athletes are nested within a social context of coaches, teams, families, and friends, and this context can well be expected to improve or exacerbate their emotional response to an upcoming competition (Babkes Stellino, Partridge, & Moore, 2012; Kleinert et al., 2012). In fact, the research that has been done supports the influence of, for example, coach-initiated motivational climate (O'Rourke, Smith, Smoll, & Cumming, 2011), parental pressure (Gould, Lauer, Rolo, Jannes, & Pennisi, 2008), and peer acceptance (Smith, Balaguer, & Duda, 2006).

In sport, athletes' most immediate and potentially most influential social group is their athletic team (Bruner, Boardley, & Côté, 2014), a central indicator of whose psychosocial quality is the level of team cohesion (Estabrooks, 2007).

6. Team Cohesion

6.1 Definition and Conceptualization

Cohesion constitutes "a dynamic process that is reflected in the tendency for a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of member affective needs." (Carron, Brawley, & Widmeyer, 1998, p. 213) In line with this definition, cohesion operates on an individual level, called *Individual Attractions to the Group* (i.e., *ATG*) and on a group level, called Group Integration (i.e., GI), both of which manifest themselves in terms of social and task-related concerns, resulting in a total of four dimensions (see Figure 4; Carron et al., 1985). Social Individual Attractions to the Group (i.e., ATG-S) describe "individual team member[s] feelings about [their] personal acceptance, and social interaction with the group" (Carron et al., 1998, p. 217); task-related Individual Attractions to the Group (i.e., ATG-T) refer to "individual team member[s] feelings about [their] personal involvement with the group task, productivity, and goals and objectives" (Carron et al., 1998, p. 217). Similarly, social Group Integration (i.e., GI-S) describes "individual team member[s] feelings about the similarity, closeness, and bonding within the team as a whole around the group as a social unit (Carron et al., 1998, p. 217) and task-related Group Integration (i.e., GI-T) refers to "individual team member[s] feelings about the similarity, closeness, and bonding within the team as a whole around the group's task (Carron et al., 1998, p. 217).

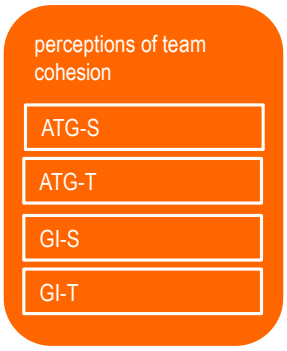

Figure 4. Dimensions of Team Cohesion.
ATG-S = social Individual Attractions to the Group, ATG-T = task-related Individual Attractions to the Group, GI-S = social Group Integration, and GI-T = task-related Group Integration. Solid boxes mark the dissertation's central constructs.

6.2 Cohesion and the Precompetitive Emotional Response

As one of few social factors, cohesion has been linked to the precompetitive emotional response, specifically, dimensions of precompetitive anxiety. Detailed results of these investigations are displayed in Table 2. In summary, these indicate that perceptions of higher task cohesion, particularly GI-T, relate to a lower intensity and more facilitative interpretations of precompetitive anxiety symptoms in a variety of samples. This notion is complemented by findings that relate

Table 2. Significant Relationships Between Perceptions of Team Cohesion and Dimensions of the Precompetitive Anxiety Response.

Dimension of the anxiety response	Investigators	Dimension of cohesion	Type and strength of relationship[a]	Sample
Intensity	McDonald (1993)	ATG-T	r = .23* (somatic); r = -.16* (cognitive)	Female and male competitive adolescent athletes from individual and interactive sports
		GI-S	r = -.21* (cognitive)	
		GI-T	r = -.20* (cognitive)	
	Prapavessis and Carron (1996)[b]	ATG-T	r = -.21* (somatic); r = -.29** (cognitive)	Male and female competitive adult athletes from interactive sports
	Eys, Hardy, Carron, and Beauchamp (2003)[c]	ATG-T	r = -.11* (cognitive)	Male and female competitive adolescent and adult athletes from interactive sports
		GI-T	r = -.12* (somatic); r = -.13* (cognitive)	
	Chicau Borrego, Cid, and Silva (2012)[c]	ATG-T	r = -.26** (cognitive)	Predominantly male national-level adolescent soccer players
		GI-T	r = -.26** (somatic); r = -.44** (cognitive)	
	Angelonidis, Psychountaki, and Stavrou (2013)	Social cohesion[d]	High cohesion group lower intensity than medium and low cohesion groups: F = 10.10** (cognitive)	Female and male national-level adult volleyball players
	Martin, Carron, Eys, and Loughead (2013)	Social cohesion[e]	r = -.32** (somatic); r = -.37** (cognitive)	Female and male child athletes from individual and interactive sports
		Task cohesion[e]	r = -.49** (somatic and cognitive)	

Table 2 continued.

Dimension of the anxiety response	Investigators	Dimension of cohesion	Type and strength of relationship[a]	Sample
Interpretation	Eys, Hardy, Carron, and Beauchamp (2003)[c]	ATG-T	Facilitators higher cohesion than Debilitators: $F = 5.86$* (cognitive)	Male and female competitive adolescent and adult athletes from interactive sports
		GI-T	Facilitators higher cohesion than Debilitators: $F = 5.35$* (somatic); $F = 8.20$** (cognitive)	

Note. ATG-T = task-related Individual Attractions to the Group, GI-S = social Group Integration, GI-T = task-related Group Integration; Facilitators = Athletes who experienced precompetitive anxiety symptoms of some intensity and interpreted these symptoms as extremely (i.e. upper tertile of the distribution) facilitative to performance; Debilitators = Athletes who experienced precompetitive anxiety symptoms of some intensity and interpreted these symptoms as extremely (i.e. lower tertile of the distribution) debilitative to performance.

[a]Type of precompetitive anxiety symptoms in parentheses. [b]Did not investigate ATG-S due to the subscale's insufficient internal consistency. [c]Measured task cohesion only. [d]Sum of ATG-S and GI-S. [e]The Child Sport Cohesion Questionnaire (Martin et al., 2013) only distinguishes social and task dimensions of cohesion.

*$p < .05$. **$p < .01$

athletes' perceptions of higher cohesion to lower perceived stress (Balbim, do Nascimento, & Vieira, 2012; Henderson, Bourgeois, LeUnes, & Meyers, 1998), decreased burnout (Kjørmo & Halvari, 2002), and a reduced tendency to choke under pressure (Hill & Shaw, 2013). These findings are in line with results from military psychology that have linked higher unit cohesion to reductions in manifest anxiety (Julian, Bishop, & Fiedler, 1966), higher well-being (Griffith, 2002), and less distress in the form of anxiety, depression, hostility, and somatization (Gilbar, Ben-Zur, & Lubin, 2010).

6.3 Cohesion as a Strategy for Emotion Regulation

Effective applied efforts to proactively regulate the precompetitive emotional response depend on predictors' amenability to intervention-induced change. If predictors are relatively difficult to manipulate, they require time- and potentially cost-intensive interventions. Conversely, if predictors are dynamic and relatively easy to manipulate, less extensive efforts could be fruitful. With regard to the predictors of the precompetitive emotional response (see Table 1), gender, starting status, opponent strength, and game location are stable factors that are difficult or impossible to modify. Naturally, athletes can acquire strategies to cope with disadvantageous conditions. Yet, conditions themselves cannot be modified. Other predictors such as the amount of competitive experience, level of competitive trait anxiety, and previous performance could be changed but only with much time and effort. In contrast, the level of team cohesion is more dynamic and would thus be somewhat easier to change, for example as a means of emotion regulation.

There are several reasons why the level of team cohesion could provide an apt strategy to regulate the precompetitive emotional response. First, the level of cohesion is dynamic by definition, meaning it changes and can be changed (Carron et al., 1998). Thus, cohesion would be malleable to interventions by coaches and sport psychology professionals (e.g., Cogan & Petrie, 1995; Copeland, Bonnell, Reider, & Burton, 2009). Second, higher cohesion is related to a lower intensity and more facilitative interpretations of precompetitive anxiety symptoms (see Table 2). Thus, increases in cohesion can be expected to lead to a more performance-conducive precompetitive emotional response (Bray et al., 2008; Fletcher & Fletcher, 2005). Third, in a sport setting, teams are ubiquitous (e.g., intercollegiate, training-center, or national teams; Wagstaff et al., 2012) and high levels of interdependence among group members have been demonstrated within both group and independent sport contexts (Evans, Eys, & Wolf, 2013). Thus, a regulation strategy centered on team cohesion could apply to virtually all sport contexts. Fourth, increases in cohesion affect an entire team at once. Thus, such a regulation approach would be more convenient and cost-effective

than conventional, individual-focused approaches (e.g., Mellalieu, Hanton, & Thomas, 2009). Finally, methods to increase cohesion are usually implemented prior to the precompetitive situation. Thus, they satisfy the requirement of being proactive rather than reactive (Lane et al., 2012).

However, before targeting cohesion as a means for precompetitive emotion regulation and studying it further, it should be established how important cohesion is to athletes' precompetitive emotional response when compared to other selected predictors.

7. Study 1, Aim 1: The Relative Importance of Team Cohesion

Figure 5. Schematic Representation of Study 1, Aim 1.
ATG-S = social Individual Attractions to the Group, ATG-T = task-related Individual Attractions to the Group, GI-S = social Group Integration, and GI-T = task-related Group Integration. Solid boxes mark the dissertation's central constructs; solid lines indicate prediction.

In a precompetitive situation, athletes are usually influenced by an array of factors simultaneously. As individuals, they possess particular demographic and personality characteristics; as competitive athletes, they face certain task-related and environmental constraints; and as team-members, they operate within unique social surroundings. Therefore, in order to establish which among these factors are most important and would offer the greatest revenue in terms of emotion regulation, their influence on the precompetitive emotional response should also be investigated simultaneously. If it was known which predictors are relatively most important, the effectiveness of applied efforts could be enhanced by specifically focusing on these factors and targeting appropriate levels of intervention (e.g., individual athlete vs. entire team vs. external factors).

In my first study, I investigated the relative importance of selected predictors with regard to the precompetitive anxiety response. I focus on precompetitive anxiety because it is especially likely to decrease athletes' performance, health, and adherence (e.g., Englert & Bertrams, 2012; Ivarsson & Johnson, 2010) and thus, would be particularly important to regulate. In addition, I limited the number of predictors in order to avoid overfitting during analyses (cf. Tabachnick & Fidell, 2007). Specifically, I made sure all levels (i.e., demographic, personality-related, task-related/environmental, social) were represented and predictors provided a good reference in terms of previous links to the precompetitive anxiety response (see Tables 1 and 2).

Although each of these factors on its own has been found to predict the precompetitive anxiety response, few studies have examined more than one variable at a time. As notable exceptions with regard to the intensity of precompetitive anxiety symptoms, Gould, Petlichkoff, and Weinberg (1984) identified competitive experience (compared to competitive trait anxiety, perceived athletic ability, and previous competitive outcome) as the strongest predictor, whereas Jones, Swain, and Cale (1990) and Hanton and Jones (1995) reported athletes' perceived readiness and conditions of the competition-venue (compared to position goals, attitudes toward previous performance, and coach's influence) as most important. Finally, Guillén and Sanchez (2009) found that only playing time per game mattered (compared to age, competitive experience, and position; see Table 1).

With regard to the interpretation of precompetitive anxiety symptoms, qualitative inquiries by Guillén and Sánchez (2009) as well as Neil et al. (2012) found that athletes attributed their facilitative symptom interpretation mainly to high levels of state self-confidence, which in turn were due to successful previous performances or positive perceptions of ability. Whereas these studies provide interesting insights, they are limited in scope with regard to two aspects: (a) the relative importance of the various predictors with regard to both intensity and interpretation of precompetitive anxiety symptoms; and (b) the simultaneous inclusion of several predictor categories (i.e., demographic, personality-related, task-related/environmental, social).

As a consequence, it is unknown which among gender, competitive experience, competitive trait anxiety, starting status, previous performance, opponent strength, game location, and team cohesion has the greatest impact on the precompetitive anxiety response and would offer the best prospects for successful response regulation.

7.1 Research Aim and Hypotheses

As the first step in my dissertation and the first aim of Study 1, I investigated which among a selection of predictors contributed the most to both the intensity and interpretation of precompetitive anxiety symptoms and how important team cohesion was in this context. That is, if team cohesion could function as a means of effective anxiety regulation and justified further study. Although I could not anticipate predictors' relative contributions because of a lack of previous research, existing results led me to hypothesize that a lower intensity and more facilitative interpretations of precompetitive anxiety symptoms would be predicted by (a) a male gender, (b) a higher amount of competitive experience, (c) a lower level of competitive trait anxiety, (d) a starter status, (e) a better

previous performance, (f) a weaker opponent, (g) a home game location, and (h) a higher level of team cohesion (see Tables 1 and 2 for supporting references).

7.2 Specific Methods

The present set of analyses was based on Study 1 as described in Chapter 4.1. However, analyses were based on a reduced subsample because not all athletes were able to complete the measure of trait anxiety due to time-restrictions. A full set of responses was provided by 252 athletes (56.70% male), 11.90% of whom reported playing experience at a level higher than their current competitive level and 54.80% of whom rated themselves as starters. The majority of athletes played volleyball (46.00% vs. 27.00% each basketball and ice hockey) and competed in the university league (84.10%). The average team size was 16.51 members (*SD* = 4.40) and at the point of data-collection, teams were ranked approximately fifth out of 10 in their respective leagues (*M* = 4.85, *SD* = 2.81). Their opponents were ranked about the same (*M* = 5.17, *SD* = 2.82) and the majority of teams competed away (56.00%).

Among the variables I measured in Study 1, relevant for the present set of analyses were team cohesion (as assessed with the Group Environment Questionnaire), the precompetitive anxiety response (as assessed with the Directional Modification of the Competitive State Anxiety Inventory-2), and competitive trait anxiety (as assessed with the Sport Anxiety Scale-2) as well as demographic and background information. Subscales' internal consistencies for the reduced sample are displayed in Table 3.

7.3 Analyses and Results

Descriptive results of athletes' perceptions of team cohesion, precompetitive anxiety response, and competitive trait anxiety are presented in Table 3. In order to establish the relative importance of the selected variables with regard to the precompetitive anxiety response, I conducted logistic regression analyses with each of the four anxiety-dimensions (i.e., intensity and interpretation of somatic symptoms, intensity and interpretation of cognitive symptoms) as dependent variables. I chose logistic regression because it adequately addresses the present aim of investigating the relative contribution of individual predictors; that is, it "allows evaluation of the contribution made by each predictor over and above that of the other predictors. In other words, each predictor is evaluated as if it entered the equation last" (Tabachnick & Fidell, 2007, p. 454). As compared to discriminant or logit analysis, logistic regression allows for a mix of continuous and discrete predictors (e.g., competitive trait anxiety and gender) and, as compared to multiple

Table 3. Mean Scores and Bivariate Correlations for Athletes' Perceptions of Team Cohesion, Precompetitive Anxiety Response, and Competitive Trait Anxiety as Pertaining to Study 1, Aim 1 (Subscales' Internal Consistencies in Parentheses).

Variable	*M*	*SD*	Scale	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
Team cohesion:													
1. ATG-S (α = .72)	7.54	1.27	1 to 9	.23**	.46**	.37**	.01	-.16*	.03	.08	-.07	-.11	-.25**
2. ATG-T (α = .76)	6.17	1.09	1 to 9	–	.20**	.21**	-.01	-.11	.03	.09	-.09	-.10	-.10
3. GI-S (α = .76)	7.10	1.36	1 to 9		–	.44*	-.09	-.08	-.08	-.03	-.06	-.02	-.16*
4. GI-T (α = .74)	6.31	0.93	1 to 9			–	-.01	-.08	-.05	-.02	.02	-.002	-.18**
Precompetitive anxiety response:													
5. Intensity somatic (α = .83)	1.64	0.47	1 to 4				–	.59**	-.34**	-.29**	.63**	.43**	.25**
6. Intensity cognitive α = .83)	1.99	0.57	1 to 4					–	-.34**	-.45**	.41**	.63**	.27**
7. Interpretation somatic (α = .91)	0.72	1.14	-3 to +3						–	.80**	-.26**	-.31**	-.15*
8. Interpretation cognitive (α = .88)	0.43	1.21	-3 to +3							–	-.24**	-.43**	-.18**
Competitive trait anxiety:													
9. Somatic (α = .76)	1.60	0.45	1 to 4								–	.49**	.29**
10. Worry (α = .90)	2.13	0.65	1 to 4									–	.35**
11. Concentration (α = .74)	1.38	0.37	1 to 4										–

Note. *N* = 252 for all, except intensity somatic (*N* = 251), somatic trait anxiety (*N* = 250), and ATG-S (*N* = 251). ATG-S = social Individual Attractions to the Group, ATG-T = task-related Individual Attractions to the Group, GI-S = social Group Integration, GI-T = task-related Group Integration.

*p < .05. **p < .01

regression analysis, it is more flexible with regard to predictors' distributions (e.g., negative skewness of perceptions of team cohesion, see Table 3; Tabachnick & Fidell, 2007).

Due to the exploratory nature of these analyses and the number of simultaneous predictors, I employed an extreme-groups approach to help detect potential effects (cf. Eys et al., 2003; Taris & Kompier, 2006) and identify which factors were powerful enough to discriminate between these groups. To this end, I classified participants into tertile-split groups of lower/medium/higher symptom intensity and more facilitative/neutral/more debilitative symptom interpretation, and only used the extreme groups (i.e., lower/higher intensity; somatic n = 130, cognitive n = 124; more facilitative/more debilitative interpretation; somatic n = 130, cognitive n = 123) in subsequent analyses. This created four dummy variables (i.e., one for each anxiety dimension), with *higher intensity* and *more debilitative interpretation* as response categories (= 1) and *lower intensity* and *more facilitative interpretation* as reference categories (= 0) to be used as the required binary criteria for logistic regression. The individual predictors I entered into these regression analyses included: gender, competitive experience (two indicators: years of experience in the sport, playing experience at a higher level), competitive trait anxiety (three dimensions: somatic, worry, concentration disruption), general starting status, previous team performance (team's own ranking), opponent strength (opponent's ranking), game location, and athletes' perceptions of team cohesion (four dimensions: ATG-S, ATG-T, GI-S, GI-T).

As Table 4 shows, the full set of variables significantly predicted all four anxiety dimensions (Nagelkerke's r^2 = .26 - .65) and correctly classified 66.90 - 85.40% of athletes into their respective groups. Regarding *somatic* anxiety symptoms, a higher level of competitive trait anxiety (somatic), better previous team performance (i.e., a higher team ranking), and an away game location were significant individual predictors of more intense somatic symptoms. The magnitude and direction of individual predictors' effects is obtained by subtracting 1 from their respective odds ratios (see Table 4; Tabachnick & Fidell, 2007). Thus, in the case of competitive trait anxiety and somatic symptom intensity, a value of 7.54 indicates that athletes who exceed their peers in trait anxiety by one unit are 754.00% more likely to be in the high intensity-group (i.e., the response category) than their lower trait anxious counterparts. Conversely, in the case of game location, a value of -0.86 indicates an 86.00% *decrease* in odds of being high in somatic symptom intensity when game location rises by one unit (i.e., changes from *away* to *home*). Accordingly, a higher level of competitive trait anxiety (worry) and lower perceptions of team cohesion (ATG-S) were significant individual predictors of a more debilitative interpretation of somatic symptoms. Regarding *cognitive* anxiety symptoms, a

higher level of competitive trait anxiety (worry) was the only significant individual predictor of both more intense symptoms and a more debilitative interpretation of these symptoms.

Table 4. Results of Logistic Regression Analyses and Significant Individual Predictors of Athletes' Precompetitive Anxiety Response (Extreme-Groups).

Precompetitive anxiety response	X^2	*df*	*p*	Nagelkerke's r^2	% classified
Intensity somatic (*n* = 130)	87.20	14	< .001	.65	85.40
Significant predictors:	B	*SE*	Wald's X^{2a}	*p*	Odds ratio
Trait anxiety somatic	2.15	0.45	22.56	< .001	8.54
Own ranking	1.34	0.41	10.95	.001	3.82
Game location[b]	-1.98	0.73	7.34	.007	0.14
Intensity cognitive (*n* = 124)	72.99	14	< .001	.60	80.60
Significant predictors:	B	*SE*	Wald's X^{2a}	*p*	Odds ratio
Trait anxiety worry	1.65	0.40	17. 35	< .001	5.21
Interpretation somatic (*n* = 130)	28.44	14	.012	.26	66.90
Significant predictors:	B	*SE*	Wald's X^{2a}	*p*	Odds ratio
Trait anxiety worry	0.70	0.25	7.80	.005	2.02
Team cohesion ATG-S	-0.55	0.27	43.21	.040	0.58
Interpretation cognitive (*n* = 123)	41.49	14	< .001	.38	72.45
Significant predictors:	B	*SE*	Wald's X^{2a}	*p*	Odds ratio
Trait anxiety worry	1.04	0.31	11.30	.001	2.82

Note. These results are based on the original version of Directional Modification of the Competitive State Anxiety Inventory-2 (Jones & Swain, 1992; Martens et al., 1990). I later recalculated analyses with the shortened version (Cox et al., 2003) and provide the respective results in the Appendix as an example of how influential measurement choice might be, in this case with regard to significance values. For precompetitive anxiety symptoms, the response-categories (1) were *higher intensity* and *more debilitative interpretation*; the reference-categories (0) were *lower intensity* and *more facilitative interpretation*, respectively. ATG-S = social Individual Attractions to the Group.

[a]*df* = 1 for all. [b]1 = away, 2 = home.

In sum, among all variables under investigation, competitive trait anxiety, particularly its worry dimension, was most consistently and strongly related to athletes' precompetitive anxiety response. Three other factors predicted precompetitive anxiety above and beyond what was accounted for by competitive trait anxiety. Among these, team cohesion, in the form of ATG-S, was the only other factor predicting symptom interpretation.

7.4 Implications

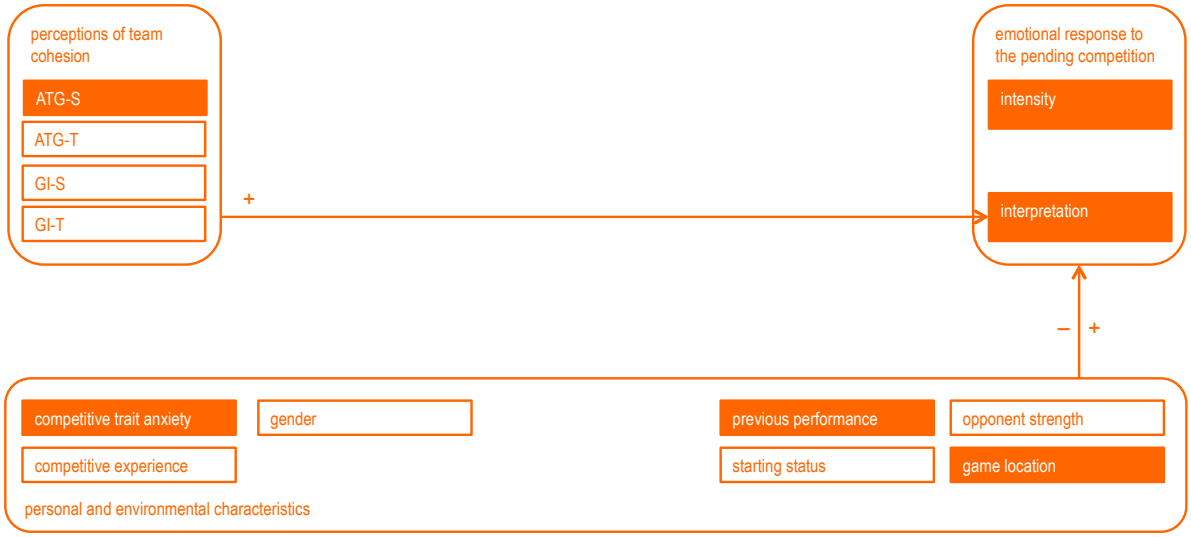

Figure 6. Schematic Representation of Results Pertaining to Study 1, Aim 1.
ATG-S = social Individual Attractions to the Group, ATG-T = task-related Individual Attractions to the Group, GI-S = social Group Integration, and GI-T = task-related Group Integration. Solid boxes mark significant variables and dimensions; solid lines indicate prediction.

As the first aim of Study 1, I investigated the relative importance of a selection of predictors with regard to athletes' anxiety response to a pending competition (for a schematic representation of the results, see Figure 6). The results demonstrated that athletes' levels of competitive trait anxiety (i.e., a personality component) contributed by far the most to both the intensity and interpretation of precompetitive anxiety symptoms. However, the level of team cohesion (i.e., a social component) had an effect above and beyond those of trait anxiety and the other predictors and thus justifies a continued focus.

The findings that competitive trait anxiety was relatively most important contradicts the work by Gould et al. (1984) who found competitive experience to have a greater relative effect than trait anxiety as it pertained to the intensity of precompetitive anxiety symptoms. However, the present results support theoretical suggestions (i.e., attentional bias theory; Calvo & Eysenck, 1998) and more recent findings (e.g., Cerin & Barnett, 2011; Ehrlenspiel et al., 2011) which posit that individuals with high trait anxiety are more prone to interpret a situation as threatening and exhibit more intense precompetitive anxiety symptoms. The strong and consistent links between competitive trait anxiety and the precompetitive anxiety response are hardly surprising considering that (a) competitive trait anxiety is "a predisposition to experience high anxiety states under conditions of threat" (Smith, Smoll, et al., 2006, p. 492); and (b) the precompetitive situation provides the potential for exactly those conditions (Cerin et al., 2000). Underlying differences in

competitive trait anxiety might also explain why some previously prominent predictors were of no relative importance to the precompetitive anxiety response in the present analyses. Individually, a male gender, a higher amount of competitive experience, and a starter status were found to predict a reduced intensity and more facilitative interpretations of precompetitive emotion symptoms (see Table 1). However, athletes with these characteristics were also found to posses lower levels of trait anxiety (Guillén & Sánchez, 2009) and once trait anxiety was included as a predictor, the formerly significant effects of these characteristics disappeared.

As it pertains to the other significant predictors of the precompetitive anxiety response in the present analyses, the results are generally in line with expectations and previous findings. That is, a home game location predicted a lower intensity of precompetitive anxiety symptoms, whereas a higher level of team cohesion predicted more facilitative symptom interpretations. More specifically, though, two interesting differences emerged between the current and previous results. First, in the present analyses, lower symptom intensity was unexpectedly predicted by a worse previous performance. An explanation might be that previous performance was operationalized as 'ranking' at the team level and not personal performance as has been the case in previous investigations (e.g., shooting percentage; Neil et al., 2012). For the individual athlete, ranking is merely an approximate measure of previous performance. A successful team outcome does not necessarily equal a successful personal performance and thus might provide less assurance with regard to future competitions (Chase, Feltz, & Lirgg, 2003). In contrast, being part of a more elite and higher status team might entail increased performance pressure (a) internally, because of a greater concentration of highly skilled athletes and thus greater competition for playing time; and (b) externally, because of greater (audience) expectations of continuing success (Wallace, Baumeister, & Vohs, 2005). The increased pressure might then result in higher perceived stakes and a higher intensity of anxiety symptoms prior to competitions (Cerin & Barnett, 2011).

A second difference in the present analyses was that the positive relationship between symptom interpretation and team cohesion was due to ATG-S and not primarily the task dimensions as previously found (see Table 2). In part, this may be due to pragmatic measurement issues in that the ATG-S dimension in prior investigations, as opposed to the present analyses, proved to be internally unreliable and could not be examined in relation to the precompetitive anxiety response. However, its negative link to precompetitive anxiety is perhaps not surprising. High ATG-S particularly reflects athletes' perceiving to have friends on their team as well as a positive social environment (Carron et al., 1985; Hardy, Eys, & Carron, 2005). Friendship and a positive social environment imply athletes helping and supporting each other in completing their (performance) task

(Bruner et al., 2014; Weiss, Smith, & Theeboom, 1996). In the context of an upcoming competition, belief in the availability of these kinds of resources would increase athletes' perceived prospects for successful goal attainment, either directly (Jones, Meijen, McCarthy, & Sheffield, 2009) or by way of enhanced self-efficacy (Rees & Freeman, 2009). This, in turn, would lead to more facilitative interpretations of precompetitive anxiety symptoms (Hale & Whitehouse, 1998; Williams, Cumming, & Balanos, 2010).

A task- and person-appropriate intensity of precompetitive anxiety symptoms and a facilitative symptom interpretation are desirable when it comes to athletes' optimal performance and adherence (e.g., Neil et al., 2012). In order to achieve such an adaptive precompetitive emotional response, effective and proactive regulation strategies are essential (Lane et al., 2012). However, the predictor that would promise the greatest relative effect, competitive trait anxiety, “refers to relatively stable individual differences in anxiety proneness” (Smith, Smoll, & Wiechman, 1998, p. 107) that may not be easy to modify and might require time-consuming, individualized interventions. In contrast, the cohesion-dimension of ATG-S, the only other predictor related to the interpretation of precompetitive anxiety symptoms, is more dynamic (Carron et al., 1998) and might present an efficient strategy to optimize an entire team's precompetitive emotional response at once.

Therefore, in terms of its potential to regulate athletes' precompetitive emotional response, team cohesion justifies and requires further study. Whereas the present set of analyses established the relative importance of cohesion, the mechanisms and reasons underpinning its relationship to the precompetitive emotional response are still unknown. Yet, such knowledge would be essential, for example, to design and implement effective interventions. An approach to explain how the precompetitive emotional response develops and how cohesion might influence this process is provided by cognitive-motivational-relational theory (Lazarus, 1999).

8. Cognitive-Motivational-Relational Theory of Emotion

8.1 Fundamental Assumptions

According to cognitive-motivational-relational theory (Lazarus e.g., 1999, 2000), emotions result from an individual cognitive appraisal process. This appraisal process relates persons to their environment and involves two main components (see Figure 7): *primary appraisal*, in which persons evaluate how important a situation (e.g., a pending competition) is to them personally, and *secondary appraisal*, in which persons evaluate whether they can live up to the situation's (e.g., the competition's) demands; that is, the perceived options and prospects for successful coping (Lazarus, 1999). Persons execute these appraisals simultaneously and perform three specific appraisal judgments for each (Lazarus, 1999). In the case of primary appraisal, they evaluate (a) which particular personal goal is involved in the situation (i.e., *type of ego-involvement*), (b) how important this goal is in relation to other personal goals (i.e., *goal relevance*), and (c) whether the situation promotes or hinders goal attainment (i.e., *goal congruence*). Therefore, primary appraisal is closely tied to the person's self-esteem, values, and the situation's potential for particular outcomes (e.g., winning a championship title, being cut from a team; Lazarus, 1999; Uphill & Jones, 2007). In the case of secondary appraisal, persons specifically evaluate (a) if they can control or are responsible for the outcome of the situation (i.e., *blame/credit*), (b) which internal or external resources they have to manage the situation's demands (i.e., *coping potential*), and (c) whether they expect the situation to end favorably or unfavorably for them (i.e., *future expectations*). Therefore, secondary appraisal is connected to the person's general locus of control, specific skills, and external support (Jones et al., 2009; Lazarus, 1999).

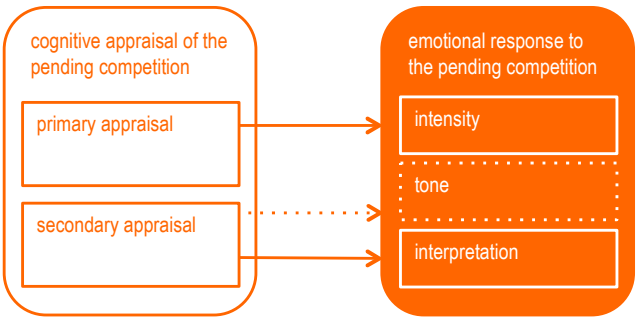

Figure 7. Relationships Between Components of Cognitive Appraisal and Dimensions of the Emotional Response as Specified by Cognitive-Motivational-Relational Theory and Previous Research.

Solid boxes mark the dissertation's central constructs; solid lines indicate prediction. When measuring the precompetitive anxiety response in Study 1, I assessed only intensity and interpretation, not emotional tone.

Taken together, primary and secondary appraisal[1] determine a person's general sense of loss or gain (Lazarus, 1999). In the context of an anticipated event such as a pending competition, this sense varies between *threat* (i.e., anticipated loss) and *challenge* (i.e., anticipated gain), as opposed to losses and gains that have occurred already (i.e., harm and benefit; Lazarus, 2000). Theoretically, four different constellations of precompetitive appraisal are possible: threat (i.e., a primary appraisal of high personal importance and a secondary appraisal of negative prospects for coping), challenge (i.e., a primary appraisal of high personal importance and a secondary appraisal of positive prospects for coping), tolerance (i.e., a primary appraisal of low personal importance and a secondary appraisal of negative prospects for coping), and boredom (i.e., a primary appraisal of low personal importance and a secondary appraisal of positive prospects for coping).

The different appraisal constellations then determine the dimensions of the emotional response (see Figure 7). Tolerance and boredom entail no emotional response because they are both characterized by a primary appraisal of low personal importance. Primary appraisal, that is, the personal importance of a situation, determines the intensity of the emotional response to the extent that persons only respond emotionally if they perceive something personal to be at stake (Lazarus, 1999; Siemer, Mauss, & Gross, 2007). Threat and challenge, on the other hand, are both characterized by a primary appraisal of high personal importance and consequently, both entail an emotional response. However, they differ with regard to secondary appraisal. Secondary appraisal, that is, the perceived prospects for coping with situational demands, determines the affective tone of the emotional response (Lazarus, 1999; Schmidt, Tinti, Levine, & Testa, 2010). In the context of a pending competition, a secondary appraisal of negative prospects for coping (i.e., a sense of threat) leads to precompetitive anxiety (Jones, Lane, Bray, Uphill, & Catlin, 2005; Nicholls, Polman, & Levy, 2012) and thus, likely decreases in performance (Englert & Bertrams, 2012). Conversely, a precompetitive primary appraisal of high personal importance and a secondary appraisal of positive prospects for coping (i.e., a sense of challenge) lead to precompetitive excitement (Jones et al., 2005; Nicholls, Polman, & Levy, 2012) and thus, likely increases in performance (Lane et al., 2010). In addition, a secondary appraisal of positive prospects for coping has also been empirically linked to more facilitative interpretations of the initial emotional symptoms (Hale & Whitehouse, 1998; Williams et al., 2010), potentially due to athletes being more likely to perceive a pleasant emotional tone as optimal (Robazza et al., 2008), which would increase performance as well (Neil et al., 2012).

[1] I refer to primary and secondary appraisal as the two components of cognitive appraisal, not the collection of specific appraisal judgments. Therefore, I treat them as singular (i.e., primary appraisal), rather than plural (i.e., primary appraisals).

8.2 Application of Cognitive-Motivational-Relational Theory in Sport

Cognitive-motivational-relational theory is the most commonly used framework for emotions in sport (Neil, Hanton, et al., 2013). For example, studies have supported the structure of individual appraisal judgments and their relation to perceptions of threat and challenge in female and male athletes from a range of sports and various competitive levels (Nicholls, Polman, & Levy, 2012; Thatcher & Day, 2008; Uphill & Jones, 2007), professional male rugby players (Nicholls et al., 2011), as well as elite male wheelchair basketball players (Campbell & Jones, 2002). These and other studies also support the causal link between cognitive appraisal and emotions in athletes (Neil et al., 2011; Nicholls et al., 2011; Nicholls, Polman, & Levy, 2012; Uphill & Jones, 2007) as well as soccer referees (Neil, Bayston, Hanton, & Wilson, 2013). Further, Neil, Hanton, and Mellalieu (2013) successfully used cognitive-motivational-relational theory as the guiding framework for a cognitive-behavioral intervention aimed at improving competitive male golfers' interpretations of their precompetitive emotional response and their subsequent performance.

In addition to these empirical adaptations, Fletcher and Fletcher (2005) developed a meta-model of stress, emotions and performance (see Figure 8) in which they integrated both the tenets of cognitive-motivational-relational theory (Lazarus, 1999) and the notion of further cognitive interpretation of the initial emotional response (Jones, 1991; Jones & Swain, 1992). However, the meta-model (see Figure 8) differs from original cognitive-motivational-relational theory in aspects such as the sequence of primary and secondary appraisal (which cognitive-motivational-relational theory considered to occur simultaneously) or the terminology of stressors (which cognitive-motivational-relational theory considered to always be the result of a subjective construal; Lazarus 1990, 1999).

Nonetheless, both cognitive-motivational-relational theory and the meta-model of stress, emotions and performance posit that the emotional response results from cognitive appraisal and that this appraisal may be moderated by social factors. For example, Lazarus and Folkman (1984) specify group structures, social networks, and social resources as possible antecedents of appraisal and the emotional response. More generally, Fletcher and Fletcher (2005) propose personal and situational characteristics to moderate all processes in their model (see Figure 8). Thus, when trying to explain how a team's level of cohesion relates to athletes' precompetitive emotional response, these models would suggest that cohesion operates as an antecedent or moderator of athletes' *precompetitive appraisal*, that is, their cognitive appraisal of the pending competition.

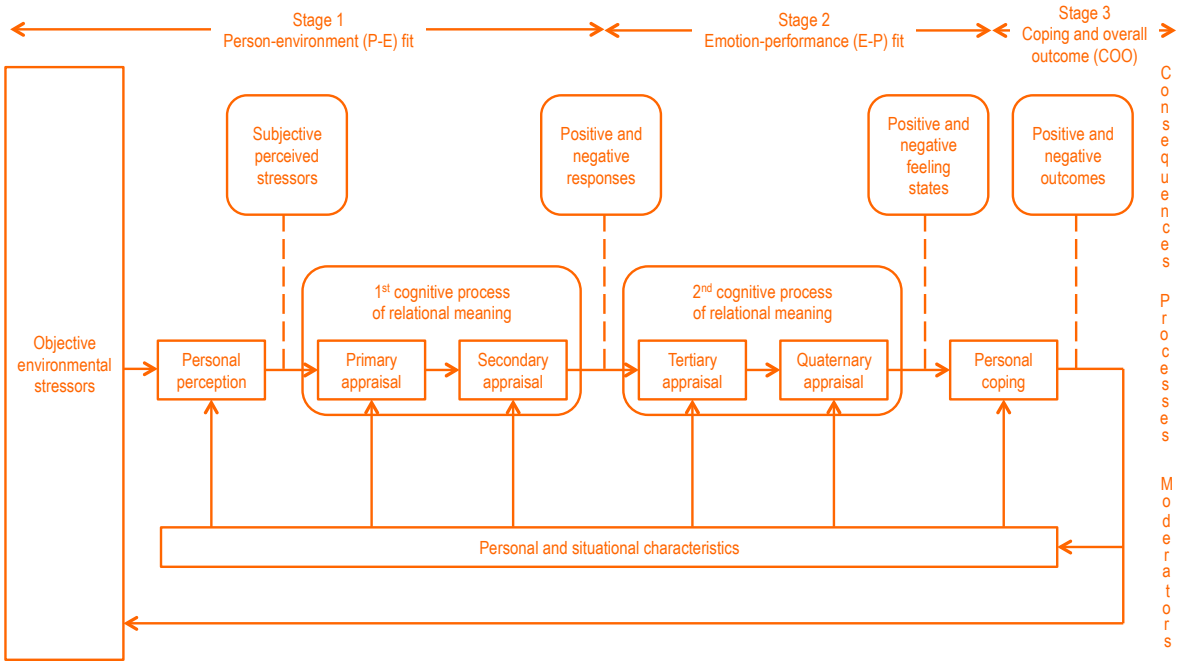

Figure 8. A Meta-Model of Stress, Emotions and Performance.

Adapted from "A meta-model of stress, emotions and performance: Conceptual foundations, theoretical framework, and research directions," by D. Fletcher and J. Fletcher, 2005, *Journal of Sports Sciences, 23*, p. 158.

8.3 Previous Research on Cognitive Appraisal and Cohesion

With one exception, none of the studies linking cohesion to the precompetitive emotional response have investigated possible mediating mechanisms and none have addressed precompetitive appraisal. Among the correlational studies (see Table 2), only Prapavessis and Carron (1996) explored if what they called the perceived psychological benefits (e.g., increased acceptance, support, and diffusion of responsibility for failure) and costs of cohesion (e.g., increased perceptions of responsibility for the team and pressure to fulfill norms and expectations) mediated its links to the intensity of precompetitive anxiety symptoms. They confirmed decreased psychological costs to explain the relationship between higher cohesion and lower symptom intensity. However, these costs represent somewhat arbitrarily chosen correlates of cohesion and not components of precompetitive appraisal as specified by cognitive-motivational-relational theory.

In contrast, two advances that have linked cohesion and cognitive appraisal stem from exercise and military psychology. For one, in their study of female college students participating in group aerobics classes, Gu, Solmon, Zhang, and Xiang (2011) found perceptions of higher ATG-S and GI-T to predict a greater personal importance of that class and perceptions of higher GI-S to

predict greater expectancies for personal success in the class. For another, in their organizing framework for relating cohesion to stress, strain, disintegration, and performance, Griffith and Vaitkus (1999) suggested that a higher level of unit cohesion would provide a social-psychological coping resource that is likely to positively affect soldiers' appraisal of stressful environmental events. Later, Griffith (2002) and Gilbar et al. (2010) empirically supported this suggestion by documenting that higher unit cohesion predicted perceptions of enhanced combat readiness respective more positive stress appraisals in the form of lower threat, higher challenge, increased control, and enhanced coping ability.

A potential explanation for the lack of studies focusing on team cohesion and athletes' appraisal in the context of a pending competition, one that also initially debilitated my research, might have been the lack of a valid measure to assess precompetitive appraisal.

9. Study 1, Aim 2: A Measure for Precompetitive Appraisal

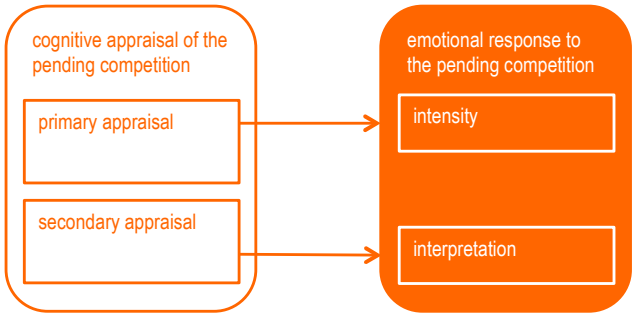

Figure 9. Schematic Representation of Study 1, Aim 2.
Solid boxes mark the dissertation's central constructs; solid lines indicate prediction.

A valid measure of precompetitive appraisal as based on cognitive-motivational-relational theory (Lazarus 1999, 2000) would need to fulfill multiple criteria. First, it would need to replicate cognitive-motivational-relational theory's two-factor structure and allow a distinction of athletes' precompetitive primary and secondary appraisal. Second, a valid measure of precompetitive appraisal would need to permit researchers to cluster athletes into specific precompetitive appraisal profiles and estimate their perceptions of threat, challenge, tolerance, or boredom. Third, such a measure would need to significantly predict scores on scales of the precompetitive emotional response. For example, primary appraisal scores should positively predict scores of emotional intensity and secondary appraisal scores should positively predict scores of the interpretation of emotion symptoms with regard to an upcoming performance. Secondary appraisal scores should also negatively predict intensity-scores for the cognitive emotion component because empirical evidence (e.g., Hanton, Mellalieu, & Young, 2002; Williams, Frank, & Lester, 2000) suggests that aspects of a secondary appraisal of positive prospects for coping (e.g., high estimated probability of success, positive performance expectations) relate to a lower extent and frequency of emotion-related thoughts. In addition, a useful measure of precompetitive appraisal would have to be concise so it can be administered within a precompetitive situation without disrupting athletes' precompetitive routines and/or included as part of other research protocols without unnecessarily inflating testing procedures (cf. Thomas, Hanton, & Jones, 2002).

Unfortunately, existing measures of general and precompetitive appraisal do not always fulfill these criteria. They tend to assess an overall sense of threat or challenge and offer no information on primary and secondary appraisal or the individual appraisal judgments (Cerin, 2003; Dugdale, Eklund, & Gordon, 2002). Alternatively, existing measures focus exclusively on selected

judgments (e.g., expected outcome, Abella & Heslin, 1989; coping options, Folkman et al., 1986). Further, existing measures of appraisal partially confound cognitive appraisal with related concepts (e.g., actual coping behavior instead of coping expectations, Folkman & Lazarus, 1985; Podlog & Eklund, 2010; Smith & Lazarus, 1993; the ensuing emotional response, Anshel et al., 2001; Peacock & Wong, 1990; Williams & Cumming, 2012). Finally, many of the existing measures, while effective and valid in their own right, do not readily extend to precompetitive situations because they either stem from clinical psychology (e.g., Gall & Evans, 1987), focus on stable personality traits (e.g., Roesch & Rowley, 2005), or apply to specific sport or even non-sport conditions (e.g., recovery from injury; Daly, Brewer, Van Raalte, Petitpas, & Sklar, 1995; a job-interview, Gaab, Rohleder, Nater, & Ehlert, 2005).

However, a valid measure of precompetitive appraisal is essential to illuminate the development and potential regulation of the precompetitive emotional response (Cerin, 2003; Uphill & Jones, 2007). Specifically, it is essential to explain how athletes' perceptions of team cohesion relate to their precompetitive emotional response, that is, if cohesion operates as an antecedent or moderator of athletes' precompetitive appraisal.

9.1 Research Aim and Hypotheses

As the second step in my dissertation and the second aim of Study 1, I developed and initially validated a novel measure of precompetitive appraisal. The goal was for it to (a) fit the theoretically proposed two-factor structure of primary and secondary appraisal, (b) distinguish theoretically congruent appraisal profiles (e.g., threat and challenge), and (c) predict the intensity and interpretation of precompetitive anxiety symptoms, as representative dimensions of the precompetitive emotional response, in line with theoretical and empirical suggestions. Specifically, I hypothesized that a primary appraisal of higher personal importance would predict higher symptom intensity and a secondary appraisal of more positive prospects for coping would predict more facilitative symptom interpretations as well as lower cognitive symptom intensity.

9.2 Specific Methods

Item Generation

As the first step in constructing a measure of precompetitive appraisal, I decided to modify the response items developed by Podlog and Eklund (2010). These were successfully employed to assess team sport athletes' appraisals upon returning from injury and thus deemed to provide an

appropriate basis for item-formulation. In this process, I followed a construct-based strategy (Smith, Smoll, et al. 2006). As part of this, I discarded four items because they addressed overall appraisal and coping behavior instead of individual appraisal judgments according to cognitive-motivational-relational theory (Lazarus, 1999). I rephrased the remaining six items so that statements referred to a precompetitive situation (i.e., “the upcoming competition”). In addition, I introduced new statements to ensure all relevant individual appraisal judgments were represented. As has been done in other studies (Cerin & Barnett, 2011; Smith & Lazarus, 1993), I decided to exclude the primary appraisal judgment of *type of ego-involvement* from the questionnaire. Whereas the precise personal goal is necessary to elucidate *why* athletes perceive a competition as important (cf. Dugdale et al., 2002; Neil et al., 2011), a standardized assessment of these diverse and personal aspects would be challenging. Type of ego-involvement would require a more in-depth and individual inquiry than a brief quantitative measure of precompetitive appraisal could provide. Finally, I kept the rating scale at a 9-point Likert-type version to facilitate sufficient variance in the answers (Dawes, 2002), but I standardized it to range from 1 = *strongly disagree* to 9 = *strongly agree*.

Expert Review

In a second step and as a first indication of the new measure's validity in terms of test content (Vaughn & Daniel, 2012), I presented the selection of statements to a team of researchers which evaluated each of the items with regard to its content-validity (i.e., whether it captured the respective appraisal judgment correctly) and comprehensibility (i.e., whether the intended population of intercollegiate athletes would be able to understand its meaning). The members of the research team were particularly well suited for this process, given that they were knowledgeable in cognitive-motivational-relational theory and questionnaire development, and had experience engaging with intercollegiate athletes. The research team discussed and adapted the items until both criteria were fulfilled. The resultant seven-item *Precompetitive Appraisal Measure* (*PAM*) contained three primary and four secondary appraisal items (see Table 5). The instructions for athletes read as follows: "The following statements ask about the thoughts and feelings you are having about the upcoming competition *right now*. Please circle the appropriate number to the right of each statement to indicate *to what extent you agree with this statement*."

Athlete Responses

In a third step, I collected athletes' responses to the seven-item PAM as part of Study 1 (see Chapter 4.1), that is, directly in the context of a precompetitive situation. Athletes responded to the PAM immediately prior to the Directional Modification of the Competitive State Anxiety Inventory-2

(CSAI-2D). The CSAI-2D provides a clear distinction of the perceived intensity and interpretation of precompetitive anxiety symptoms which is vital to establish the PAM's predictive validity as primary and secondary appraisal were expected to relate to these components differently (Hale & Whitehouse, 1998; Williams et al., 2010).

9.3 Analyses and Results

The PAM's final item selection as well as descriptive statistics of athletes' precompetitive appraisal and dimensions of the precompetitive anxiety response is displayed in Table 5.

Factor Structure

In addition to examining its items, further evidence of a new measure's initial validity stems from its internal structure (Vaughn & Daniel, 2012). To test the fit of the obtained data to the proposed two-factor structure of the PAM, I conducted both a Principal Components Analysis (PCA, inductive approach) and a Confirmatory Factor Analysis (CFA, deductive approach). Combining these two types of analyses is recommended and was done to provide greater credibility with regard to the resultant solution (Vaughn & Daniel, 2012). Because these analyses should not be performed on the same sample (Smith, Smoll, et al. 2006), I randomly split the present data into subsets of 185 (*Sample 1*) and 199 (*Sample 2*) athletes, respectively. Although reduced, the sample size can still be considered fair based on the participant-item ratio exceeding the minimum 5:1 (MacCallum, Widaman, Zhang, & Hong, 1999) and the expectation of few, distinct factors with all variables loading highly (> .80) in the solution (see Table 5; Comrey & Lee, 1992; Tabachnick & Fidell, 2007). A one-way ANOVA and several chi-squared tests indicated no significant demographic differences between the two samples. Subsequently, I performed a PCA with oblique rotation on Sample 1 to explore which number of components best summarized the seven individual appraisal items. I chose PCA over Exploratory Factor Analysis because at this point I desired merely an empirical summary of the data, not any test of underlying constructs. I chose oblique rotation ($\delta = 0$ allowing for a fairly high correlation between components) to polarize correlations between variables and components in the solution and because I expected primary and secondary appraisal to correlate (cf. Peacock & Wong, 1990). Finally, I conducted a CFA on Sample 2 using IBM SPSS Amos statistical software to test how well the theoretically proposed two-factor model (see Table 5) fit to the data. Again, I allowed factors to correlate (but individual items and errors were not) and estimated fit by using Maximum Likelihood techniques.

Table 5. PAM's Final Item Selection (Corresponding Appraisal Judgments in Parentheses) and PCA-Component Loadings, Mean Scores, and Skewness of Athletes' Precompetitive Appraisal and Precompetitive Anxiety Response as Pertaining to Study 1, Aim 2.

Variable	*M*	*SD*	Scale	Skewness[a]	Loadings PCA-component[b] 1	2
Precompetitive appraisal:						
Primary Appraisal[c]	8.02	1.06	1 to 9	-1.05		
1. The upcoming competition is important to me. (goal relevance)	8.28	1.24	1 to 9	-2.46	.77	.17
2. In the upcoming competition, there is a lot at stake. (goal relevance)	7.51	1.79	1 to 9	-1.29	.88	-.16
3. The upcoming competition is desirable to me. (goal congruence)	8.09	1.19	1 to 9	-1.53	.81	.17
Secondary Appraisal (proposed model)[d]	7.00	1.56	1 to 9	-0.89		
Secondary Appraisal (modified model)[e]	6.74	1.81	1 to 9	-0.89		
4. I'm in control of the upcoming competition. (blame/credit)	6.63	2.30	1 to 9	-1.02	-.01	.84
5. I'm responsible for the upcoming competition. (blame/credit)	6.37	2.36	1 to 9	-0.82	.06	.78
6. I have the resources to cope with the upcoming competition.[f] (coping potential)	7.80	1.43	1 to 9	-1.67	.08	.68
7. The upcoming competition is likely to result in a positive outcome for me. (future expectations)	7.22	1.70	1 to 9	-1.05	-.07	.80
Precompetitive anxiety response:						
Intensity somatic	1.67	0.50	1 to 4	0.79		
Intensity cognitive	2.05	0.62	1 to 4	0.65		
Interpretation somatic	0.70	1.14	-3 to +3	0.17		
Interpretation cognitive	0.37	1.18	-3 to +3	0.31		

Note. $N = 384$ for all, except for Primary Appraisal ($N = 379$) and intensity somatic ($N = 381$).

[a]*S.E.* = 0.13. [b]Results of the pattern matrix. [c]Mean of the three individual items. [d]Mean of the four individual items. [e]Mean of the three individual items without coping potential. [f]The item was dropped from the questionnaire's final version.

According to Tabachnick and Fidell (2007), the number of components that best summarizes a set of variables in PCA can be identified by counting either the number of components whose Eigenvalues exceed 1 or the point in the Screeplot where the line drawn through the components' Eigenvalues changes slope. In the present analyses, both criteria showed a coherent picture, indicating the empirical data was best summarized by two components with Eigenvalues of 3.46 and 1.21, respectively, and the Screeplot-line changing slope following component 2. The two components were moderately correlated with r = .41 and each comprised the expected PAM-items with very good to excellent loadings (Comrey & Lee, 1992; see Table 5).

With regard to the CFA, Hu and Bentler (1999) suggest estimating model-fit via the standardized root mean square residual (SRMR) and a comparative fit index such as the comparative fit index (CFI). Whereas probability levels pertaining to the X^2 value are likely to be inaccurate in small samples (Tabachnick & Fidell, 2007), a good-fitting model would be indicated by a SRMR below .08 (the smaller, the better) and a CFI above .95 (the greater, the better; Hu & Bentler, 1999). For the initially proposed model these indices indicated a poor fit to the data ($X^2$13 = 55.82, p < .001, SRMR = .07, CFI = .92; internal consistencies α = .75 for Primary Appraisal, α = .80 for Secondary Appraisal). Upon inspection, modification indices showed the secondary appraisal item “I have the resources to cope with the upcoming competition.” was particularly low on regression weights and would be better represented as part of the primary appraisal subscale. Switching a secondary appraisal judgment to primary appraisal, however, would run counter to cognitive-motivational-relational theory. In addition, the same item was also comparatively low on loadings in the PCA (see Table 5). Consequently, in line with procedures employed by Williams and Cumming (2012), I re-specified the model by removing the item and re-estimated model fit. The fit of the resulting six item two-factor model was much improved (X^2_8 = 16.82, p = .032, SRMR = .04, CFI = .98; internal consistencies α = .75 for Primary Appraisal, α = .80 for Secondary Appraisal). As a third alternative, I tested a model with all seven items loading on one overall appraisal-factor and found it to perform worse than both the proposed and the modified model (X^2_{14} = 173.38, p < .001, SRMR = .11, CFI = .71; internal consistency α = .81). Thus, I retained the modified model and used it in all further analyses.

Appraisal Profiles

As further evidence for its initial validity in terms of test content, I tested how well the PAM distinguished theoretically congruent appraisal profiles. To this end, I standardized all scores on the Primary and Secondary Appraisal subscales (i.e., the data of both subsamples). Following, on the

standardized subscales, I conducted a hierarchical cluster analysis with Ward's method of linkage and Squared Euclidean distance to determine the appropriate number of clusters. Finally, I validated the cluster solution via a K-means non-hierarchical cluster analysis.

Results of both the hierarchical and the K-means non-hierarchical cluster analysis indicated the sample's precompetitive appraisal responses were best represented by a two-cluster solution. As displayed in Figure 10, these clusters were one of relatively high personal importance (cf. primary appraisal) and relatively negative prospects for coping (cf. secondary appraisal; labeled *Threat*) and one of relatively high personal importance (cf. primary appraisal) and relatively positive prospects for coping (cf. secondary appraisal; labeled *Challenge*). The classification was supported by a discriminant analysis in which scores on Primary and Secondary Appraisal classified 99.70% of athletes correctly into their respective profiles of Threat and Challenge (Wilks' $\lambda = .31$, $X^2_2 = 762.09$, $p < .001$).

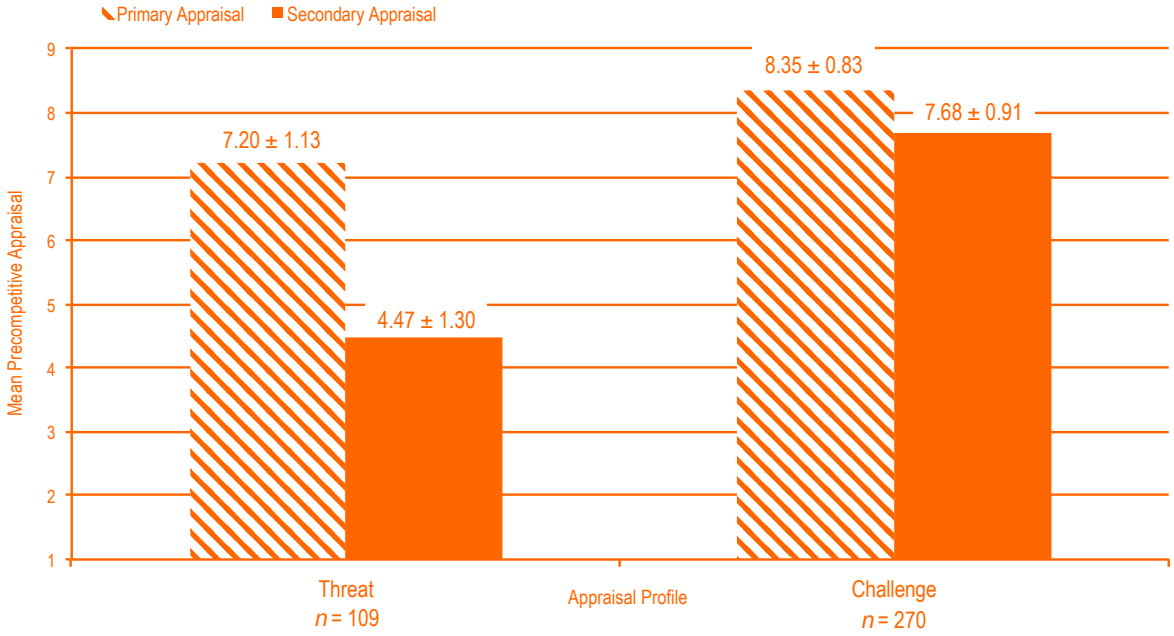

Figure 10. Results of Cluster Analysis and Distribution of Athletes Across Appraisal Profiles.
Primary Appraisal represents the personal importance of the pending competition; Secondary Appraisal represents the perceived prospects for coping with competitive demands (Lazarus, 2000).

Prediction of Emotional Response Dimensions

Finally, to examine the PAM's validity in terms of its relationships to other variables (i.e., the intensity and interpretation of precompetitive anxiety symptoms), I conducted a follow-up MANOVA to test for differences between the resultant precompetitive appraisal profiles and I performed multiple regression analyses with each of the four response dimensions (intensity and interpretation

of somatic and cognitive symptoms) as dependent variables and the precompetitive appraisal subscales as independent variables.

In line with initial expectations, results of the MANOVA revealed differences between Threat and Challenge appraisal profiles for interpretation of cognitive anxiety symptoms ($F_{1, 377}$ = 8.43, p = .004) with precompetitive anxiety symptoms being interpreted as more facilitative for athletes exhibiting a Challenge appraisal (M = 0.48, SD = 1.19; Threat appraisal M = 0.10, SD = 1.11). Regression analyses (see Table 6) supported this finding in that precompetitive appraisal significantly predicted precompetitive symptom intensity and interpretation of cognitive anxiety symptoms. Although the amount of variance accounted for was small (r^2 ranging from .01 to .04), these results were in line with initial expectations. Specifically, scores on Primary Appraisal positively predicted symptom intensity, whereas scores on Secondary Appraisal positively predicted symptom interpretation, and inversely predicted cognitive symptom intensity.

Table 6. Results of Regression Analyses Predicting Athletes' Precompetitive Anxiety Response from Their Precompetitive Appraisal.

Precompetitive anxiety response		r^2	p	95% CI
Intensity somatic		.02	.019	[-0.008, 0.05]
	Predictors:	β	p	95% CI
	Primary Appraisal	.16	.005	[0.02, 0.13]
	Secondary Appraisal[a]	-.09	.128	[-0.06, 0.01]
Intensity cognitive		.03	.005	[-0.004, 0.06]
	Predictors:	β	p	95% CI
	Primary Appraisal	.11	.061	[-0.003, 0.13]
	Secondary Appraisal	-.18	.001	[-0.10, -0.02]
Interpretation somatic		.01	.065	[-0.01, 0.03]
	Predictors:	β	p	95% CI
	Primary Appraisal	-.01	.851	[-0.13, 0.11]
	Secondary Appraisal	.12	.029	[0.01, 0.15]
Interpretation cognitive		.04	< .001	[0.002, 0.08]
	Predictors:	β	p	95% CI
	Primary Appraisal	.02	.736	[-0.10, 0.14]
	Secondary Appraisal	.20	< .001	[0.06, 0.20]

Note. Regression results for Secondary Appraisal including coping potential (i.e., the proposed model) were as follows: intensity somatic r^2 = .03, p = .007, 95% CI = [-0.004, 0.06]; intensity cognitive r^2 = .03, p = .001, 95% CI = [-0.004, 0.06]; interpretation somatic r^2 = .02, p = .032, 95% CI = [-0.008, 0.05]; interpretation cognitive r^2 = .05, p < .001, 95% CI = [0.008, 0.09].

[a]Mean of the three individual items without coping potential (i.e., the modified model).

9.4 Implications

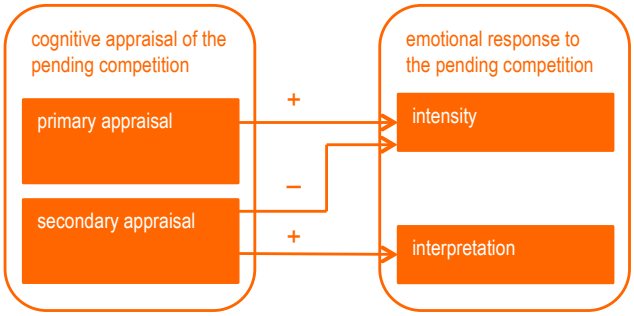

Figure 11. Schematic Representation of Results Pertaining to Study 1, Aim 2.
Solid boxes mark significant dimensions; solid lines indicate prediction.

As the second aim of Study 1, I introduced and provided initial evidence for the validity of the Precompetitive Appraisal Measure (PAM; see Appendix). The PAM's items were found to be congruent with cognitive-motivational-relational theory and, after removing the item for coping potential, fit the two-factor structure of primary and secondary appraisal. I was also able to determine threat and challenge appraisal profiles from athletes' responses and these responses predicted the intensity and interpretations of precompetitive anxiety symptoms as representative dimensions of the precompetitive emotional response, albeit weakly, but in line with theory and previous research (e.g., Lazarus, 1999; Williams et al., 2010; for a schematic representation of the results, see Figure 11). In addition, the PAM is brief enough to be administered without disrupting precompetitive routines or inflating testing procedures.

Besides hoping to provide validity support for a useful tool for future research, the present analyses offer interesting insights into how well empirical data actually replicates cognitive-motivational-relational theory. First, the omission of the judgment of coping potential (i.e., item 6) warrants some further discussion. In theory, the item is thought to be a component of secondary appraisal (Lazarus, 1999). Yet, its omission is in line with other studies (e.g., Cerin & Barnett, 2011) and both of my factorial analyses showed that it did not fit with the other secondary appraisal items – which were sufficient to determine appraisal profiles and predict the precompetitive emotional response. In describing the limitations of item 6, it is plausible that the precise kinds of available resources are too manifold and personal to be captured as part of a standardized quantitative measure of precompetitive appraisal. However, these resources can be expected to influence athletes' perceptions of control and anticipated outcomes and thus be included in these appraisal judgments (e.g., higher external support leading to greater situational control; Freeman & Rees, 2009).

Second, the distinction of two specific precompetitive appraisal profiles should be considered at greater depth. In theory, four types of appraisal are possible with regard to an upcoming competition (i.e., threat, challenge, tolerance, or boredom; Lazarus, 1999). Instead of querying them directly, the PAM offers the possibility of inferring these perceptions from different constellations of precompetitive primary and secondary appraisal. However, out of the four possible types of precompetitive appraisal, the current sample displayed only those of threat (i.e., anticipated loss) and challenge (i.e., anticipated gain; see Figure 10). As reflected by the high negative skew and low variation in primary appraisal responses (see Table 5), competitive intercollegiate athletes appear to generally perceive their pending competitions as personally relevant. This is not surprising considering how strongly this population identifies with being a student-athlete (Lally & Kerr, 2005), or the personal benefits that are attached to successful athletic performance (Dunn, Causgrove Dunn, & McDonald, 2012). Fortunately, the majority also reports a secondary appraisal of relatively positive prospects for coping (i.e., a challenge appraisal), as indicated by previous findings (Cerin & Barnett, 2011; Nicholls, Polman, & Levy, 2012) and reflected by the present distribution of athletes across appraisal profiles (see Figure 10). This can be expected to result in a more positively toned emotional response (Williams & Cumming, 2012) and coincide with more facilitative interpretations of emotion symptoms (Williams et al., 2010). Such characteristics would then lead to more adaptive cognitive states (Isen, 2009), increased effort (Tomaka et al., 1993), and enhance subsequent performance (Neil et al., 2012).

Although its validity evidence is only preliminary and affords some limitations, the PAM constitutes a much-needed advance in measurement. One limitation is the PAM's low associations with scores of the precompetitive emotional response (see Table 6), However, these might be explained by the restricted variance in PAM-values (see Table 5; Dawes, 2002) or a general mismatch between cognitive-motivational-relational theory and empirical data as has been reported before (e.g., Cerin & Barnett, 2011; Hulbert-Williams, Morrison, Wilkinson, & Neal, 2013). Another limitation is that I tailored the final two-factor model to empirical indicators. However, this process was informed and supported by theory (e.g., Freeman & Rees, 2009; Lazarus, 1999). Thus, in summary, the present analyses provided the necessary support to use the PAM further and allowed me to proceed to my next aim, the explanation of the relationships between team cohesion and the precompetitive emotional response.

10. Team Cohesion and Precompetitive Appraisal

As reviewed above, perceptions of team cohesion were found to relate to the precompetitive emotional response in a variety of samples (see Chapter 5.2.2). Further, both general (Lazarus & Folkman, 1984) and sport-specific models of emotion (Fletcher & Fletcher, 2005) suggest that cohesion operates through athletes' precompetitive appraisal. As initial support for this suggestion, higher cohesion was linked to greater personal importance and expectancies for success in female aerobics class participants (Gu et al., 2011) as well as soldiers' more positive prospects for coping with stressful environmental demands (Gilbar et al., 2010; Griffith, 2002). Along these same lines, it is plausible, that the level of cohesion of a sport team relates to athletes' cognitive appraisal of a pending competition.

10.1 Plausible Links to Precompetitive Primary Appraisal

With regard to precompetitive primary appraisal, that is, the personal importance of a pending competition, a high level of cohesion could operate in two directions. On the one hand, higher cohesion could lead to a precompetitive primary appraisal of *decreased* personal importance. On a theoretical level, the definition and conceptualization of cohesion (see Chapter 5.2.1) incorporates aspects of athlete friendship (Hardy et al., 2005; Weiss et al., 1996), emotional and esteem support (Griffith & Vaitkus, 1999; Martin, Carron, Eys, & Loughead, 2013). On an empirical level, higher cohesion was found to coincide with reduced peer-pressure and criticism (Hill & Shaw, 2013; Prapavessis & Carron, 1996), shared responsibility for failure (Brawley et al., 1987; Schlenker & Miller, 1977), and again, greater emotional and esteem support (Christensen, Schmidt, Budtz-Jørgensen, & Avlund, 2006; Prapavessis & Carron, 1996). With these characteristics, higher cohesion would help athletes to separate their self-worth from potential success or failure (Kjørmo & Halvari, 2002) and reduce their need to impress important others (Christensen et al., 2006) or protect their self-esteem (Weiss et al., 1996), which would decrease the importance of a successful competitive outcome (Freeman & Rees, 2009). In addition, a higher level of cohesion would reduce the potential for repercussions (Hill & Shaw, 2013) and thus, the importance of a good performance to avoid these (Hill & Shaw, 2013; Prapavessis & Carron, 1996). That is, a higher level of cohesion would lead to a precompetitive primary appraisal of decreased personal importance and ultimately a decreased intensity of the precompetitive emotional response (cf. Lazarus, 1999; Uphill & Jones, 2007).

On the other hand, higher cohesion could lead to a precompetitive primary appraisal of *increased* personal importance. On a theoretical level, the definition of cohesion also includes a sense of collectivity (Carron et al., 1998; Terry et al., 2000), interpersonal attraction (Carron et al., 1998; Karau & Hart, 1998), and athlete identification (Allen, Coffee, & Greenlees, 2012; Hüffmeier & Hertel, 2011). On an empirical level, these links are supported by findings that relate higher cohesion to perceptions of greater interdependence (Chen, Tang, & Wang, 2009; Kerr, Seok, Poulsen, Harris, & Messé, 2008), increased responsibility for teammates (Hardy et al., 2005; Hill & Shaw, 2013), and again, stronger identification (Bruner et al., 2014; De Backer et al., 2011). With these characteristics, a higher level of cohesion would enhance the personal relevance of team outcomes (Brewer & Gardner, 1996), make athletes feel their contributions to such tasks are indispensible (Hüffmeier & Hertel, 2011), and heighten their concerns about disappointing or letting down highly valued teammates (Hardy et al., 2005), all of which would increase the pressure for them to perform well in a pending competition (Gockel, Kerr, Seok, & Harris, 2008; Hill & Shaw, 2013; Van Dick, Tissington, & Hertel, 2009). That is, a higher level of cohesion would lead to a precompetitive primary appraisal of increased personal importance and ultimately an increased intensity of the precompetitive emotional response (cf. Lazarus, 1999; Uphill & Jones, 2007).

10.2 Plausible Links to Precompetitive Secondary Appraisal

With regard to precompetitive secondary appraisal, that is, the perceived prospects for coping with situational demands, a high level of cohesion can be expected to operate mainly in a positive way. On a theoretical level, cohesion shows strong overlap with constructs such as teamwork (Karreman, Riemer, & Harenberg, 2011; Landers, Wilkinson, Hatfield, & Barber, 1982), informational and tangible support (Griffith & Vaitkus, 1999). On an empirical level, higher cohesion is related to more prosocial behavior (Bruner et al., 2014; Tamminen & Crocker, 2013) and again, greater teamwork (Brawley et al., 1987; Karreman et al., 2011), informational and tangible support (Christensen et al., 2006; Courneya & McAuley, 1995). With these characteristics, a higher level of cohesion would enable athletes' self-efficacy (Rees & Freeman, 2009), enhance their sense of control (Freeman & Rees, 2009) and available resources (Griffith & Vaitkus, 1999), which would increase their perceived prospects for mastering the demands of a pending competition (Freeman & Rees, 2009; Jones et al., 2009; Williams et al., 2010). That is, a higher level of cohesion would lead to a precompetitive secondary appraisal of more positive prospects for coping and ultimately a more

pleasant tone and more facilitative interpretations of the precompetitive emotional response (Nicholls, Polman, & Levy, 2012; Williams et al., 2010).

10.3 Gender as a Plausible Moderator

In addition to the tenability of a general relationship between cohesion and precompetitive appraisal, it is also plausible, that some athletes would pay more attention to the psychosocial quality of their team than others. A fundamental and likely moderating characteristic in this context is athletes' gender. For example, females as compared to males seem to place greater emphasis on social factors such as cohesion, social and peer support in relation to performance (Carron, Colman, Wheeler, & Stevens, 2002), sport-confidence (Vealey, Walter Hayashi, Garner-Holman, & Giacobbi, 1998), and adherence (Duncan, Duncan, & McAuley, 1993). Therefore, female as compared to male athletes might also more strongly consider their team's level of cohesion when appraising a pending team competition.

11. Study 1, Aim 3: Relating Team Cohesion to Precompetitive Appraisal

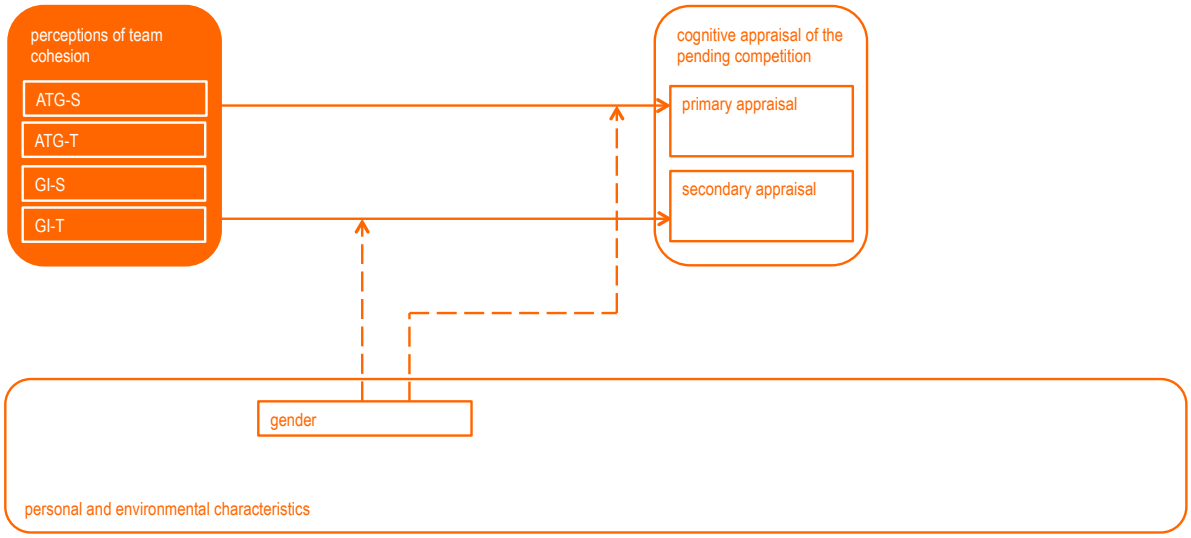

Figure 12. Schematic Representation of Study 1, Aim 3.

ATG-S = social Individual Attractions to the Group, ATG-T = task-related Individual Attractions to the Group, GI-S = social Group Integration, and GI-T = task-related Group Integration. Solid boxes mark the dissertation's central constructs; solid lines indicate prediction, dashed lines moderation.

A higher level of team cohesion was found to predict a precompetitive emotional response that is more adaptive to performance, health, and adherence (see Table 2; e.g., Ivarsson & Johnson, 2010; Neil et al., 2012). Therefore and due to its innate characteristics, cohesion might provide an apt approach to effective emotion regulation (see Chapter 5.2.3). I already established that cohesion justifies further study because it has a unique effect on the precompetitive emotional response (see Chapter 7). The next step would be to establish through which mechanisms cohesion operates, so that its likely adaptive effects can be explained and purposefully employed.

11.1 Research Aim and Hypotheses

As the third step in my dissertation and the third and final aim of Study 1, I followed suggestions from emotion models and theory (Fletcher & Fletcher, 2005; Lazarus, 1999) and tested if team cohesion operates as a predictor of athletes' precompetitive appraisal. Based on theoretical assumptions and previous empirical findings I hypothesized that (a) athletes' perceptions of team cohesion would predict their precompetitive primary appraisal (i.e., the personal importance of the pending competition), either in a decreasing or increasing direction; (b) athletes' perceptions of higher cohesion would predict their precompetitive secondary appraisal of more positive prospects

for coping with competitive demands; and (c) both relationships would be stronger for female athletes.

11.2 Analyses and Results

The present set of analyses, too, was based on Study 1 as described in Chapter 4.1. Among the variables measured, relevant for the present set of analyses were team cohesion (as assessed with the Group Environment Questionnaire) and precompetitive appraisal (as assessed with the newly developed and validated Precompetitive Appraisal Measure). Descriptive values for these variables are displayed in Table 7.

Table 7. Mean Scores and Bivariate Correlations for Athletes' Perceptions of Team Cohesion and Precompetitive Appraisal as Pertaining to Study 1, Aim 3.

Variable	*M*	*SD*	Scale	2.	3.	4.	5.	6.
Team cohesion:								
1. ATG-S	7.48	1.24	1 to 9	.40**	.48**	.40**	.29**	.22**
2. ATG-T	6.87	1.42	1 to 9	–	.45**	.59**	.33**	.36**
3. GI-S	6.90	1.38	1 to 9		–	.60**	.18**	.08
4. GI-T	6.60	1.41	1 to 9			–	.29**	.12*
Precompetitive appraisal:								
5. Primary Appraisal	7.98	1.13	1 to 9				–	.48**
6. Secondary Appraisal	6.71	1.83	1 to 9					–

Note. *N* ranging from 382 (Primary Appraisal) to 386 (GI-T and Secondary Appraisal). ATG-S = social Individual Attractions to the Group, ATG-T = task-related Individual Attractions to the Group, GI-S = social Group Integration, GI-T = task-related Group Integration.

*$p < .05$. **$p < .01$

All participants in my first study were part of intact teams and as such nested in the same social and environmental context as their teammates. Such a common context might cause members of one team to converge in their perceptions and evaluations (Allen et al., 2012; Bickel, 2007). Whereas I did not pay any attention to these effects before, as a first step in my present analyses, I tested if the nesting structure had caused any team-related dependencies in the dependent variable, that is, athletes' precompetitive appraisal. For precompetitive primary appraisal I found a significant intraclass correlation, $r = .114$, $p = .020$, indicating that 11.40% of variance in precompetitive primary appraisal could be explained by team-membership alone. As a consequence, when predicting primary appraisal, I used restricted maximum likelihood estimators that permitted intercepts and slopes to vary from team to team and introduced contextual variables to account for

the team-related dependencies (cf. Bickel, 2007). In contrast, for precompetitive secondary appraisal, I found no team-related dependencies, r = .00. Thus, when predicting secondary appraisal, I proceeded with ordinary least squares (OLS) estimators, which assume intercepts and slope to be the same across all teams.

Relationships to Precompetitive Primary Appraisal

Multilevel regression. I specified the first model to include precompetitive primary appraisal as the criterion variable, a random intercept (allowing primary appraisal ratings to vary across teams), the four dimensions of cohesion as individual level predictors with random slopes (allowing the relationships between the dimension and primary appraisal to vary across teams), as well as three team level predictors with fixed slopes (as there was no further level across which they could have varied). These team level predictors were previous performance (i.e., own ranking), opponent strength (i.e., opponent ranking), and game location (i.e., dichotomous score of *home* vs. *away*). All of these predictors were found to relate to the intensity of the precompetitive emotional response or precompetitive primary appraisal directly (e.g., Hill & Shaw, 2013; see Table 1) and can be assumed to distinguish members of one team. To make coefficients more interpretable and avoid multicollinearity when cross-level interactions would be included, I initially centered the four dimensions of cohesion, previous performance, opponent strength, and game location with regard to their grand mean (i.e., I subtracted the respective grand mean from each athlete's score on that variable; Bickel, 2007). I then ran the specified multilevel regression and calculated R^2 (with all slopes fixed) as well as the conditional intraclass correlation (with the random intercept and team level predictors, only).

Together, dimensions of cohesion and team level predictors explained 32.29% of variance in precompetitive primary appraisal, -2 log likelihood = 872.88, Akaike's Information Criterion (AIC) = 884.88, Schwarz's Bayesian Criterion (BIC) = 907.45. As Table 8 shows, higher task cohesion (i.e., ATG-T and GI-T), better previous performance, and a weaker opponent predicted a primary appraisal of the higher personal importance of a pending competition. As indicated by non-significant random slope components (see Table 8), the effect of cohesion was the same across all teams. Further, I found team level predictors to support expectations and explain the differences in primary appraisal between teams, as indicated by a non-significant conditional intraclass correlation, ΔICC = -.007 (see Table 8; cf. Bickel, 2007).

Table 8. Results of Multilevel Regression and Multilevel Moderation Analyses with Precompetitive Primary Appraisal as the Criterion Variable in Study 1.

Regression model		ICC[a]	*p*	95% CI
Multilevel model		.107	.051	[0.05, 0.37]
	Fixed components:	β	*p*	95% CI
	ATG-S	.08	.113	[-0.02, 0.17]
	ATG-T	.26	.001	[0.13, 0.40]
	GI-S	-.08	.152	[-0.20, 0.03]
	GI-T	.20	.002	[0.08, 0.32]
	Own ranking	.13	.003	[0.05, 0.22]
	Opponent ranking	-.09	.014	[-0.16, -0.02]
	Game location	.33	.116	[-0.09, 0.75]
	Random components:	Value	*p*	95% CI
	Intercept	0.13	.051	[0.05, 0.37]
	Slope ATG-S	< .01	n.a.	n.a.
	Slope ATG-T	.05	.084	[0.02, 0.15]
	Slope GI-S	.01	.478	[0.001, 0.19]
	Slope GI-T	.01	.464	[0.001, 0.20]
Multilevel moderation model		.090	.084	[0.03, 0.29]
	Fixed components:	β	*p*	95% CI
	ATG-S	.05	.265	[-0.04, 0.15]
	ATG-T	.28	< .001	[0.14, 0.41]
	GI-S	-.08	.176	[-0.20, 0.04]
	GI-T	.20	.001	[0.09, 0.31]
	Own ranking	.14	.006	[0.05, 0.24]
	Opponent ranking	-.09	.026	[-0.17, -0.01]
	Game location	.40	.097	[-0.08, 0.88]
	Gender	-.09	.712	[-0.60, 0.42]
	Gender x ATG-S	.12	.227	[-0.07, 0.31]
	Gender x ATG-T	-.29	.038	[-0.56, -0.02]
	Gender x GI-S	-.07	.558	[-0.30, 0.16]
	Gender x GI-T	.21	.072	[-0.02, 0.44]
	Random components:	Value	*p*	95% CI
	Intercept	0.15	.048	[0.06, 0.41]
	Slope ATG-S	< .01	n.a.	n.a.
	Slope ATG-T	.05	.100	[0.01, 0.15]
	Slope GI-S	.01	.456	[0.001, 0.18]
	Slope GI-T	.01	.641	[0.0001, 0.55]

Note. All predictors were grand-mean centered. ATG-S = social Individual Attractions to the Group, ATG-T = task-related Individual Attractions to the Group, GI-S = social Group Integration, GI-T = task-related Group Integration; n.a. = not applicable (between-team variance = 0).

[a]Conditional intraclass correlation coefficient (*r*) indicating the amount of variance accounted for by team-membership when only team-level variables are in the model.

Multilevel moderation analysis. I specified the second model to include gender as a contextual variable so I could examine if it moderated the relationships between cohesion and precompetitive primary appraisal. Thus, to the multilevel model I added gender as another team level predictor (i.e., grand-mean centered with a fixed slope) and included four cross-level interactions between gender and dimensions of cohesion (i.e., product terms of grand-mean centered gender x grand-mean centered dimension of cohesion; fixed slopes for all). I then ran the specified multilevel regression and calculated R^2 (with all slopes fixed) as well as the conditional intraclass correlation (with the random intercept and team level predictors, only). Finally, I compared the present multilevel moderation model to the previous multilevel model with regard to their -2 log likelihood and information criteria.

I expected the relationships between perceptions of cohesion and precompetitive primary appraisal to be stronger for women's teams and I found the product term of gender x ATG-T was significant (see Table 8). However, neither the product terms nor gender as a team level predictor improved the model's ability to predict primary appraisal as the multilevel moderation model explained 32.66% of variance in primary appraisal. That is only 0.37% more than the multilevel model. In addition, the multilevel moderation model performed slightly worse than the multilevel model in terms of its fit to the data with -2 log likelihood = 876.70 and information criteria of AIC = 888.70 and BIC = 911.18 exceeding those of the previous model (Deviance Difference, $X^2_5 = 3.83$, $p > .250$; cf. Bickel, 2007). Finally, gender did not substantially add to the explanation of differences in primary appraisal between teams. Both the conditional intraclass correlation (Δ = -.017) and the amount of unexplained variance in the random component of the intercept (Δ = .02) hardly changed when compared to the previous multilevel model.

Therefore, in summary, I found (a) the multilevel model was the best fitting model and accounted for 32.29% of variance in athletes' precompetitive primary appraisal (i.e., personal importance of the pending competition); (b) perceptions of higher task cohesion (i.e., ATG-T and GI-T) predicted a primary appraisal of higher personal importance on the individual level; (c) better previous performance and a weaker opponent predicted a primary appraisal of higher personal importance on the team level; and (d) these relationships were the same for all teams, including those of a different gender.

Relationships to Precompetitive Secondary Appraisal

Ordinary least squares regression. For precompetitive secondary appraisal as the criterion variable, I specified and ran the first model with a fixed intercept and the four dimensions of

cohesion as (individual level) predictors with fixed slopes (as the non-significant intraclass correlation indicated no team-related dependencies).

I expected perceptions of cohesion to positively predict athletes' precompetitive secondary appraisal (i.e., more positive prospects for coping with competitive demands) and I found they explained 16.00% of variance, $p < .001$. As shown in Table 9, Individual Attractions to the Group (i.e., ATG-S and ATG-T) were the main predictors.

Table 9. Results of OLS Regression and OLS Moderation Analyses with Precompetitive Secondary Appraisal as the Criterion Variable in Study 1.

Regression model	r^2	*p*	95% CI
OLS model	.16	< .001	[0.09, 0.23]
Predictors:	β	*p*	95% CI
ATG-S	.16	.004	[0.07, 0.40]
ATG-T	.41	< .001	[0.38, 0.68]
GI-S	-.11	.081	[-0.31, 0.02]
GI-T	-.12	.070	[-0.32, 0.01]
OLS moderation model[a]	.001-.007[b]	.510-.081	[-0.005, 0.007] -[-0.009, 0.02]
Predictors:	β	*p*	95% CI
Gender x ATG-S	.03	.510	[-0.07, 0.14]
Gender x ATG-T	-.08	.081	[-0.18, 0.01]
Gender x GI-S	.05	.378	[-0.06, 0.15]
Gender x GI-T	.08	.106	[-0.02, 0.19]

Note. OLS = ordinary least squares. ATG-S = social Individual Attractions to the Group, ATG-T = task-related Individual Attractions to the Group, GI-S = social Group Integration, GI-T = task-related Group Integration.

[a]In line with procedures described by Baron and Kenny (1986), I calculated separate stepwise regression analyses for each dimension of team cohesion. Displayed here are results of the final step including gender, the respective cohesion-dimension, and the respective product term (all standardized). [b]Δr^2 as compared to the second step of the respective regression.

Ordinary least squares moderation analysis. In my second model, I aimed to test if gender (as an individual athletes' characteristic) moderated the relationships between perceptions of cohesion and precompetitive secondary appraisal. In line with procedures described by Baron and Kenny (1986), I initially standardized all variables (i.e., secondary appraisal, dimensions of cohesion, gender) and computed the four product terms of gender (standardized) x dimension of cohesion (standardized). I then ran four stepwise OLS regressions with precompetitive secondary appraisal as the criterion variable. In step 1 I included gender (i.e., the moderator), in

step 2 the respective dimension of cohesion (i.e., the predictor), and in step 3 the respective product term.

I expected the relationships between perceptions of cohesion and precompetitive secondary appraisal to be stronger for female athletes. However, I found gender did not moderate any of these relationships, as all product terms were non-significant (see Table 9).

Therefore, in summary, I found (a) the four dimensions of cohesion accounted for 16.00% of variance in athletes' precompetitive secondary appraisal (i.e., perceived prospects for coping with competitive demands); (b) higher Individual Attractions to the Group (i.e., ATG-S and ATG-T) predicted a secondary appraisal of more positive prospects for coping; (c) these relationships were the same for all athletes, including those of a different gender; and (d), in contrast to primary appraisal, secondary appraisal was not specific to a particular team.

11.3 Implications

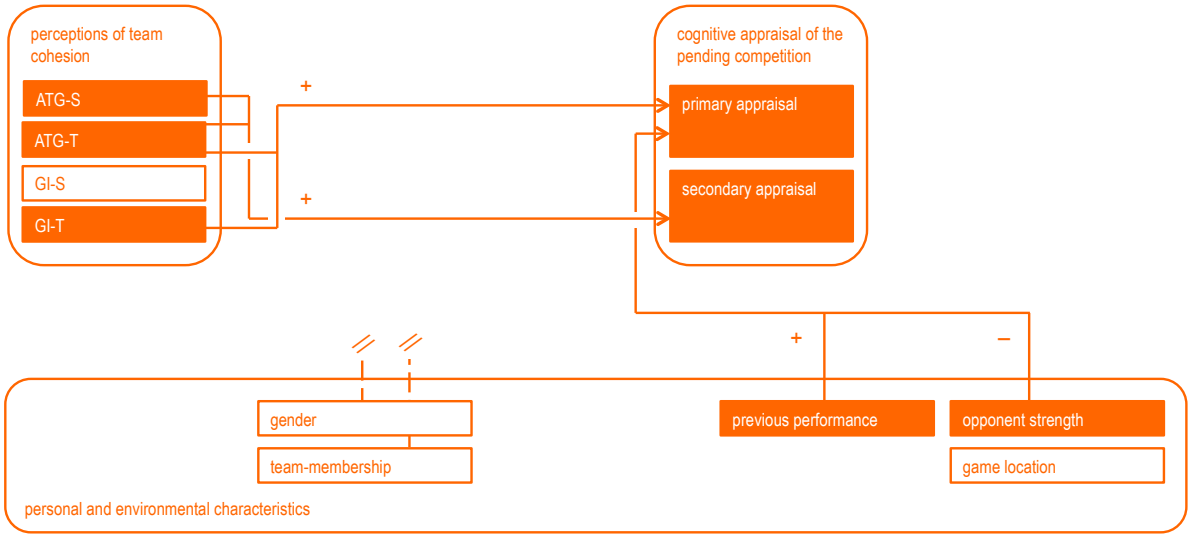

Figure 13. Schematic Representation of Results Pertaining to Study 1, Aim 3.
ATG-S = social Individual Attractions to the Group, ATG-T = task-related Individual Attractions to the Group, GI-S = social Group Integration, and GI-T = task-related Group Integration. Solid boxes mark significant variables and dimensions; solid lines indicate prediction, dashed lines moderation.

As the third and final aim of Study 1, I tested to what extent athletes' perceptions of cohesion predicted their appraisal of a pending team competition (for a schematic representation of the results, see Figure 13). My first hypothesis that the perceived level of team cohesion would predict athletes' precompetitive primary appraisal was supported. Specifically, I found that perceptions of higher task cohesion predicted a primary appraisal of the increased personal

importance of a pending competition. In addition, results showed that teams differed with regard to their precompetitive primary appraisal and these differences were due to their own and their opponent's ranking insofar as a better previous performance and a weaker opponent predicted a primary appraisal of increased personal importance. My second hypothesis that a higher perceived level of cohesion would predict a precompetitive secondary appraisal of more positive prospects for coping with competitive demands was supported as well. Specifically, I found that higher Individual Attractions to the Group accounted for this relationship and teams did not differ with regard to secondary appraisal. My third hypothesis that relationships between cohesion and precompetitive appraisal would be stronger for female athletes, however, was not supported. Instead I found that relationships both to primary and secondary appraisal were the same for all teams.

These findings are in line with theoretical suggestions and previous research on cohesion and cognitive appraisal. The findings support suggestions by general (Lazarus & Folkman, 1984) and sport-specific models of emotion (Fletcher & Fletcher, 2005) that posit social factors to influence a person's cognitive appraisal of a situation and advances from military psychology that found higher levels of cohesion to predict more positive coping prospects (Gilbar et al., 2010; Griffith, 2002). Current findings also support research from exercise psychology that observed higher cohesion to predict both increased task importance and greater expectancies for task success (Gu et al., 2011). The differences in cohesion-dimensions between previous and current research (i.e., ATG-S instead of ATG-T predicting importance/primary appraisal and GI-S instead of ATG predicting outcome expectancies/secondary appraisal) are probably the result of different contexts (i.e., exercise vs. competitive sport) and task-structures (i.e., individual vs. collective).

Findings also speak to the multilevel nature of precompetitive appraisal. Whereas the effect of cohesion was the same for all athletes and teams (e.g., female and male), teams differed with regard to their average precompetitive primary appraisal due to common environmental factors. Specifically, teammates might be affected by increased pressure if they are favored to win (i.e., ranked higher than their opponent). Because both the athletes themselves and significant others such as coaches and spectators would expect a victory, potential failure would be more destructive (Gibson, Sachau, Doll, & Shumate, 2002). Thus, athletes would perceive that there is more at stake in the pending competition (i.e., exhibit a precompetitive primary appraisal of higher personal importance; Haberl, 2007) and this would affect all members of the favored team (Allen et al., 2012). In contrast, I found no team-related differences for precompetitive secondary appraisal. This indicates that athletes' perceived prospects for coping with competitive demands might be more individual in nature, potentially due to unique roles, statuses, and personal resource perceptions (cf.

Cohen & Wills, 1985). A notion that is in line with secondary appraisal being predicted mainly by the individual dimensions of cohesion.

As intended, the results of the present analyses offer an explanation for the links between cohesion and the precompetitive emotional response because, according to cognitive-motivational-relational theory, athletes' appraisal of a pending competition causally determines their emotional response to that competition (Lazarus, 2000; Uphill & Jones, 2007). However, present findings both contradict and support previous research on these links (see Table 2). Because cohesion's relationship to a primary appraisal of increased personal importance would entail increased emotional intensity (Uphill & Jones, 2007), the current findings contradict previous research that predominantly linked higher cohesion to a lower intensity of precompetitive anxiety symptoms. Potentially, the previously found lower intensities were not the function of primary appraisal but a secondary appraisal of more positive prospects for coping, which seems to be linked to both higher cohesion and lower emotional intensity (Hanton, Mellalieu, & Young, 2002; see Chapter 9). Conversely, ATG-T and GI-T predicting primary appraisal supports the previously found dominant effects of task cohesion on the intensity of anxiety symptoms. Because cohesion's relationship to a secondary appraisal of more positive prospects for coping would entail more facilitative interpretations of emotion symptoms (Williams et al., 2010), present findings support previous research that linked higher cohesion to more facilitative interpretations of precompetitive anxiety symptoms. Yet, with ATG predicting secondary appraisal, findings contradict the previously found dominant effect of GI-T in this regard.

Due to its relationship to both increased personal importance and more positive prospects for coping, higher cohesion might be a benefit and a cost at the same time. On the one hand, higher team cohesion might lead to a precompetitive secondary appraisal of more positive prospects for coping with competitive demands, for example, by increasing social support that enhances athletes' self-efficacy and sense of control (Freeman & Rees, 2009; Griffith, 2002). A secondary appraisal of more positive prospects for coping, in turn, leads to a more pleasant emotional tone and more facilitative interpretations of emotion symptoms (Nicholls, Polman, & Levy, 2012; Williams et al., 2010), which generally enhance performance (Lane et al., 2010; Neil et al., 2012). In this context, a high level of cohesion would be a benefit to the respective team-members. On the other hand, higher team cohesion might lead to a precompetitive primary appraisal of higher personal importance, which leads to a more intense precompetitive emotional response (Uphill & Jones, 2007). In the case of technically and tactically demanding tasks or divergent individual preferences, a more intense precompetitive emotional response might reduce performance (Cerin et al., 2000;

Hanin, 2000). In this context, a high level of cohesion would be a cost to the respective team-members.

Although not entirely new (cf. Hardy et al., 2005; Carron, Prapavessis, & Grove, 1994), the idea that a high level of team cohesion could impair performance is contrary to athletes' and coaches' intuitive conception that generally, cohesion is an asset (Paskevich, Estabrooks, Brawley, & Carron, 2001). Therefore, the relationship between higher cohesion and a precompetitive primary appraisal of increased personal importance is especially intriguing. Although their positive links are plausible (see Chapter 9.1), the exact mechanisms underpinning this relationship are unknown. Yet, if this relationship caused performance costs, such knowledge would be essential in developing strategies to counter or curb these costs. To start filling this gap, I concentrated my further research on cohesion and precompetitive primary appraisal and explored team-identification and perceived interdependence as potential mediating mechanisms of their relationship.

12. Team Cohesion and Precompetitive Primary Appraisal

12.1 Relationship to Motivational Force

Although a precompetitive primary appraisal of the increased personal importance of a pending competition might afford potential costs in the form of excessive emotional intensity (Uphill & Jones, 2007; Cerin et al., 2000), it may also contribute to performance through enhanced motivational force. Specifically, expectancy x value theory (Vroom, 1964; Wigfield & Eccles, 2000) defines high personal importance of a task as a main prerequisite for a person's strong effort and persistence both on individual (Wigfield & Eccles, 2000) and collective tasks (Karau & Williams, 1993). Thus, in the case of interactive team sport competitions, athletes' perceptions of higher competition importance (cf. primary appraisal) would lead to greater endeavor and perseverance that would benefit immediate performance (Karau & Williams, 1993; Wigfield & Eccles, 2000) as well as long-term success (Mallet & Hanrahan, 2004).

Because they predicted a precompetitive primary appraisal of the higher personal importance of a pending competition (see Chapter 11), perceptions of higher team cohesion can be expected to enhance not only athletes' emotional intensity (see Chapter 9) but also their motivational force in response to a team competition. Previous research supports this notion by documenting higher levels of cohesion relating to indices of greater motivational force on collective tasks both in sport (Gammage, Carron, & Estabrooks, 2001; McKnight, Williams, & Widmeyer, 1991; Ulvick & Spink, 2013) and work contexts (Karau & Williams, 1997; Karau & Hart, 1998). However, similar to curbing potential emotion-related costs, harnessing potential motivation-related benefits of high cohesion requires further knowledge with regard to the mechanisms underpinning the relationship between cohesion and primary appraisal. Two variables that are likely to explain why higher cohesion relates to the higher personal importance of a pending interactive team sport competition are athletes' identification and perceptions of interdependence.

12.2 Identification and Interdependence as Plausible Mediators

As introduced in Chapter 9.1, team cohesion is linked to identification both on a theoretical and on an empirical level and due to their logical overlap with task cohesion in particular, these links could explain its relationship to a precompetitive primary appraisal of increased personal importance. *Identification* is said to occur when athletes recognize they belong to a team and have

attached value and emotional significance to this membership (Tajfel, 1978). Similarly, team cohesion is defined to encompass a sense of groupness (Jowett & Chaundy, 2004), a high esteem for the team and its members (Karau & Hart, 1998), and a high attraction to the team (Yukelson, Weinberg, & Jackson, 1984). Accordingly, a high level of team cohesion has been suggested (e.g., Allen et al., 2012; Hüffmeier & Hertel, 2011) and found to coincide with stronger team identification (e.g., Bruner et al., 2014; De Backer et al., 2011). When athletes identify strongly with their team, their self-concept expands from individual athlete to team-member and with it the frame of reference for self-evaluation shifts from personal to collective (Allen et al., 2012; Brewer & Gardner, 1996). Thus, a team outcome turns into a personal outcome and, as a result, a team competition becomes personally important (cf. primary appraisal; Lazarus, 1999). As mentioned, higher personal importance is associated with increased emotional intensity (Lazarus, 1999) and greater motivational force (Wigfield & Eccles, 2000). Correspondingly, it has been found, that stronger team-identification links to a more intense emotional response to team-outcomes (e.g., Bizman & Yinon, 2002; Wann, Dolan, McGeorge, & Allison, 1994) and higher individual effort on collective tasks (e.g., Van Dick et al., 2009; Worchel, Rothgerber, Day, Hart, & Butemeyer, 1998).

The other likely explanation of the cohesion–primary appraisal relationship, interdependence, manifests itself in two ways. *Task interdependence* exists if athletes need the contribution of other athletes to successfully complete their performance tasks (Van der Vegt et al., 1998). As such, initiated task interdependence describes the extent to which teammates depend on one's own contributions and received task interdependence describes the extent to which oneself depends on teammates' contributions (Kiggundu, 1983). Positive *outcome interdependence* exists if athletes need their teammates to be successful in order to attain a successful performance outcome themselves (Van der Vegt et al., 1998). The definition of cohesion encompasses aspects of interdependence as it includes teamwork (Yukelson et al., 1984), a sense of collectivity (Terry et al., 2000), and unity of purpose (Yukelson et al., 1984). Further, a cohesive team environment emphasizes both athletes' task and outcome interdependence through increased role clarity (Eys & Carron, 2001), team goal setting, and collective performance rewards (Van Dick et al., 2009) which is reflected in the positive relationship between the two constructs (Chen et al., 2009).

When athletes perceive their team to be highly cohesive and dependent on their individual contributions (i.e., initiated task interdependence and outcome interdependence), they perceive their individual performance to be more important to the team's performance and themselves responsible for their teammates' success (Hardy et al., 2005; Williams, Nida, Baca, & Latané, 1989). Also, when they feel their teammates contribute substantially to their own performance (i.e., received task

interdependence), athletes feel a greater responsibility to reciprocate these efforts in order to uphold equity (Hüffmeier & Hertel, 2011). As a result of both of these mechanisms, a team task and one's contribution to it become more personally important (cf. primary appraisal; Lazarus, 1999). Again, higher personal importance would link to stronger motivational force (Wigfield & Eccles, 2000). In support of this, it has been found, that feelings of indispensability relate to greater individual commitment to a collective task (e.g., Hertel, Niemeyer, & Clauss, 2008; Hüffmeier, Krumm, Kanthak, & Hertel, 2012).

12.3 Interdependent Self-construal as a Plausible Moderator

In addition to likely being mediated by stronger team-identification and higher perceived interdependence, it is plausible that the links between cohesion and precompetitive primary appraisal would be moderated by particular athlete-characteristics as, for example, athletes' interdependent self-construal. Persons with higher interdependent self-construal seem to be more sensitive with regard to social cues and context than their counterparts with lower interdependent self-construal (Cross, Hardin, & Gercek-Swing, 2011). Further, persons with higher interdependent self-construal define themselves more strongly in terms of their interpersonal relationships or group memberships and have a greater motivation to accommodate or benefits others (Markus & Kitayama, 1991). Therefore, higher cohesion might trigger identification and perceptions of interdependence more easily in athletes with higher interdependent self-construal. As compared to their counterparts with lower interdependent self-construal, these athletes might also be more attuned to their team's level of cohesion, social identity, and perceived intra-team dependencies when evaluating the personal importance of a pending interactive team competition, that is, in performing their precompetitive primary appraisal.

13. Study 2: Identification and Interdependence as Mediators Between Team Cohesion and Precompetitive Primary Appraisal

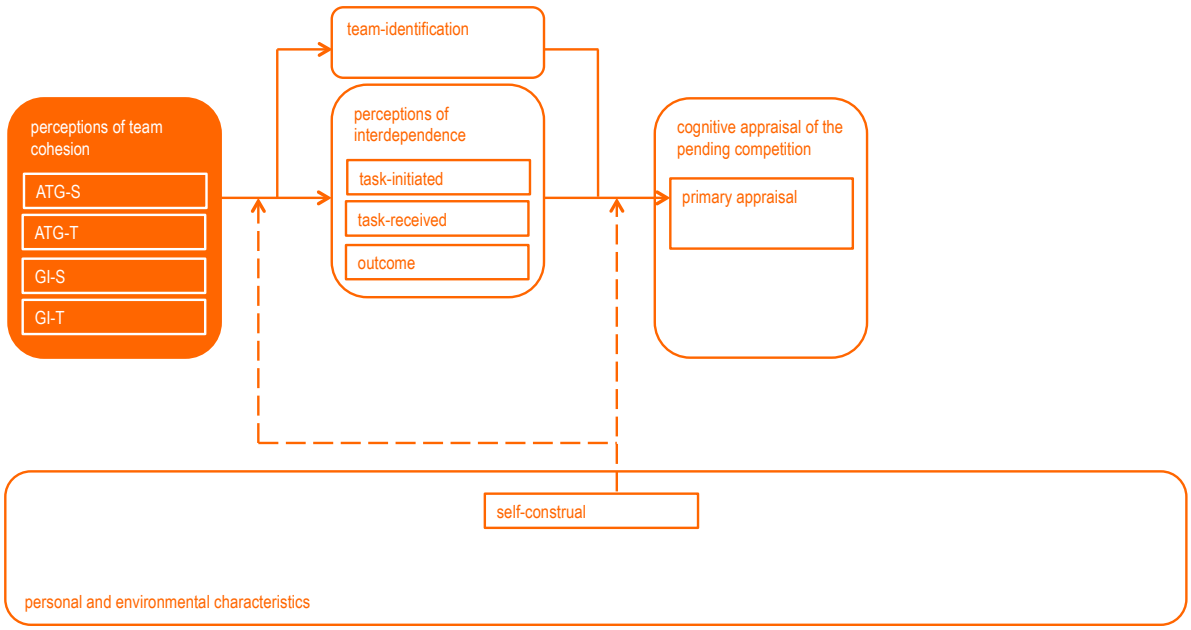

Figure 14. Schematic Representation of Study 2.

ATG-S = social Individual Attractions to the Group, ATG-T = task-related Individual Attractions to the Group, GI-S = social Group Integration, and GI-T = task-related Group Integration. Solid boxes mark the dissertation's central constructs; solid lines indicate prediction, dashed lines moderation.

In Study 1, I found higher task cohesion to predict a precompetitive primary appraisal of increased personal importance. Due to these links, higher cohesion could constitute a potential cost, leading to excessive emotional intensity (Cerin et al., 2000; Uphill & Jones, 2007). At the same time, it could constitute a potential benefit, eliciting greater individual effort on collective tasks (Karau & Williams, 1993). However, curbing potential costs and harnessing potential benefits of higher cohesion both require knowledge of the mechanisms underpinning the cohesion-primary appraisal relationship. I conducted the present study to make a first contribution to this knowledge.

13.1 Research Aim and Hypotheses

As the fourth step in my dissertation and the main aim of Study 2, I tried to further elucidate the relationship between perceptions of higher cohesion and a precompetitive primary appraisal of the increased personal importance of a pending competition. Based on plausible links and previous findings, I hypothesized that team-identification and perceived interdependence would mediate this

relationship. Specifically, I hypothesized that (a) higher ATG-T would predict athletes' stronger identification with their team (because both capture athletes' esteem and attachment regarding their team and team task); (b) higher GI-T would predict athletes' perceptions of greater interdependence (because both capture team-members' perceptions of integration and interconnectedness); (c) both higher ATG-T and GI-T would predict a precompetitive primary appraisal of increased personal importance; (d) stronger identification and perceptions of greater interdependence would also predict a primary appraisal of increased personal importance; and (e) the effect of task cohesion on primary appraisal would be eliminated if regressed together with identification and interdependence. Additionally, I hypothesized that (f) all relationships would be stronger for athletes with higher interdependent self-construal.

13.2 Analyses and Results

The present set of analyses was based on Study 2 as described in Chapter 4.2. As was the case in Study 1, athletes in this study were also nested within their teams. Therefore, I initially tested if this nesting structure had caused any team-related dependencies in the criterion-variables. As displayed in Table 10, I found significant team-effects for the identification-dimensions of Private Evaluation and Interconnection of Self, outcome interdependence, and precompetitive primary appraisal. This means, team-membership alone explained a substantial amount of variance in these variables (as specified by their intraclass correlation coefficient). As a consequence, to predict these variables, I conducted multilevel regression analyses, using restricted maximum likelihood (REML) estimators and permitting intercepts and slopes to vary from team to team. To predict the remaining variables (i.e., Sense of Interdependence and task interdependence), I conducted more conventional ordinary least squares (OLS) regression analyses where intercepts and slopes are assumed to be the same across all teams. Detailed model-specifications for each analysis are displayed as Notes to Tables 11 and 12.

To make coefficients more interpretable and avoid multicollinearity (Bickel, 2007), I grand-mean centered all predictor variables. In addition, I created new team-level variables for all four dimensions of cohesion consisting of their respective team-means (i.e., *ATG-S-Team M* = 5.70, *SD* = 0.32; *ATG-T-Team M* = 5.65, *SD* = 0.38; *GI-S-Team M* = 6.43, *SD* = 1.04; *GI-T-Team M* = 6.30, *SD* = 0.79) and grand-mean centered these variables as well. Finally, I screened predictors for multicollinearity and found it not to be an issue, with no conditioning index exceeding 30. Descriptive statistics for all individual-level variables and inter-correlations are displayed in Table 10.

Table 10. Mean Scores, Interclass Correlation Coefficients, and Bivariate Correlations for Athletes' Perceptions of Team Cohesion, Team-Identification, Perceived Interdependence, Precompetitive Primary Appraisal, and Interdependent Self-Construal in Study 2.

Variable	*M*	*SD*	ICC[a]	*p*	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
Team cohesion:															
1. ATG-S	5.71	0.94	n.o.	n.o.	.20**	.38**	.25**	.43**	.37**	.21**	.08	.16**	.22**	.11*	.01
2. ATG-T	5.65	1.05	n.o.	n.o.	–	.21**	.27**	.32**	.18**	.08	.03	.16**	.12*	.05	.07
3. GI-S	6.44	1.56	n.o.	n.o.		–	.47**	.45**	.34**	.15**	.01	.21**	.26**	.03	.07
4. GI-T	6.31	1.41	n.o.	n.o.			–	.50**	.34**	.24**	-.07	.27**	.31**	.22**	.21**
Identification:															
5. Private Evaluation	7.55	1.19	.19	.004				–	.56**	.26**	.18**	.33**	.43**	.26**	.27**
6. Interconnection of Self	6.04	1.41	.10	.024					–	.60**	.17**	.38**	.34**	.33**	.32**
7. Sense of Interdependence	4.16	2.05	.04	.199						–	.21**	.29**	.23**	.25**	.25*
Interdependence:															
8. Initiated Task	4.36	1.66	.03	.337							–	.25**	.16**	.06	.09
9. Received Task	6.11	1.59	< .01	n.a.								–	.33**	.19**	.24**
10. Outcome	7.02	1.22	.10	.028									–	.35**	.32**
11. Primary Appraisal	7.14	1.51	.18	.005										–	.27**
12. Self-construal	6.23	0.83	n.o.	n.o.											–

Note. N ranging from 376 (ATG-S) to 402 (GI-S). All variables ranged on a scale from 1 to 9. ATG-S = social Individual Attractions to the Group, ATG-T = task-related Individual Attractions to the Group, GI-S = social Group Integration, GI-T = task-related Group Integration; n.o. = not obtained (did not function as criterion-variable in the present analyses); n.a. = not applicable (between-team variance = 0).

[a]Unconditional intraclass correlation coefficient indicating the amount of variance accounted for by team-membership alone.

*p < .05. **p < .01.

Mediation Analyses

My main hypothesis for the present set of analyses was that team-identification and perceived interdependence would mediate the relationship between cohesion and precompetitive primary appraisal. As evidence for successful mediation (a) the independent variable (i.e., cohesion) must affect the mediator (i.e., identification and interdependence), (b) the independent variable must affect the dependent variable (i.e., primary appraisal), and when regressing the dependent variable on both the independent variable and the mediator (c) the mediator must affect the dependent variable and (d) the effect of the independent variable on the dependent variable must be reduced (Baron & Kenny, 1986).

With regard to condition (a), I hypothesized that higher ATG-T would predict athletes' stronger team-identification and higher GI-T would predict their perceptions of greater interdependence. To test these expectations, I used REML- and OLS-estimators as appropriate and regressed the three dimensions of team-identification and the three dimensions of interdependence on the four individual-level dimensions of cohesion and their team-level counterparts. As displayed in Table 11, I found higher individual-level ATG-S and GI-T were the main predictors of stronger team-identification, whereas individual-level GI-T and team-level task cohesion were the dominant predictors of interdependence (both directions). Further, including team-level cohesion as contextual factors eliminated any previous team-related dependencies in identification and interdependence.

Table 11. Results of OLS and Multilevel Mediation Analyses in Study 2.

Criterion		ICC[a]	*p*	95% CI
Private Evaluation		.01	.742	[0.0001, 3.77]
	Predictors:	β	*p*	95% CI
	ATG-S	.39	< .001	[0.27, 0.50]
	ATG-T	.15	.028	[0.02, 0.28]
	GI-T	.24	< .001	[0.15, 0.33]
Interconnection of Self[b]		.05	.148	[0.02, 0.36]
	Predictors:	β	*p*	95% CI
	ATG-S	.41	< .001	[0.25, 0.56]
	GI-S	.14	.031	[0.01, 0.26]
	GI-T	.15	.017	[0.03, 0.27]
Sense of Interdependence[c]		.02	.492	[0.004, 1.33]
	Predictors:	β	*p*	95% CI
	ATG-S	.19	.001	[0.16, 0.64]
	ATG-T	-.13	.017	[-0.48, -0.05]
	GI-T	.14	.037	[0.01, 0.39]

Table 11 continued.

Criterion		ICC[a]	*p*	95% CI
Initiated Task Interdependence[c]		.04	.283	[0.02, 0.67]
	Predictors:	β	*p*	95% CI
	GI-T	-.18	.011	[-0.37, -0.05]
Received Task Interdependence[c]		< .01	n.a.	n.a.
	Predictors:	β	*p*	95% CI
	GI-S	.16	.043	[0.01, 0.32]
	GI-T	.18	.008	[0.06, 0.36]
Outcome Interdependence[d]		.04	.233	[0.01, 0.29]
	Predictors:	β	*p*	95% CI
	ATG-S	.15	.038	[0.01, 0.28]
	GI-T	.28	< .001	[0.14, 0.42]
	ATG-T-Team	1.05	< .001	[0.62, 1.49]
	GI-T-Team	-.55	< .001	[-0.81, -0.29]
Primary Appraisal		.14	.019	[0.14, 0.73]
	Predictors:	β	*p*	95% CI
	GI-T	.23	.009	[0.06, 0.40]
Primary Appraisal – Identification-Model[b,e]		.18[f]	.005	[0.21, 0.86]
	Predictors:	β	*p*	95% CI
	GI-T	.10	.095	[-0.02, 0.22]
	Interconnection of Self	.20	.007	[0.06, 0.34]
Primary Appraisal – Interdependence-Model[b,g]		.18[f]	.005	[0.21, 0.86]
	Predictors:	β	*p*	95% CI
	GI-T	.10	.071	[-0.01, 0.21]
	Outcome Interdependence	.34	< .001	[0.21, 0.46]

Note. When using restricted maximum likelihood (REML) estimators, I always began with an unstructured approach (i.e., allowing the intercept and all individual-level slopes to vary from team to team and these variances to be correlated) and then fixed all components that failed to reached significance. With the exception of the two mediation models, only results for significant predictors are presented. However, each of those models included ATG-S, ATG-T, GI-S, GI-T, ATG-S-Team, ATG-T-Team, GI-S-Team, and GI-T-Team as predictors. ATG-S = social Individual Attractions to the Group, ATG-T = task-related Individual Attractions to the Group, GI-S = social Group Integration, GI-T = task-related Group Integration; ATG-S-Team = team mean for social Individual Attractions to the Group, ATG-T-Team = team mean for task-related Individual Attractions to the Group, GI-S-Team = team mean for social Group Integration, GI-T-Team = team mean for task-related Group Integration; n.a. = not applicable (between-team variance = 0).

[a]Conditional intraclass correlation coefficient indicating the amount of variance accounted for by team-membership when only team-level variables are in the model. [b]REML estimators, random intercept. [c]Ordinary least squares estimators, fixed intercept and slopes. [d]REML estimators, random intercept, random slope individual-level GI-T, co-variances restricted. [e]Variables excluded: Private Evaluation, Sense of Interdependence. [f]Same as unconditional intraclass correlation coefficient (see Table 10) because no team-level variables were in the model. [g]Variables excluded: Received Task Interdependence.

With regard to condition (b), I hypothesized that higher task cohesion would predict a precompetitive primary appraisal of increased personal importance. To test these expectations, I used REML-estimators and regressed primary appraisal on the four individual-level dimensions of cohesion and their team-level counterparts. As shown in Table 11, I found individual-level GI-T was the only significant predictor.

This means, individual-level GI-T was the only cohesion-dimension that predicted all dimensions of team-identification, received task interdependence, outcome interdependence, and precompetitive primary appraisal. Therefore, to confirm conditions (c) and (d), I now regressed precompetitive primary appraisal in one model on individual-level GI-T and all dimensions of identification and in the other model on individual-level GI-T, received task interdependence, and outcome interdependence. I hypothesized that both stronger identification and perceptions of greater interdependence would predict a primary appraisal of increased personal importance and that in both models the effect of task cohesion on primary appraisal would be eliminated. Results (see Table 11) showed that these expectations were met for the identification-dimension Interconnection of Self and outcome interdependence, which mediated the relationship of team cohesion to precompetitive primary appraisal.

Moderation Analyses

Additionally, I hypothesized that all previous relationships would be stronger for athletes with higher interdependent self-construal. To test this expectation, I followed procedures suggested by Barron and Kenny (1986) and first computed product terms of grand-mean centered self-construal and grand-mean centered, individual-level dimensions of cohesion, dimensions of identification, and dimensions of interdependence. Assuming linear moderation, I then repeated the previous analyses but included self-construal and the respective product terms as additional individual-level predictors.

Table 12. Results of OLS and Multilevel Moderation Analyses in Study 2.

Criterion		ICC[a]	*p*	95% CI
Private Evaluation		.01	.742	[0.0001, 3.77]
	Predictors:	β	*p*	95% CI
	Self-construal	.22	.001	[0.09, 0.35]
	Self-construal x GI-T[b]	-.11	.040	[-0.21, -0.01]
Interconnection of Self		.05	.148	[0.02, 0.36]
	Predictors:	β	*p*	95% CI
	Self-construal	.40	< .001	[0.23, 0.59]

Table 12 continued.

Criterion		ICC[a]	*p*	95% CI
Sense of Interdependence		.02	.492	[0.004, 1.33]
	Predictors:	β	*p*	95% CI
	Self-construal	.13	.023	[0.05, 0.61]
Initiated Task Interdependence		.04	.283	[0.02, 0.67]
	Predictors:	β	*p*	95% CI
	Self-construal	.03	.671	[-0.19, 0.29]
Received Task Interdependence		< .01	n.a.	n.a.
	Predictors:	β	*p*	95% CI
	Self-construal	.17	.004	[0.10, 0.55]
	Self-construal x ATG-S[c]	.16	.017	[0.06, 0.61]
Outcome Interdependence		.04	.233	[0.01, 0.29]
	Predictors:	β	*p*	95% CI
	Self-construal	.30	< .001	[0.14, 0.46]
Primary Appraisal		.14	.019	[0.14, 0.73]
	Predictors:	β	*p*	95% CI
	Self-construal	.33	.002	[0.12, 0.54]
Primary Appraisal – Identification-Model		.18	.005	[0.21, 0.86]
	Predictors:	β	*p*	95% CI
	Self-construal	.19	.061	[-0.01, 0.39]
Primary Appraisal – Interdependence-Model		.18	.005	[0.21, 0.86]
	Predictors:	β	*p*	95% CI
	Self-Construal	.25	.015	[0.05, 0.45]

Note. Each model was specified as before (see Table 11) but interdependent self-construal and the appropriate product terms were included as additional individual-level predictors. Specifically, for primary appraisal, dimensions of identification, and interdependence as criteria, the four product terms including individual dimensions of cohesion terms were added. For the Identification Model, the product terms including GI-T and the three dimensions of identification were added. Whereas for the Interdependence Model, the product terms including GI-T, Received Task Interdependence, and Outcome Interdependence were added. Here, only values for interdependent self-construal and significant product terms are presented. ATG-S = social Individual Attractions to the Group, GI-T = task-related Group Integration.

[a]Conditional intraclass correlation coefficients were the same as in Table 11 because no team-level variables were added to the models. [b]Moderate interdependent self-construal (- 1 *SD* < x ≤ + 1 *SD*; *M* = 6.22, *SD* = 0.43; *n* = 211): GI-T β = .39, *p* < .001, 95% CI = [0.26, 0.51]; low interdependent self-construal (x ≤ - 1 *SD*; *M* = 4.94, *SD* = 0.35; *n* = 53): GI-T β = .21, *p* = .145, 95% CI = [-0.08, 0.50]; high interdependent self-construal (x > + 1 *SD*; *M* = 7.42, *SD* = 0.35; *n* = 58): GI-T β = -.04, *p* = .666, 95% CI = [-0.23, 0.15]. [c]High interdependent self-construal: ATG-S β = .41, *p* = .039, 95% CI = [0.04, 1.38]; low interdependent self-construal: ATG-S β = -.27, *p* = .114, 95% CI = [-1.05, 0.12]; moderate interdependent self-construal: ATG-S β = .08, *p* = .304, 95% CI = [-0.13, 0.40].

As displayed in Table 12, self-construal positively predicted all variables except initiated task interdependence. Also, as indicated by significant product terms (Baron & Kenny, 1986), self-construal moderated the relationships between GI-T and the identification dimension of Private Evaluation and between ATG-S and received task interdependence. However, self-construal did not influence any of the mediation-effects identified above.

13.3 Implications

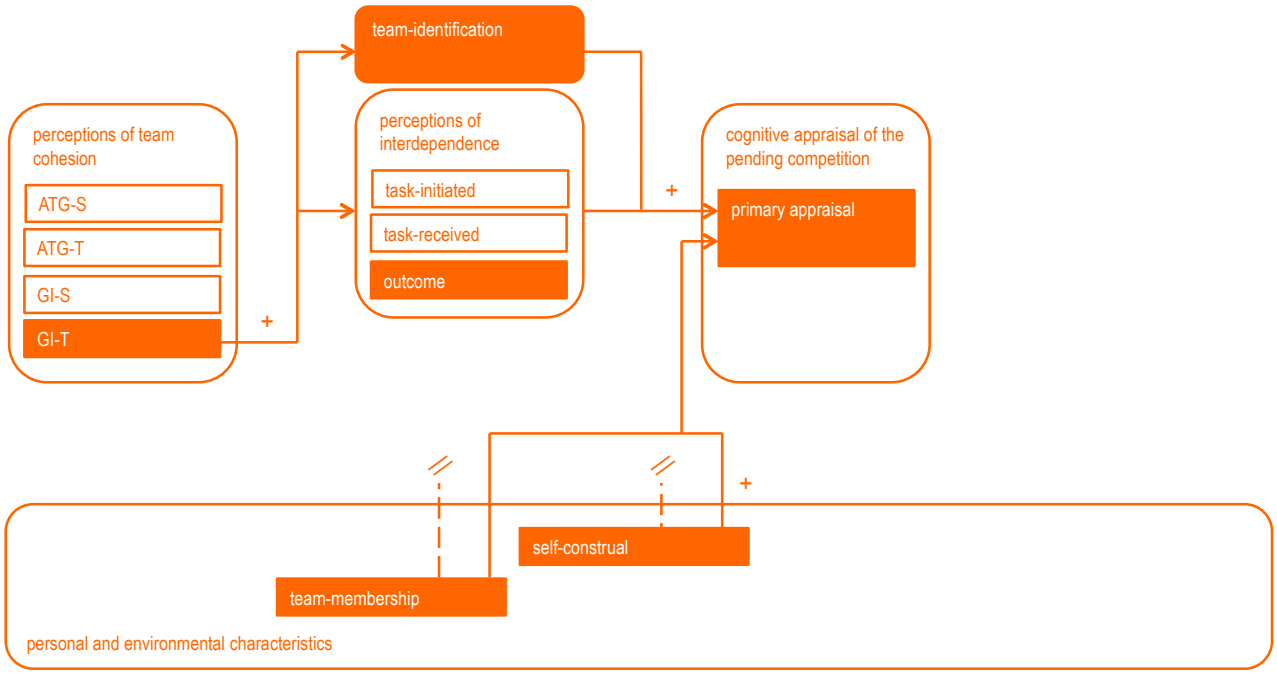

Figure 15. Schematic Representation of Results Pertaining to Study 2.
ATG-S = social Individual Attractions to the Group, ATG-T = task-related Individual Attractions to the Group, GI-S = social Group Integration, and GI-T = task-related Group Integration. Solid boxes mark significant variables and dimensions; solid lines indicate prediction, dashed lines moderation.

As the main aim of Study 2, I tested if team-identification and perceived interdependence mediated the positive relationship between team cohesion and precompetitive primary appraisal (i.e., the personal importance of a pending competition). Generally, results supported this expectation with stronger team-identification in the form of Interconnection of Self and perceptions of greater outcome interdependence mediating the relationship between higher GI-T and a primary appraisal of increased personal importance (for a schematic representation of the results, see Figure 15).

With this, results support previous plausible explanations for the relationship between higher cohesion and a primary appraisal of increased personal importance. First, results support the notion

that higher team cohesion, here in the form of GI-T (i.e., the bonding and similarity around goals and goal-related processes; Carron et al., 1998) would foster the expansion of athletes' self-concept and with it their frame of reference for self-evaluation from individual to team-related concerns (as captured by higher Interconnection of Self and statements such as "This team's successes are my successes." Brewer & Gardner, 1996), which would lead athletes to appraise a pending team competition as more personally important (cf. precompetitive primary appraisal). Second, results support the idea that higher cohesion, again in the form of GI-T (i.e., a sense of collectivity regarding performance goals and processes; Carron et al., 1998) would promote athletes' perceptions of their contributions being indispensible to teammates' success (as captured by higher outcome interdependence), which would lead them to appraise a upcoming game and their performance in this game as more personally important (cf. precompetitive primary appraisal).

Results of the present analyses also speak to the generalizability of relationships and the manifestation of constructs on multiple levels. The relationships among cohesion, identification, interdependence, and precompetitive primary appraisal did not vary depending on athletes' team-membership (i.e., there was no significant inter-team variance in any of the slopes) or their level of interdependent self-construal. However, higher interdependent self-construal directly predicted stronger team-identification, perceptions of greater received task and outcome interdependence, and a primary appraisal of increased personal importance. Further, members of the same team were similar in their identification, perceived outcome interdependence, and primary appraisal. In the case of identification and outcome interdependence, teams' varying levels of cohesion explained these similarities and supported the idea of cohesion shaping the entire team's climate in this respect. The team-dependencies in primary appraisal replicate findings from Study 1 (see Chapter 11) and thus seem to be robust with regard to samples and sport systems.

In contrast, samples and sport systems seem to differ with regard to the links between athletes' perceptions of cohesion and their precompetitive primary appraisal. With regard to direction, the present findings replicate results pertaining to Aim 3 of Study 1 in that perceptions of higher cohesion predicted a primary appraisal of higher personal importance. Conversely, with regard to cohesion-dimensions, current findings deviate from previous results in so far as only GI-T and not ATG-T accounted for this relationship. This means for example, contrary to the Canadian intercollegiate athletes from Study 1, athletes in the German club sport system did not consider a team competition as less important if they were not as happy with their team's task-environment. A possible explanation might be that intercollegiate athletes are bound to their school's team and their only means of reconciling their low team-attraction with their team's assumed high task-attraction

would be to withdraw their task-commitment (Festinger, 1962). Conversely, similar to exercise class participants (Gu et al., 2011), club athletes' team-membership is more flexible and they would be able to resolve such dissonance by active withdrawal and moving to another team. Thus, for them ATG-T would be unrelated to task importance, as it was for exercise class participants. Alternatively, club athletes' ATG-T generally might be too low to have any effects ($M_{Study\ 2}$ = 5.65, SD_{Study2} = 1.05; $M_{Study\ 1}$ = 6.04, $SD_{Study\ 1}$ = 1.06; $F_{1,\ 815}$ = 27.89, p < .001) or other sample-characteristics such as competitive experience ($M_{Study\ 2}$ = 15.10, SD_{Study2} = 5.26; $M_{Study\ 1}$ = 9.91, $SD_{Study\ 1}$ = 4.21; $F_{1,\ 567}$ = 160.71, p < .001) might moderate its link to primary appraisal.

Because of its moderate to strong relationships to identification and interdependence (see Table 10; Cohen 1988), the present analyses offer insight into the definition and conceptualization of team cohesion. Cohesion has been called "a complex construct" (Karau & Hart, 1998, p. 189) and an "often talked about yet difficult to define intangible" (Carron, Shapcott, & Burke, 2007, p. 118). Although current research generally adheres to Carron et al.'s (1998) definition (see Chapter 5.2.1) and considers cohesion distinct from competing constructs such as subjective norm or social support (Courneya & McAuley, 1995), it remains a hypernym and the current findings support the notion that parts of its meaning may be captured by the constructs of identification and interdependence (cf. Allen et al., 2012; Yukelson et al., 1984). Such knowledge and efforts towards a more precise definition of cohesion are relevant because not all dimensions of cohesion relate, for example, to a precompetitive primary appraisal of increased personal importance. In order to manipulate potential cohesion-related effects, coaches and sport psychology consultants need to know which aspects they have to target or if they should turn to a different construct entirely (Karau & Hart, 1998).

Interestingly, a dimension that did not show any correlations with cohesion in the present analyses was initiated task interdependence (see Table 10). However, when including all individual- and team-level dimensions of cohesion in the model, higher GI-T significantly predicted initiated task interdependence, but in an inverse direction (see Table 11). A similar suppression effect occurred for GI-T-Team, which was positively correlated with outcome interdependence but predicted it negatively once all other cohesion dimensions were included in the model (see Table 11). A potential explanation might be that athletes with perceptions of holistically high cohesion expect their teammates to be so effective in assisting each other that their own contributions become irrelevant.

The findings of the present set of analyses support previous research and illuminate why higher cohesion could not only be a benefit but also a potential cost. Higher cohesion predicted increased identification and perceptions of outcome interdependence, and, through these, a

precompetitive primary appraisal of the increased personal importance of a pending competition. Because the higher personal importance of a task (e.g., competition) enhances motivational force (Wigfield & Eccles, 2000) and thus performance on both individual (Mallet & Hanrahan, 2004) and collective tasks (Karau & Williams, 1993), higher cohesion would be a benefit. This is in line with previous links between higher cohesion and enhanced motivational force on collective tasks (e.g., Gammage et al., 2001; Karau & Hart, 1998) and provides a potential explanation for these links. Conversely, higher cohesion could be a cost because a primary appraisal of increased personal importance heightens emotional intensity (Uphill & Jones, 2007) and pressure (Wallace et al., 2005), which could impair performance if athletes engaged in tasks of high complexity and/or disliked high arousal (Cerin et al., 2000; Hanin, 2000). This notion too is supported by previous findings indicating high cohesion to afford drawbacks such as the pressure not to let down teammates (Hardy et al., 2005), a greater need to use self-handicapping strategies (Hausenblas & Carron, 1996), and increased social anxiety (Martin & Fox, 2001). Again, present findings might provide a first insight into the mechanisms underpinning these effects, which would be necessary to prevent or attenuate them.

14. General Discussion

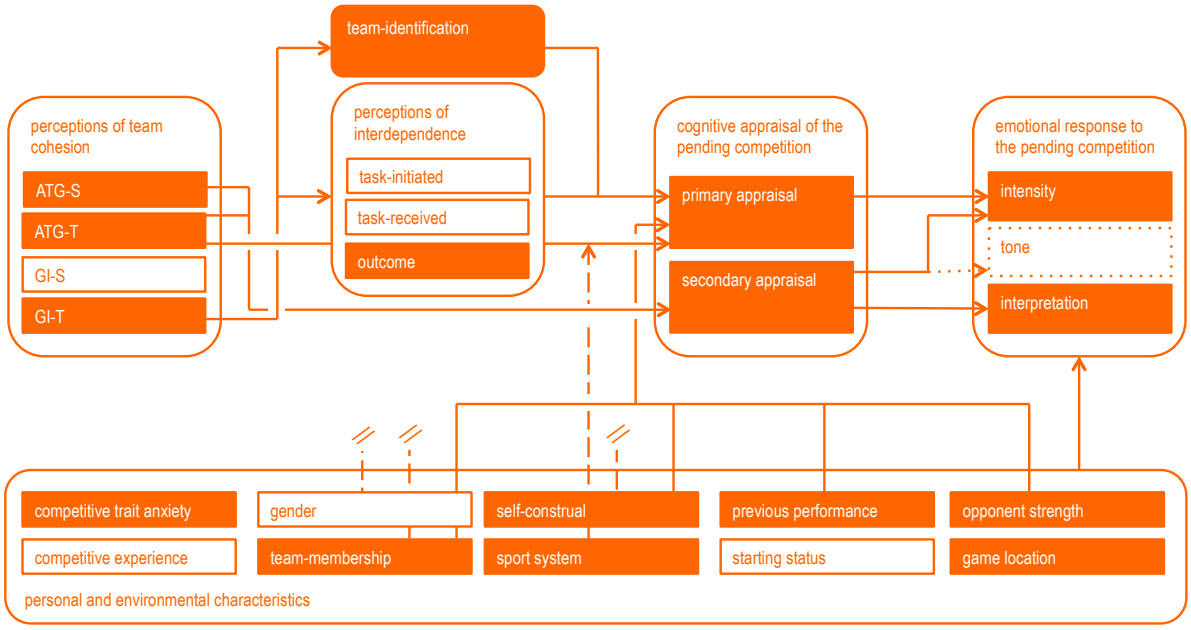

Figure 16. Revised Conceptual Model for Relating Team Cohesion to the Precompetitive Emotional Response.

ATG-S = social Individual Attractions to the Group, ATG-T = task-related Individual Attractions to the Group, GI-S = social Group Integration, and GI-T = task-related Group Integration. Solid boxes mark significant variables and dimensions; solid lines indicate prediction, dashed lines moderation. When measuring the precompetitive anxiety response in Study 1, I assessed only intensity and interpretation, not emotional tone.

The overarching aim of my dissertation was to explain and predict how a team's level of cohesion relates to its members' precompetitive emotional response. Summarizing the research I conducted, I am able to conclude that (a) perceptions of cohesion directly predict athletes' precompetitive appraisal and thereby the intensity, interpretation, and likely the affective tone of the precompetitive emotional response; and (b) in the case of precompetitive primary appraisal and hence emotional intensity, perceptions of cohesion operate through team-identification and perceptions of interdependence. These and the other findings are displayed as part of the revised conceptual model in Figure 16.

Although a higher level of team cohesion might afford both benefits and costs, its adaptive effects are likely to dominate. Higher cohesion would be a benefit (a) because athletes' higher individual attractions to their team predict their precompetitive secondary appraisal of more positive prospects for coping with competitive demands and thus, a more pleasant tone (Nicholls, Polman, & Levy, 2012), more facilitative interpretations (Williams et al., 2010; see Chapter 9), and potentially a lower intensity (see Chapter 9) of their precompetitive emotion symptoms. These characteristics would then likely lead to athletes' increased performance (Neil et al., 2012), health (Isen, 2009), and

adherence (McCarthy & Jones, 2007). Higher cohesion would also be a benefit (b) because athletes' perceptions of higher task cohesion predict their stronger team-identification and perceptions of greater outcome interdependence, and, through these, a precompetitive primary appraisal of the increased personal importance of a pending competition. A primary appraisal of increased personal importance, in turn, would lead to athletes' greater effort and persistence (Wigfield & Eccles, 2000), which enhance individual and collective performance (Karau & Williams, 1993; Mallet & Hanrahan, 2004). Conversely, higher cohesion would be a cost because its relationship to a primary appraisal of increased personal importance would also entail athletes' more intense precompetitive emotional response (Uphill & Jones, 2007; see Chapter 9), which could impair their performance on technically and tactically demanding tasks (e.g., fencing and volleyball; Cerin et al., 2000).

The likely adaptive effects of higher cohesion further apply across different individual and team-characteristics such as levels of interdependent self-construal, gender, and type of interdependent sport. However, the specific cohesion-dimensions that predicted a precompetitive primary appraisal of increased personal importance differed across sport systems (i.e., ATG-T and GI-T for Canadian intercollegiate athletes, GI-T only for German upper-level club athletes). Similarly, athletes' average level of primary appraisal differed across teams. In case of the Canadian intercollegiate sample a primary appraisal of increased personal importance was a function of teams' status as the favorite (i.e., higher own and lower opponent's ranking). In contrast, athletes' secondary appraisal did not show such team-dependencies.

If wanting to harness cohesion-related benefits or curb potential cohesion-related costs, my research provides knowledge necessary to develop and implement effective interventions. For one, I illuminate potential operating mechanisms behind the various relationships. For another, I document that cohesion, although not as strong as competitive trait anxiety, seems to make a unique contribution to athletes' precompetitive emotional response. Therefore, interventions that target cohesion can be expected to have a unique and, due to the specific relationships, likely adaptive effect.

Finally, my dissertation contributes the Precompetitive Appraisal Measure (PAM; see Appendix), a necessary and initially validated tool to assess athletes' appraisal of a pending competition. The PAM would allow continuing to pursue the links between cohesion and appraisal (e.g., with regard to secondary appraisal or individual tasks), testing test the effectiveness of appraisal-centered interventions, and further investigating how well empirical data replicates cognitive-motivational-relational theory.

14.1 Theoretical Implications

First and foremost, my dissertation contributes to explaining previously found links from team cohesion to emotions and motivation in a competitive sport context. Specifically, in line with cognitive-motivational-relational theory (Lazarus, 1999, 2000), results of my analyses suggest that previous relationships between team cohesion and athletes' emotional response to a pending competition (see Table 2) are due to perceptions of cohesion influencing athletes' cognitive appraisal of this competition. In line with expectancy-value theory (Vroom, 1964; Wigfield & Eccles, 2000), these mechanisms also explain previous relationships between cohesion and indices of motivational force (e.g., Karau & Williams, 1997; Ulvick & Spink, 2013). Specifically, results suggest that cohesion operates via stronger team-identification and greater perceived interdependence that lead athletes to appraise a collective task as more personally important. Because the increased personal importance of a task also links to increased pressure (Wallace et al., 2005), results further illuminate previous findings on cohesion-related costs (e.g., Hardy et al., 2005; Hausenblas & Carron, 1996). A cohesive team environment might reduce threats to athletes' self-esteem and team-generated pressure to fulfill norms and carry out responsibilities (Prapavessis & Carron, 1996). However under perception of higher cohesion, threats to social identity are increased and social instead of personal identity is salient (cf. Brewer & Gardner, 1996). Further, a cohesive environment might induce new pressures such as a self-generated desire not to disappoint or let down valued teammates (cf. Hill & Shaw, 2013; Williams et al., 1989)

Second, my dissertation has implications for the understanding of team cohesion. Results of my analyses support its conceptualization as a multidimensional construct and even suggest that cohesion incorporates other social constructs such as identification and perceptions of interdependence as part of these dimensions. Its strong overlap with other constructs would explain the fundamental importance of team cohesion (Lewin, 1939; Lott & Lott, 1965). However, its multiple facets also make it more difficult to attribute both beneficial and costly effects of high cohesion and explicitly manipulate these via applied interventions. Therefore, investigations into the specific operating mechanisms of cohesion, such as the present research program, are essential (cf. Karau & Hart, 1998).

Third, my dissertation provides further information about the antecedents of athletes' precompetitive emotional response. Generally, results of my analyses emphasize the influence of athletes' immediate social environment both for their precompetitive anxiety response (Chapter 7; cf. Babkes Stellino et al., 2012) and their precompetitive appraisal (Chapters 10 and 12; cf. Fletcher & Fletcher, 2005). At the same time, results evoke the relevance of personal characteristics. In line

with interactionist perspectives on personality (e.g., Geukes, Mesagno, Hanrahan, & Kellmann, 2013; Shoda, Mischel, & Wright, 1993), athletes' underlying disposition (e.g., competitive trait anxiety, Study 1; interdependent self-construal, Study 2) seems to dominantly influence their response to situational stimuli. Finally, results illuminate that athletes' precompetitive secondary appraisal and in accordance with this, the affective tone and interpretations of precompetitive emotion symptoms mainly seem to be a function of individual characteristics and perceptions (e.g., the individual-focused dimensions of cohesion and a lack of team-dependencies, see Chapter 11; no relative importance of environmental predictors, see Chapter 7). In contrast, athletes' precompetitive primary appraisal and thus, the intensity of their precompetitive emotional response are strongly linked to environmental factors (e.g., the group-focused dimension of task cohesion, see Chapters 10 and 12; a team's favorite status, see Chapter 11; game location, see Chapter 7). These factors also explained teammates' similarities in precompetitive appraisal. Because similar appraisals would cause similar emotional responses (Lazarus, 1999), these findings suggest that common environmental factors could help elucidate phenomena such as *emotional contagion* (Hatfield, Cacioppo, & Rapson, 1994) or *mood linkage* (Totterdell, 2000).

14.2 Applied Implications

Virtually all athletes are nested within a social context (Kleinert et al., 2012) and as the results of my analyses show, the psychosocial quality of their most immediate context (i.e., their team's level of cohesion) potentially influences athletes' precompetitive appraisal and thus, their precompetitive emotional response. Therefore, my dissertation offers suggestions as to how athletes' immediate social context can be addressed in order to optimize their precompetitive emotional response, the amount of effort they devote to a collective task, and ultimately, individual and team performance.

Likely, the influence of a higher level of team cohesion is going to be adaptive and coaches and sport psychology consultants may play an important role in harnessing these benefits. For one, I suggest coaches and sport psychology consultants should aim to increase athletes' perceptions of ATG, that is, their personal involvement with their team both as a social group and as a performance unit (Carron et al., 1998). This way, they might foster precompetitive challenge appraisals (see Chapter 11), a more pleasant tone, and more facilitative interpretations of athletes' precompetitive emotion symptoms (Nicholls, Polman, & Levy, 2012; Williams et al., 2010; see Chapters 6 and 8). To increase athletes' social involvement (i.e., ATG-S), coaches could be more empathetic and encouraging towards individual team-members (De Backer et al., 2011) and sport psychology

consultants could help implement group norms that center around positive communication, tolerance, and individual recognition (e.g., ways to celebrate team-members' birthdays; Carron et al., 2007; Estabrooks, 2007). To increase athletes' task-related involvement (i.e., ATG-T), coaches could foster individual mastery oriented goals and assure opportunities for athlete input (e.g., through individual meetings; Carron et al., 2007; Heuzé, Sarrazin, Masiero, Raimbault, & Thomas, 2006), whereas sport psychology consultants could help clarify role structures and strengthen individual roles (Eys & Carron, 2001). For another, I suggest coaches and sport psychology consultants should try to increase a team's task cohesion, particularly GI-T, that is, the team's unification around its goals and performance processes (Carron et al. 1998), which might stimulate greater effort and persistence (Karau & Williams, 1993; Wigfield & Eccles, 2000; see Chapter 13). Specifically, coaches and consultants should try to increase aspects of team-identification and outcome interdependence (see Chapter 13), for example, via unique team traditions, team goal setting, or respective team norms (Estabrooks, 2007; Van Dick et al., 2009).

However, an increase in athletes' perceptions of task cohesion, identification, and interdependence needs to be viewed with caution because it might lead to excessive emotional arousal (Cerin et al., 2000; Hanin, 2000; Uphill & Jones, 2007; see Chapters 8, 10, and 12). Therefore, I suggest coaches and sport psychology consultants who work in technically and/or tactically demanding sports should be especially careful when increasing task cohesion. Moreover, all coaches and consultants should monitor individual team-members and whether perceptions of higher task cohesion induce pressures and arousal that exceed individually optimal levels. If they found this to be the case, I suggest they assure that high task cohesion is balanced with high ATG-S, which might balance the high intensity of precompetitive emotion symptoms with a pleasant affective tone and more facilitative interpretations (see above).

Generally, the optimal intensity of emotion symptoms is highly individual (Hanin, 2000), thus, coaches and sport psychology consultants should not neglect to focus on individual athletes even within teams. To assure each team-member is in her or his optimal zone, coaches and especially consultants should teach athletes to autonomously assess and regulate their emotional arousal, for example, through relaxation (Maynard, Smith, & Warwick-Evans, 1995). Further, results of my analyses show that certain personality traits may predispose athletes to a particular precompetitive emotional response (see Chapters 6 and 12). Thus, it would be worthwhile for coaches to identify team-members that are especially high on maladaptive traits such as competitive trait anxiety and refer them to sport psychology consultants. Consultants could then help reduce the costly influence of such traits, for example, by improving how athletes generally feel about themselves and their

abilities (i.e., their self-esteem; Aktop & Erman, 2006). Such individual interventions might be time-consuming, but they promise the greatest relative effect and thus would be justified, even within a team setting.

Nonetheless, team- and cohesion-focused interventions provide certain advantages over commonly employed individual-centered emotion regulation strategies. First, in contrast to trait-based strategies, cohesion-focused interventions would promise quicker effects because cohesion is substantially more dynamic (i.e., malleable to intervention-induced change; Carron et al., 1998; Copeland et al., 2009). Second, in contrast to relaxation and similar strategies, cohesion-focused interventions can be implemented prior to the precompetitive situation and would preserve all attentional capacity for the performance task (Tice & Bratslavsky, 2000). Third, in contrast to individualized strategies, cohesion-focused interventions would affect all members of a team at once and regardless of certain personal characteristics (see Chapters 10 and 12). Further, team-based interventions might foster athletes' acceptance of psychological skills training and their compliance with such programs due to decreased individual stigmas and increased peer support. Along these lines, coaches and sport psychology consultants should also target influential environmental characteristics in a team setting. For example, with support from consultants, coaches could simulate conditions of being the favorite and teams could learn how to cope with these characteristics.

Recently, research has started to acknowledge and explore interpersonal and group influences on emotion regulation (e.g., Friesen et al., 2013; Tamminen & Crocker, 2013). My dissertation contributes to this research by suggesting team cohesion provides an intervention-approach that could regulate the precompetitive emotional response, increase motivational force, and conserve cognitive, timely, and monetary resources that athletes, coaches, and teams could allocate to enhancing performance in other ways.

14.3 Limitations and Future Directions

Although it enhances our understanding of the relationships between cohesion and the precompetitive emotional response and our ability to address these links in an adaptive way, my dissertation is certainly not without limitations and prompts new questions to explore in future research.

The biggest weakness of my dissertation is the correlational design of the two studies. Because of this, I am not able to make any claims regarding causality, that is, if higher team

cohesion not only relates to but actually influences precompetitive primary and secondary appraisal. It is highly likely, that cohesion and appraisal link in a circular fashion. For example, an imminent threat might lead to increased affiliation (Kulik, Mahler, & Moore, 1996; Schachter, 1959) that could be reported as increased perceptions of team cohesion. However, it is in line with logical and common procedures (Crocker, Mosevich, Kowalski, & Besenski, 2010), first to establish if constructs are generally related before trying to change one by manipulating the other. Also, it made sense first to examine which dimensions and correlates account for the relationship before designing experiments that focus on testing and manipulating these aspects specifically. Because my dissertation supplies this kind of fundamental information, future research should aim to investigate the assumed causalities either (a) by way of longitudinal, cross-lagged designs or (b) by specifically manipulating for example ATG-T in laboratory experiments or controlled field interventions and testing in which ways this affects athletes' appraisal of a pending team sport competition.

A second limitation of my dissertation is its selectivity. First, I selectively focused on cohesion's relationship to precompetitive primary appraisal (Study 2) and left the mechanisms behind cohesion and precompetitive secondary appraisal intentionally unexplored. Second, within this relationship, I selectively studied team-identification and perceptions of interdependence as mediators and disregarded, for example, role- and norm-related processes. Third, I selected two (i.e., gender, Study 1; interdependent self-construal, Study 2) of various possible moderators of the cohesion-appraisal relationship. Although the consistency of relationships across teams (see Chapters 10 and 12) tentatively eliminated team-level moderators (e.g., ranking, opposition, game location), potential influences of other factors (e.g., athletes' age, interdependence-structures, competitive levels) remain untested. Fourth, I selected a limited number of predictors of the precompetitive anxiety response (see Chapter 7), which leaves the relative importance of other characteristics (e.g., self-confidence, neuroticism) unknown. Fifth, with the Group Environment Questionnaire (Carron et al., 1985) and the Competitive State Anxiety Inventory-2D (Jones & Swain, 1992; Martens et al., 1990), I selected particular self-report measures at the expense of alternative indices (e.g., observational, physiological, implicit) or tools (e.g., the *Sport Emotion Questionnaire, SEQ* assessing both emotional intensity and tone; Jones et al., 2005). As an example of the potential influence of particular measures, a switch from the original (Martens et al., 1990) to the revised version of the Competitive State Anxiety Inventory-2 (Cox et al., 2003) in connection with Aim 1 of Study 1 induced changes in terms of results' significance values (results of the full alternative analyses are provided as part of the Appendix). Although these changes did not alter

overall conclusions, researchers should be aware of such influences and seek to validate the current findings with different tools.

Other possible emphases of future research could be to investigate (a) if perceptions of social support and self-efficacy mediate the relationship between cohesion and precompetitive secondary appraisal, as findings from military psychology (Gilbar et al., 2010; Griffith, 2002) suggest; (b) if team roles and norms play a part in relating cohesion to the precompetitive emotional response; and (c) if cohesion has a different effect and operates through different mechanisms (e.g., self-presentational concerns) in sport teams with different interdependence structures (e.g., independence regarding the outcome). In addition, future research could aim to better define the theoretical concept of team cohesion and continue to explore its overlap or distinctiveness with regard to competing constructs.

Finally, as part of my dissertation, I developed the Precompetitive Appraisal Measure (PAM; see Appendix) and I would welcome future research to continue validating and using it. Although I supported the PAM's initial validity in Chapter 9, the validation of a measure is an ongoing process (Martin et al., 2013) and future research should explore, for example, experimental inductions of threat and challenge (Williams et al., 2010) or different samples. At this point, the PAM has been validated with team sport athletes only. Due to their differences with regard to the precompetitive emotional response (e.g., Mellalieu et al., 2004), athletes from other types of sport can be expected to report different values on the PAM-items and -subscales. Yet, there is no reason to believe that the principles of cognitive-motivational-relational theory (i.e., the content and structure of the questionnaire) would not apply to these athletes equally (Uphill & Jones, 2007). However, further research needs to investigate this.

Generally, I would suggest the PAM can be applied in a variety of settings. Sport psychology researchers can incorporate the PAM to investigate the precompetitive stress and emotion process comprehensively (e.g., considering reflexive relationships such as coping behaviors that change the situational conditions and thus necessitate re-appraisal; Nicholls, Polman, & Levy, 2012) or to reveal antecedents of particularly adaptive appraisal judgments (e.g., high perceptions of control). Applied sport psychology consultants can employ the PAM as a diagnostic tool to identify athletes who would be especially vulnerable to threat appraisals and thus more likely to experience emotion-related detriments. Lastly, researchers outside of sport psychology can use the PAM, for example, further to investigate the relationships among psychological, physiological, biomechanical, and other performance parameters (e.g., Bray et al., 2008).

15. Conclusion

Competing in sport can be highly emotional and a competition may cause athletes to experience pressure and even anxiety. My dissertation now documents that the psychosocial quality of athletes' most immediate social group, that is, their teams' level of cohesion, has the potential to adaptively influence their emotional response to a pending competition. Descriptively, cohesion has an impact above and beyond athletes' personal disposition and other factors. This impact is explained by cohesion relating to athletes' team-identification, perceptions of interdependence and thus, their precompetitive appraisal. Specifically, higher cohesion was able to predict athletes' appraising a competition as a challenge instead of a threat, which would lead to them respond with excitement instead of anxiety and increase their motivational force.

Although it does afford unique pressures such as the desire not to let down valued teammates, a team that sticks together, is united, and satisfies its members' needs, has a predominantly adaptive effect on athletes' precompetitive emotional response. Both research and intervention should acknowledge this effect so they can control for it if not desired (e.g., in case of increased pressures or if trying to identify the influence of other factors) and foster it in other cases. In addition, it would be interesting to see if this effect also applied to other performance contexts. Wouldn't a musician experience less stage fright prior to a concert if she were part of a more cohesive orchestra? Wouldn't a firefighter show fewer nerves prior to an operation if he belonged to a more cohesive squad? Wouldn't a manager be less tense prior to a pitch if she were the member of a more cohesive sales team? These influences remain to be described, explained, and predicted.

In the emotion-inducing context of competitive sport, a more cohesive social environment predicts a more adaptive precompetitive response. Thus, such an environment, particularly athletes' personal involvement with their team, should be nurtured to provide athletes with a strong team to back them up and a better chance for competitive success.

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17. Appendix

17.1 Alternative Results for Study 1, Aim 1

Presented below are results of follow-up analyses on the data from Study 1 that use the revised (Cox et al., 2003) instead of the original Competitive State Anxiety Inventory-2 (CSAI-2; Martens et al., 1990) to investigate which among a selection of predictors contributed the most to both the intensity and interpretation of precompetitive anxiety symptoms and how important team cohesion was in this context. As compared to the original version (see Chapter 4.1.2), the revised CSAI-2 omits two items from the somatic subscale (i.e., "I feel nervous.", "My body feels relaxed.") and four items from the cognitive subscale (i.e., "I am concerned about this competition.", "I have self-doubts.", "I'm concerned about reaching my goal.", "I'm concerned I won't be able to concentrate."). Because they entirely replicate original procedures (see Chapter 7.3), the follow-up analyses demonstrated how a change in measurement tools may influence results, for example, by changing significance values.

Table A1. Mean Scores and Bivariate Correlations for Athletes' Precompetitive Anxiety Response as Pertaining to Study 1, Aim 1 when Employing the Revised Competitive State Anxiety Inventory-2 (Subscales' Internal Consistencies in Parentheses).

Variable	*M*	*SD*	Scale	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
Team cohesion:													
1. ATG-S (α = .72)	7.54	1.27	1 to 9	.23**	.46**	.37**	.01	-.17**	.02	.08	-.07	-.11	-.25**
2. ATG-T (α = .76)	6.17	1.09	1 to 9	–	.20**	.21**	-.03	-.13*	.02	.03	-.09	-.10	-.10
3. GI-S (α = .76)	7.10	1.36	1 to 9		–	.44*	-.09	-.05	-.09	-.01	-.06	-.02	-.16*
4. GI-T (α = .74)	6.31	0.93	1 to 9			–	-.01	-.07	-.05	-.04	.02	-.002	-.18**
Precompetitive anxiety response:													
5. Intensity somatic (α = .80)	1.49	0.47	1 to 4				–	.54**	-.29**	-.26**	.62**	.35**	.24**
6. Intensity cognitive α = .83)	1.97	0.66	1 to 4					–	-.32**	-.49**	.42**	.62**	.26**
7. Interpretation somatic (α = .91)	0.64	1.21	-3 to +3						–	.71**	-.27**	-.29**	-.13*
8. Interpretation cognitive (α = .85)	0.22	1.33	-3 to +3							–	-.24**	-.46**	-.15*
Competitive trait anxiety:													
9. Somatic (α = .76)	1.60	0.45	1 to 4								–	.49**	.29**
10. Worry (α = .90)	2.13	0.65	1 to 4									–	.35**
11. Concentration (α = .74)	1.38	0.37	1 to 4										–

Note: *N* = 252 for all, except intensity somatic (*N* = 251), somatic trait anxiety (*N* = 250), and ATG-S (*N* = 251). ATG-S = social Individual Attractions to the Group, ATG-T = task-related Individual Attractions to the Group, GI-S = social Group Integration, GI-T = task-related Group Integration.

*$p < .05$. **$p < .01$.

Table A2. Results of Logistic Regression Analyses and Significant Individual Predictors of Athletes' Precompetitive Anxiety Response (Extreme-Groups) when Employing the Revised Competitive State Anxiety Inventory-2.

Precompetitive anxiety response	X^2	*df*	*p*	Nagelkerke's r^2	% classified
Intensity somatic (*n* = 124)	59.73	14	< .001	.53	80.60
Significant predictors:	B	*SE*	Wald's X^{2a}	*p*	Odds ratio
Trait anxiety somatic	1.57	0.38	17.11	< .001	4.82
Own ranking	1.01	0.38	7.12	.008	2.74
Game location[b]	-1.82	0.71	6.69	.010	0.16
Intensity cognitive (*n* = 116)	67.00	14	< .001	.59	83.60
Significant predictors:	B	*SE*	Wald's X^2	*p*	Odds ratio
Trait anxiety worry	1.54	0.39	15.26	< .001	4.65
Opponent ranking	-0.92	0.38	5.90	.015	0.40
Team cohesion ATG-S[d]	-0.75	0.38	3.82	.051	0.47
Interpretation somatic (*n* = 133)	25.98	14	.026	.24	67.70
Significant predictors:	B	*SE*	Wald's X^2	*p*	Odds ratio
Team cohesion GI-T[e]	0.60	0.26	5.16	.023	1.81
Trait anxiety worry	0.48	0.25	3.77	.052	1.61
Team cohesion ATG-S	-0.38	0.26	2.08	.149	0.69
Interpretation cognitive (*n* = 133)	42.59	14	< .001	.37	75.90
Significant predictors:	B	*SE*	Wald's X^2	*p*	Odds ratio
Trait anxiety worry	1.05	0.30	12.60	< .001	2.87
Gender[f]	1.23	0.50	6.03	.014	3.43

Note. For precompetitive anxiety symptoms, the response-categories (1) were *higher intensity* and *more debilitative interpretation*; the reference-categories (0) were *lower intensity* and *more facilitative interpretation*, respectively. ATG-S = social Individual Attractions to the Group, GI-T = task-related Group Integration.

[a]*df* = 1 for all. [b]1 = away, 2 = home. [c]Values with the original Competitive State Anxiety Inventory-2 (CSAI-2) were B = -0.66, *SE* = 0.35, Wald's X^2 = 3.66, *p* = .056, Odds ratio = 0.52. [d]Values with the original CSAI-2 were B = -0.43, *SE* = 0.36, Wald's X^2 = 1.46, *p* = .227, Odds ratio = 0.65. [e]Values with the original CSAI-2 were B = 0.50, *SE* = 0.26, Wald's X^2 = 3.61, *p* = .057, Odds ratio = 1.64. [f]1 = male, 2 = female; values with the original CSAI-2 were B = 0.85, *SE* = 0.54, Wald's X^2 = 2.45, *p* = .118, Odds ratio = 2.34.

17.2 The Precompetitive Appraisal Measure

English Version

The following statements ask about the thoughts and feelings you are having about the upcoming competition *right now*. Please circle the appropriate number to the right of each statement to indicate *to what extent you agree with this statement*.

	strongly disagree								strongly disagree
The upcoming competition is important to me.	1	2	3	4	5	6	7	8	9
In the upcoming competition, there is a lot at stake.	1	2	3	4	5	6	7	8	9
The upcoming competition is desirable to me.	1	2	3	4	5	6	7	8	9
I'm in control of the upcoming competition.	1	2	3	4	5	6	7	8	9
I'm responsible for the upcoming competition.	1	2	3	4	5	6	7	8	9
The upcoming competition is likely to result in a positive outcome for me.	1	2	3	4	5	6	7	8	9

Primary Appraisal: mean of items 1, 2, and 3. Secondary Appraisal: mean of items 4, 5, and 6.

German Version

In den folgenden Aussagen geht es darum was Du *jetzt im Moment* bezüglich des bevorstehenden Wettkampfes denkst & empfindest. Bitte gib zu jeder Aussage an, *wie sehr Du persönlich zustimmst* indem Du die entsprechende Ziffer ankreuzt.

	stimme überhaupt nicht zu								stimme voll und ganz zu
Der bevorstehende Wettkampf ist wichtig für mich.	1	2	3	4	5	6	7	8	9
Im bevorstehenden Wettkampf steht eine Menge auf dem Spiel.	1	2	3	4	5	6	7	8	9
Der bevorstehende Wettkampf ist erstrebenswert für mich.	1	2	3	4	5	6	7	8	9
Ich habe den bevorstehenden Wettkampf unter Kontrolle.	1	2	3	4	5	6	7	8	9
Ich bin für den bevorstehenden Wettkampf verantwortlich.	1	2	3	4	5	6	7	8	9
Es ist wahrscheinlich, dass der bevorstehende Wettkampf gut für mich ausgeht.	1	2	3	4	5	6	7	8	9

Primäre Bewertung: Mittelwert der Items 1, 2, und 3. Sekundäre Bewertung: Mittelwert der Items 4, 5, und 6.

17.3 List of Publications and Conference Contributions

Peer Reviewed

Wolf, S. A., Evans, M. B., Laborde, S., & Kleinert, J. (2014). Assessing what generates precompetitive emotions: Development of the Precompetitive Appraisal Measure. *Journal of Sports Sciences*. Advance online publication. Doi 10.1080/02640414.2014.951873

Wolf, S. A., Eys, M. A., & Kleinert, J. (in press). Predictors of the precompetitive anxiety response: Relative impact and prospects for anxiety regulation. *International Journal of Sport & Exercise Psychology*.

Non-Peer Reviewed

Wolf, S. A. (2013, April). Einer für alle und alle für einen – Mannschaftszusammenhalt und Wettkampfangst [One for all and all for one – Team cohesion and precompetitive anxiety]. *Fußballtraining.de*. Retrieved from http://www.fussballtraining.de/ allgemein/einer-fur-alle-&-alle-fur-einen-mannschaftszusammenhalt-&-wettkampfangst/8543

Conference Papers

Wolf, S. A., & Kleinert, J. (2013, July). Aspects of Choking: Antecedents. In K. Geukes, S. A. Wolf, F. Lautenbach, & C. Mesagno (Chairs), *Aspects of Choking: Current debates, pressure concept, antecedents, and possible prevention*. Symposium conducted at the 13th meeting of the International Society of Sport Psychology, Beijing, China.

Wolf, S. A., & Kleinert, J. (2013, July). Interdependence and identification as mediators between team cohesion and precompetitive emotions. In K. Moesch & K. Fransen (Chairs), *Team functioning I: Emotional aspects*. Symposium conducted at the 13th meeting of the International Society of Sport Psychology, Beijing, China.

Wolf, S. A., Bäßler, A., Neuhofer, K., & Kleinert, J. (2013, May). *Kohäsion – was ist das eigentlich? Überschneidungen von Mannschaftskohäsion mit Interdependenz und Identifikation* [Cohesion – what's that anyway? Overlaps of team cohesion with interdependence and identification]. Paper presented at the 45th annual meeting of the German Association of Sport Psychology, Halle (Saale), Germany.

Wolf, S. A., Sadler, P., Eys, M., & Kleinert, J. (2012, June). *Team cohesion predicts athletes' precompetitive appraisals: Is this a link between cohesion and emotion?* Paper presented at the annual meeting of the North American Society for the Psychology of Sport and Physical Activity, Honolulu, HI, USA.

Wolf, S. A., & Kleinert, J. (2012, May). *Wer denkt wie? Personenbezogene Unterschiede zwischen Athleten mit adaptiven und maladaptiven Bewertungsmustern einer Vorstartsituation* [Who thinks which way? Person-specific differences between athletes with adaptive and maladaptive patterns of precompetitive appraisal]. Paper presented at the 44th annual meeting of the German Association of Sport Psychology, Kiel, Germany.

Wolf, S. A., Eys, M., & Kleinert, J. (2011, July). *Cognitive appraisal in Sport: Development and preliminary validation of a precompetitive appraisal measure*. Paper presented at the 32nd International Conference of the Stress and Anxiety Research Society, Münster, Germany.

Wolf, S. A., & Kleinert, J. (2011, July). The relationship of team cohesion and precompetitive emotions in male interactive team sport athletes. In F. Boen (Chair), *Dynamics of group relations in interactive team sports*. Symposium conducted at the 13th meeting of the European Federation of Sport Psychology, Madeira, Portugal.

Wolf, S. A., Kleinert, J., & Eys, M. (2011, June). *Der Zusammenhang von Gruppenkohäsion und emotionalem Vorstartzustand bei männlichen Mannschaftssportlern* [The relationship between team cohesion and the precompetitive emotional state in male team-sport athletes]. Paper presented at the 43rd annual meeting of the German Association of Sport Psychology, Cologne, Germany.

Wolf, S. A., Eys, M., & Kleinert, J. (2011, March). *Precompetitive anxiety and the athletic team: Relative importance of team cohesion*. Paper presented at the 15th annual Eastern Canada Sport and Exercise Psychology Symposium, Waterloo, ON, Canada.

Conference Posters

Wolf, S. A., & Kleinert, J. (2013, October). *It's all the same: It is important. – Self-construal does not moderate the relationship between team cohesion and the perceived importance of a team-competition.* Poster presented at the annual meeting of the Canadian Society for Psychomotor Learning and Sport Psychology, Kelowna, BC, Canada.

Wolf, S. A., & Kleinert, J. (2012, May). *Das Precompetitive Appraisal Measure: Ein Fragebogen zur Erfassung der kognitiven Bewertung einer Vorstartsituation* [The Precompetitive Appraisal Measure: A questionnaire to assess the cognitive appraisal of a precompetitive situation]. Poster presented at the 44th annual meeting of the German Association of Sport Psychology, Kiel, Germany.

Wolf, S. A., Eys, M., & Kleinert, J. (2011, July). *Cognitive appraisal judgments as determinants of the precompetitive emotional response.* Poster presented at the 16th annual congress of the European College of Sport Science, Liverpool, UK.

18. Curriculum Vitae

Svenja Anna Wolf

Born 07.12.1983 in Bergisch Gladbach, Germany

2009 – 2014	Doctorate in Sport Science Department of Health and Social Psychology, Institute of Psychology, German Sport University Cologne
2011 – 2014	Doctoral Fellow Research group "Functional Loading to Build and Preserve Psycho-Biological Performance Potential ", German Sport University Cologne
2011 – 2014	Doctoral Fellowship German Sport University Cologne
2010 – 2011	Visiting Researcher Group Dynamics and Physical Activity Laboratory, Department of Kinesiology and Physical Education, Faculty of Science, Wilfrid Laurier University, Waterloo, ON, Canada
2010	Doctoral Fellowship German Academic Exchange Service, Bonn
2009 – 2010	Scientific Staff Member Department of Health and Social Psychology, Institute of Psychology, German Sport University Cologne
2010	Certification Expert in Sport Psychology German Association of Sport Psychology
2009	Diploma in Sport Science, emphasis Training and Performance German Sport University Cologne; final grade: 1.8
2009	Toyota-Science Award, category Best Theses 2008 German Sport University Cologne and Toyota Germany
2007 – 2009	Research Assistant Department of Health and Social Psychology, Institute of Psychology, German Sport University Cologne
2008	Student Research Grant German Sport University Cologne
Fall 2006	Semester abroad State University of New York College at Cortland, USA
2003	Abitur Gymnasium Maria Königin Lennestadt, Germany; final grade: 1.5