

Spontaneous self-talk: An insight into the cognitive component of emotions in sport

ALEXANDER T. LATINJAK^{*/**}, JORDI CORBALAN-FRIGOLA^{**},
PAU ALCOY-FABREGAS^{**} and JAMIE B.BARKER^{***}

(*) *School of Social Sciences and Humanities, University of Suffolk, UK*

(**) *School of Health and Sport Sciences, EUSES, University of Girona, Spain*

(***) *School of Sport, Exercise and Health Sciences, Loughborough University, UK*

The purpose of this study was to examine the content of spontaneous self-talk, that is non-instrumental statements that come to mind unbidden and effortlessly, in positive and negative emotion-eliciting situations. Thirty male athletes answered, in one-to-one meetings with a trained research assistant, a booklet with questions on spontaneous self-talk in situations eliciting anger, anxiety, excitement and euphoria. Our results yielded light, generally, on the structure of spontaneous self-talk in emotion-eliciting situations, and particularly, on the content of spontaneous self-talk in each type of emotion-eliciting situation. Particularly, most spontaneous self-talk was positive and anticipatory with excitement (68%), positive and retrospective with euphoria (68%), negative or neutral and anticipatory with anxiety (78%), and negative and retrospective with anger (85%). Hence, specific interventions for each emotion, and its corresponding spontaneous self-talk, are proposed.

KEY WORDS: Athletes, Emotion regulation, Sport, Time perspective, Thoughts, Valence.

Commentators, coaches, athletes and sport psychology practitioners and researchers all highlight the important role of emotions in relation to sport performance (e.g., Hanin, 2007; Jones, 2003). Moreover, there is a broad consensus among theories in psychology that emotions are linked to cognition and cognitive processes, such as thoughts and self-talk (Lazarus, 2000; Ortony, Clore, & Collins, 1988). Hence, it is not surprising that emotion and cognition have frequently been studied together (e.g., Dolcos & Denkova, 2015). Indeed, understanding the cognitive component of emotions could help applied sport psychologists to develop cognitive interventions which

Correspondence to: Alexander T. Latinjak, School for Social Sciences and Humanities, University of Suffolk. Waterfront Building, 19 Neptune Quay, IP4 1QJ Ipswich, UK. (E-mail: a.latinjak@uos.ac.uk)

allow athletes to self-regulate their emotions (see Latinjak, Font-Lladó, Zourbanos, & Hatzigeorgiadis, 2016). Likewise, the extant literature demonstrates that emotion regulation is important for individual (e.g., Lane, Beedie, Jones, Uphill, & Devonport, 2012; Martinent, Ledos, Ferrand, Campo, & Nicolas, 2015), and collective (e.g., Géczi, Bognár, Tóth, Sipos, & Fügedi, 2008) performance levels. To illustrate, for an athlete experiencing anger being able to think rationally, understand the intentions of the coach and how he/ she believes that their situation can be solved, would eventually lead to anger regulation, better collaboration between coach and athlete, and finally, better performance. Hence, our study focuses on links between cognitive processes and emotions in sports.

Regarding the research approach, in our study we adopted a metacognitive approach to cognition and emotion. Nonetheless, cognitive processes linked to emotions have been studied on two different levels: metacognitive and neurological (Ray & Zald, 2012). Metacognitive studies indicate that, on one hand, emotions bias diverse processes, such as attention (Most, Chun, Widders, & Zald, 2005) or decision making (Knutson, Wimmer, Kuhnen, & Winkielman, 2008); and, on the other hand, emotions can be modified by cognitive processes, such as reappraisal (Ray, Wilhelm, & Gross, 2008) or self-talk (Hatzigeorgiadis, Zourbanos, & Theodorakis, 2007). Neurological studies have linked these processes to prefrontal areas in the cortex (Spielberg, Stewart, Levin, Miller, & Heller, 2008). Based on the results of a meta-analyses of 48 functional magnetic resonance imaging studies on cognitive reappraisal of emotions, Buhle et al. (2014) proposed a key role for both the bilateral dorsolateral prefrontal cortex (dlPFC) and ventrolateral prefrontal cortex (vlPFC), indicating that the dlPFC supports the manipulation of appraisals in working memory, while the vlPFC supports the selection and inhibition of appraisals. Nonetheless, it would appear that neurological studies have not yet demonstrated how the specific interaction between cognition and emotions, for instance between extrinsic attributions of failure and the experience of anger, translate to cortical activity. To illustrate, neural bases for explicit emotion regulation have generally focused on reappraisal (e.g., Herwig et al., 2007), whereas other cognitive processes such as attention deployment or response modulation, have not yet been analysed.

What neurological studies have shown about brain functioning is that thinking is not just thinking. They have demonstrated that there are different thought processes: goal-directed thinking (i.e., cognitions deliberately employed towards solving a problem or making progress on a task), spontaneous thinking (i.e., uncontrolled cognitive processes that lack effort, intention, or awareness) and mind-wandering (i.e., task unrelated thoughts) which

occur when we engage in thinking activity (e.g., Fox, Spreng, Ellamil, Andrews-Hanna, & Christoff, 2015). In relation to emotion, spontaneous thinking, which is also regarded as intuitive or System I processing (Kahneman, 2011), could be regarded as the primary cognitive component of emotions (e.g., an athlete thinking “I messed up” after missing an important opportunity); whereas, goal-directed thinking (i.e., controlled cognitive processes that involve effort, intention, and awareness), which is also regarded as rational or System II processing, would refer more to emotion regulation (e.g., the same athlete telling him/herself “You’ll get another chance”; Van Raalte, Vincent, & Brewer, 2016). In sum, cognitive emotion regulation has been studied in metacognitive studies, through which different specific processes, such as attributions or goal-orientation, were described; and in neurological studies which have highlighted specific brain areas related to general processes, such as upregulation or downregulation of emotions, were identified, and different types of thoughts were analysed.

Merging findings from neuropsychology and sport psychology is highly recommended (Abreu & Duarte, 2015), yet, the efforts to integrate sport science and neuroscience have been scarce (for exceptions see Moran, Guillot, MacIntyre, & Collet, 2012). In addition, sport psychology has focused on the cognitive component of emotions almost exclusively from a metacognitive perspective (e.g., Conroy & Metzler, 2004; Martinent & Ferrand, 2015), despite the fact that studying thoughts from a metacognitive perspective has several methodological limitations. Most importantly, all thought-sampling procedures have limitations as they rely on conscious awareness and memory and, therefore, all thought-sampling procedures may access biased memory (Nisbett & Wilson, 1977; Zourbanos, Hatzigeorgiadis, Chroni, Theodorakis, & Papaianou, 2009). However, such procedures provide access to cognitive activation and metacognitive knowledge that cannot be obtained through other methods (Guerrero, 2005). In addition, relating to ecological relevance of research, everyday experiences in applied psychology suggest it is the *content of thought* that coaches and sport psychologists are interested in (Calmeiro & Tenenbaum, 2011; Singer, 2000), more than the neurological underpinnings of these thoughts.

A typical way to access and assess thoughts is via self-talk (Hatzigeorgiadis & Biddle, 2000). Self-talk is one type of thought process, which consists of thoughts with a recognizable syntax (Van Raalte et al., 2016), directed, overtly or covertly (Hardy, 2006), to the self. Therefore, self-talk has been regarded by many researchers, most influenced by Chomsky’s traditional conceptions (e.g., Chomsky, 1966; 2008), as a window into thought (Hinzen, 2013).

The study of automatic self-talk would be one way to link findings from neuroscience to findings from sport psychology, given the fact that the con-

cept itself has emerged from the interaction of research from both areas. Spontaneous and goal-directed thinking are concepts used by Christoff, Gordon, and Smith (2011) in neurological studies, which later have been integrated in metacognitive studies of self-talk to form a model of automatic self-talk in sports (Latinjak, Zourbanos, López-Ros, & Hatzigeorgiadis, 2014). Automatic self-talk, which refers mostly to fast or automatic processes (Evans, 2006), has been defined as self-statements generated by the individual, either consciously or unconsciously, but without previous planning or training (as opposed to strategic self-talk which includes rational-proactive self-talk in interpersonally-designed and planned in advance interventions; e.g., Hatzigeorgiadis, Galanis, Zourbanos, & Theodorakis, 2014).

From a metacognitive point of view, the distinction between spontaneous and rational thoughts has been acknowledged in different theories applied to sports. For example, Rational Emotive Behaviour Therapy (REBT; Ellis, 1957) focuses on irrational versus rational beliefs and how they determine healthy and unhealthy emotions and behaviours (Turner & Barker, 2014). Yet in sport there have been very few studies that have inquired into the patterns of automatic self-talk in emotion-eliciting situations, and most of these studies have targeted solely anxiety (Conroy & Metzler, 2004; Latinjak, Viladrich, Alcaraz, & Torregrosa, 2016; Son, Oregon, & Feltz, 2012). Bases for creating and adapting psychological interventions in sport could be laid by advancing our understanding about what athletes think and say to themselves in emotion-eliciting situations. For instance, when using REBT in applied sport contexts, first irrational beliefs have to be identified before they can be substituted with rational ones (Turner & Barker, 2014). Similarly, an intervention on goal-directed self-talk consists of, first, reflecting on and challenging the athlete's usual goal-directed self-talk and, afterwards, discussing alternative ways of talking to the self (Latinjak, Font-Lladó et al., 2016). Hence, we believe that advancing our knowledge on automatic self-talk could lead to a better understanding of athletes' original thoughts in emotion-eliciting situations and to a better guidance by sport psychologists in the subsequent cognitive interventions.

Regarding the link between automatic self-talk and neuropsychology, researchers (Latinjak et al., 2014) have recently developed a model of automatic self-talk based on the distinction between goal-directed and spontaneous thinking that stemmed from neuropsychological research (Christoff, 2012). Spontaneous self-talk was defined as non-intentional, non-working, non-instrumental statements that come to mind unbidden and effortlessly, but which are linked to the task or activity at hand and relevant contextual stimuli. Contrarily, goal-directed self-talk refers to statements deliberately

employed towards solving a problem or making progress on a task (Christoff, 2012; Ickes & Cheng, 2011).

Current research exploring the relationship between spontaneous self-talk and emotions (Latinjak, Hatzigeorgiadis, & Zourbanos, 2017) compared the valence and time-perspective of spontaneous self-talk between anxiety and anger-eliciting situations in adult athletes. Data indicated that spontaneous self-talk was more positive and future-oriented in anxiety-eliciting situations, whereas in anger-eliciting situations spontaneous self-talk was more negative and retrospective. Despite the relevant contribution to the field, the authors failed to address two relevant points: on the one hand, they did not deal with the content of spontaneous self-talk, which makes it difficult to establish links between what athletes think and the specific emotion-regulation strategies that would fit best. On the other, the authors only studied negative emotions, while research attention is progressively shifting towards to study of positive emotions in sports (McCarthy, 2011). According to McCarthy, positively-valenced emotions, such as euphoria or excitement, are related to superlative performances in sport, and, hence, the study of their nature seems necessary towards making an important contribution to the extant literature.

The purpose of our study was to examine the content of spontaneous self-talk in emotion-eliciting situations, both positive and negative and therefore making a direct contribution to the extant research within these areas. To this end, we believe that understanding the content of spontaneous thoughts in emotion-eliciting situations would eventually help applied sport psychologists develop emotion-specific cognitive interventions. With regards to the selection of specific emotions we explore anxiety and anger, which are negatively-valenced emotions (Jones, Lane, Bray, Uphill, & Catlin, 2005); the former being anticipatory, since it is a reaction to uncertainty and goal-attainment (Robinson & Freeston, 2015); and the latter being retrospective, since it is a reaction to an event interpreted as an offence against myself and mine (Lazarus, 2000). Furthermore, excitement and euphoria are considered positively-valenced emotions (Latinjak, 2012); the former being anticipatory as it is characterized by a strong will to engage in a specific activity (Latinjak, López-Ros, & Font-Lladó, 2014); and the latter being retrospective, since it is a reaction to a success or achievement in the past (Latinjak, López-Ros, & Font-Lladó, 2015). Based on recent research (Latinjak, Hatzigeorgiadis et al., 2017), which has shown a relative congruence between the valence and time-perspective of emotions and spontaneous self-talk, we hypothesized that spontaneous self-talk would be (a) positive and anticipatory with excitement, (b) positive and retrospective with euphoria, (c) negative and anticipatory with anxiety and (d) negative and retrospective with anger.

Method

RESEARCH DESIGN

In accordance with previous studies on automatic self-talk and thoughts in sports (see Hardy, Gammage, & Hall, 2001), we used a descriptive quantitative research design. Further, to assist participants in their recall of the emotion-eliciting situations we embedded qualitative semi-structured interviews. These interviews were designed to provide prompts and cues which help participants to recall the emotion-eliciting situation and specific details in that situation. To analyse participants' qualitative answers, we chose, first, theory- or analyst-driven deductive analyses (Braun & Clarke, 2006) which allow for the verification of our hypotheses and, second, data-driven inductive analyses (Boyatzis, 1998) which allow for exploration beyond previous findings.

PARTICIPANTS AND PROCEDURE

Thirty Spanish male athletes ($M_{\text{age}} = 22.77$, $SD = 4.04$) agreed to participate in this study. At the time of the data collection they were actively competing in soccer ($n = 19$), and basketball ($n = 11$) teams at different national ($n = 7$) and regional levels ($n = 23$). At the time of the data collection, these athletes were all actively engaged in training and competition. Athletes with injuries were not included in the sample.

Further, three research assistants, aged between 22 and 28, participated in the data collection and analyses. They were trained in the data collection procedures, by performing a set of three test interviews, which were analysed and discussed in-group sessions together with the first author. Moreover, the research assistants were not instructed in the purpose of the study, until the data collection had ended. The participants were contacted by the research assistants in their respective sports clubs. Once they agreed to participate in the study, one research assistant met a participant at a location of his convenience. These meetings lasted approximately half an hour. Finally, a group of four experts was assembled to discuss the categories of spontaneous self-talk. These experts were: an applied sport psychologist, a high level coach in team sports, and two researchers specialized in self-talk and emotions with peer-review publications. The experts helped in the data analyses part of this study. Permission to carry out the study was granted from the local ethics committee.

THE THOUGHT-SAMPLING PROCEDURE

The participants were handed a booklet comprising three parts. The first part contained the informed consent form. Once signed, this sheet was removed from the booklet and stored separately. Personal descriptive data were asked in the second part. The third part contained the questions about spontaneous self-talk in each of the four emotion-eliciting situations. Each emotion was presented on a new page of the booklet, together with a set of synonyms in Spanish language. All synonyms refer to the same emotion, and were obtained from the diverse works about emotion concepts in Spanish language (see Latinjak et al., 2014, 2015). The order in which the four pages with the emotions were presented in the booklet was randomized, so

as to distribute the effects of learning and fatigue equally among the four conditions. During its production, the booklet was administered to nine athletes, with similar characteristics to the participants of this study. Each of these athletes commented on the design, length and presentation of the booklet. Their opinions were taken into account at this stage. Specifically, the design of the booklet was changed to highlight better the emotion targeted, and the research assistants changed their position: first they were seated next to the participants, but, to be experienced by the participants as less intrusive, later they sat in front of them.

Emotion-eliciting situations recall. Each page with the questions about spontaneous self-talk in one of the four emotion-eliciting situations was divided into two sections. In Section 1, the participant was asked to remember a recent situation in which they experienced the emotion (i.e., “please try to remember a recent situation in competition when you experienced this emotion”). The participants were instructed to explain it to the research assistant with every possible detail (i.e., “please explain this situation, what events led to it, what happened at this point and what implication did the emotion have for the following events”). For example, one participant when asked about an anger-eliciting situation: “This happened last weekend. We were leading by two goals after only fifteen minutes. It was a corner kick against us, and I had to clear the ball out of the area. I controlled the ball with my chest and hit it away. I was just getting back into my position in the centre of the field when I heard the referee’s whistle blow. Penalty. I played the ball with my hands, he said. I was fuming. On top, yellow card. I could have killed him. From that point on everything went wrong. They scored, and soon after it was two goals each. In the second part, they turned the game around and won the match.” As can be inferred from this example, the participants described the emotion-eliciting situations as well as events prior and following that moment. Nonetheless, when sampling self-talk, the research assistant underlined that the self-talk the participants provided should derive exclusively from the emotion-eliciting situation and not from previous or following situations.

The research assistants were trained to evaluate if the related emotion was identical to the emotion targeted by the instruction. In those cases, where the participant referred to an emotion different to the one we targeted, the research assistant cordially indicated the misunderstanding to the participant and asked him to think of a different situation. Other inclusion criteria for the situations referred to the timing of the emotion. Only emotions which occurred during the competition and during the past month were considered. All participants were able to remember a situation for each emotion which occurred during the three weeks prior to data collection.

Sampling spontaneous self-talk. Once the participant had explained the situation, Section 2 instructed participants to write up to five things they thought or said to themselves in that situation. We chose the written response format because prior pilot studies (e.g., Corbalan-Frigola, Alcoy-Fabregas, Masó, & Latinjak, 2015; Fernandez, Jòdar, & Latinjak, 2015) have shown that verbal responses contain a tangle of different types of information including self-talk and explanations about the situations and why this self-

DATA ANALYSES

The data were analysed by the three research assistants and the first author, in seven consecutive steps. In Step 1, answers were rated as valid or invalid. Invalid answers were explanations about the situation (e.g., “It was a very important game”), about the emotions they experienced (e.g., “I felt really angry”), general answers about what they thought (e.g., “I thought that everything was lost”) and intelligible answers. In Step 2, complex answers were broken into elementary

meaning units. According to Lyons (1981), a meaning unit is an independent statement with significance of its own, and which cannot be further divided without altering its significance. In Step 3, the three research assistants screened the pool of text units and eliminated statements that they perceived as redundant (the participant gave the exact same response twice).

In Step 4, the three research assistants categorized each meaning unit as spontaneous or goal-directed, in accordance to the definitions offered by Christoff et al. (2011). On the one hand, spontaneous self-talk represents emergent thoughts related to the situation and the emotion in it, without a specific purpose of function. On the other hand, goal-directed self-talk represents rational thoughts, used with the purpose of solving the situation or regulating the emotion in it. The research assistants were further reminded that the main difference between the two types of self-talk is intentionality: goal-directed self-talk is used intentionally to make progress on a task and spontaneous self-talk appears unintentionally. In Step 5, the three research assistants categorized each spontaneous meaning unit as positive, negative or either/neither relating to valence, and as anticipatory, retrospective or either/neither relating to time perspective. The research assistants were also reminded that time perspective is related to the statements referent (i.e., the events a statement refers to), and that time perspective does not relate to verbal tense and to the events that trigger the cognitive process. On completion, the inter-rater agreement for Step 4 and Step 5 was calculated. In case of disagreement in either step, the three research assistants and the first author convened to discuss until agreement was reached.

In Step 6, the three research assistants and the first author analysed the content of each category of spontaneous self-talk that resulted of the combination between positive/negative and anticipatory/retrospective. They grouped the meaning units similar in content and proposed secondary categories of spontaneous self-talk, which were sent to the experts. These were evaluated by each expert, and they suggested changes and modifications. Finally, the first author and the experts convened to discuss the secondary categories and agreed upon a final coding scheme. In Step 7, the three research assistants classified each spontaneous meaning unit in the second-order categories of spontaneous self-talk. The three research assistants were debriefed as to the meaning of the secondary categories and were presented with examples to better understand the concepts. The inter-rater agreement was calculated and in case of disagreement, the first author and the three research assistants convened to discuss until agreement was reached. Finally, the primary categories of spontaneous self-talk were compared between the four emotion-eliciting situations. Since our data were codified in nominal variables, Cramer's V coefficient was calculated to explore significant spontaneous self-talk by emotion interaction. Differences between emotions were identified by examination of the standardized residuals for which a value $> \pm 1.96$ represents a significant difference between emotions (Field, 2009).

Results

PREPARATORY ANALYSES

In Step 1, each answer was read and classified as valid or invalid ($n = 14$). Invalid answers were removed and, in Step 2 complex answers were broken down into meaning units. In Step 3, after removing redundant meaning units, the pool of meaning units consisted of 349 valid text units. In Step 4, most meaning units were categorized as spontaneous ($n = 302$; 87%). How-

ever, 47 meaning units were categorized as goal-directed. Inter-rater agreement was 84%. From this point forth, only spontaneous meaning units ($n = 302$) were further analysed.

THE STRUCTURE OF SPONTANEOUS SELF-TALK

In Step 5, all meaning units were classified in nine categories that resulted from the combination of valence and time perspective (three by each primary category): positive, negative or either/neither relating to valence, and as anticipatory, retrospective or either/neither relating to time perspective. Interrater-agreement was 94%. The very few statements classified as either/neither time perspective ($n=20$) had been described, in previous studies (Latinjak et al., 2014), as either situational or contextual. Due to the limited number of these meaning units, we decided to exclude them from further analyses. Moreover, anticipatory spontaneous self-talk was positive, negative or either/neither relating to valence, whereas retrospective spontaneous self-talk appeared to be dichotomic: positive or negative. Afterwards, in Step 6, the model of primary and secondary spontaneous self-talk categories was developed, and, in Step 7, the 282 meaning units left were categorized in their secondary categories. Interrater-agreement was 82%.

Anticipatory-positive self-talk (Ant+; $n = 64$) contained engagement-related statements ($n = 16$; e.g., “I want to play”) and positive projections ($n = 48$; e.g., “There is no way I’ll miss”/ “I’ll win for sure”). Anticipatory-neutral self-talk (Ant=; $n = 38$) contained achievement goals ($n = 11$; e.g., “I hope we’ll win”/ “I have to show what I can do”), doubts ($n = 13$; “Will I be able to win?”/ “What if I lose?”), and avoidance goals ($n = 14$; e.g., “Don’t make a mistake”/ “If you miss we will lose”). Anticipatory-negative self-talk (Ant—; $n = 37$) contained statements related to disengagement ($n = 6$; e.g., “I want to stop”) and negative projections ($n = 31$; e.g., “I’ll play badly”/ “The coach will never rely on me again”). At this point it is worth mentioning arguments related to some decisions made in the categorization process. Achievement goals, doubts and avoidance goals, expressed via self-talk were classified as neutral because they neither represent positive nor negative projections. Instead, at their core they represent uncertainty regarding goal-attainment.

Retrospective-positive self-talk (Ret+; $n = 55$) contained statements related to the consequences of success ($n = 7$; e.g., “Let’s celebrate!”), external attributions of success ($n = 4$; e.g., “I was so lucky”), internal attributions of success ($n = 28$; e.g., “We won!”/ “He couldn’t get past me”) and emotion expression ($n = 16$; e.g., “Yes!”/ “Come here for a big hug!”). Similarly, ret-

rospective-negative self-talk (Ret—; $n = 78$) contained statements related to the consequences of failure ($n = 6$; e.g., “We’ll have to go home now”), internal attributions of failure ($n = 15$; e.g., “I should have passed the ball earlier”), external attributions of failure ($n = 40$; e.g., “Why always me? I’m so unlucky”/ “He’s so blind. No idea how he can find his way back home”) and emotion expression ($n = 17$; e.g., “Shit!”/ “I could kill you!”). It is noteworthy that some statements expressed in the present or future tense were classified as retrospective (e.g., We’ll have to go home now). Therefore, we adhered to the argument made by Latinjak et al. (2014) that the time perspective of spontaneous self-talk does not relate to verbal tense; it relates to the events that trigger the cognitive process (e.g., Having lost the match).

SPONTANEOUS SELF-TALK IN EMOTION-ELICITING SITUATIONS

The Cramer’s V coefficient yielded a significant Spontaneous Self-talk by Emotion interaction (Cramer’s $V = .760$, $p < .001$). In Table I, frequencies and standardized residuals are displayed. The most salient types of self-talk in each emotion-eliciting situation will now be described. Specific examples can be seen in Table II.

In regard to anxiety, most of the 69 spontaneous meaning units relating to anxiety referred to Ant— self-talk ($n = 33$) and Ant = self-talk ($n = 21$). Hence, the athlete’s mind in anxiety-eliciting situations focuses mainly on (a) negative projections, (b) statements related to disengagement, (c) achievement goals, (d) doubts and (e) avoidance goals. In contrast, most of the 85 spontaneous meaning units relating to anger referred to Ret— self-talk ($n = 72$). Hence, the athlete’s mind in anger-eliciting situations focuses mainly on (a) the consequences of failure, (b) internal attributions of failure, (c) external attributions of failure and (d) negative emotion expression.

In regard to positively-valenced emotions, most of the 71 spontaneous meaning units relating to excitement referred to Ant+ self-talk ($n = 48$). Hence, the athlete’s mind in excitement-eliciting situations focuses mainly on engagement-related statements and positive projections. Nonetheless, there was also some Ant= self-talk ($n = 12$), including doubts and achievement goals. Lastly, most of the 77 spontaneous meaning units relating to euphoria referred to Ret+ self-talk ($n = 52$). Hence, the athlete’s mind in euphoria-eliciting situations focuses mainly on consequences of success, internal attributions of success, and positive emotion expression. Additionally, a relatively large part of spontaneous self-talk in euphoria-eliciting situations was also Ant+ ($n = 14$). In particular, there were positive projections.

TABLE I
Primary Spontaneous Categories: Examples, Frequencies and Standardized Residuals for each Emotion-eliciting Situation

Time perspective	Valence	Example	Total	Anxiety	Anger	Excitement	Euphoria
			<i>n</i>	<i>n</i> (<i>se_i</i>)	<i>n</i> (<i>se_i</i>)	<i>n</i> (<i>se_i</i>)	<i>n</i> (<i>se_i</i>)
Anticipatory	Positive	"I can win/ Let's start"	64	1 (-3.6)	1 (-4.0)	48 (8.5)	14 (-0.6)
	Either/neither	"I have to score"	38	21 (4.2)	3 (-2.4)	12 (1.0)	2 (-2.5)
	Negative	"They will hate me"	37	33 (8.4)	3 (-2.3)	0 (-2.9)	1 (-2.7)
Retrospective	Positive	"Yes! / I did it!"	55	0 (-3.5)	0 (-3.9)	3 (-2.8)	52 (10.1)
	Negative	"I'm so unlucky"	78	5 (-3.0)	72 (10.7)	0 (-4.3)	1 (-4.2)

TABLE II
Examples of spontaneous self-talk sequences in the four emotion-eliciting situations.

Emotion	Examples of spontaneous self-talk sequences
Anxiety	"They'll beat me (Ant—: negative projection). I'll make a fool out of myself (Ant—: negative projection). Please, let it be over soon (Ant—: disengagement)". "I'm not sure if I'll remember how to do this during the match (Ant—: negative projection). I can't lose the ball in this area; it would lead to a dangerous counterattack (Ant=: avoidance goal). If I play poorly I'll never play again (Ant—: negative projection). The coach said that the forward can head-strike very well. Will I be able to stop him (Ant=: doubts)? And what if I miss (Ant=: doubts)?"
Anger	"What have you done? Not now! (Ret—: internal attribution). Why always me; so unfair (Ret—: external attribution). Shit! (Ret—: emotion expression). And the coach always picks the senior players, never us younger ones (Ret—: external attribution)". "I want to kill him (Ret—: emotion expression). You are so useless. Damn referee (Ret=: external attribution). And how come that a team much better than us has to play so foul (Ret—: external attribution)". "I should have scored the last time (Ret—: internal attribution). We could have been the national champions. Now we are nothing (Ret—: consequences). Why does this happen to me (Ret—: external attribution)?"
Excitement	"I really want to go out there and play (Ant+: engagement). I will repeat the celebrations (Ant+: positive projection). I want the game to start now (Ant+: engagement)". "Let's go for it (Ant+: engagement). We'll reap the rewards of a year's work (Ant+: positive projection). We'll show that it is not just chance that we are where we are (Ant+: positive projection)".
Euphoria	"It went in where I wanted it to go in, and in the only spot it could go in (Ret+: internal attribution). Celebration! (Ret+: emotion expression)". "Come on, yes (Ret+: emotion expression)! I knew it; very good (Ret+: emotion expression)! You are a champ, I knew I could do it (Ret+: internal attribution). I want to try again (Ant+: engagement)". "Come on, we can win this game (Ant+: positive projection on performance). Now we will destroy them (Ant+: positive projection on results). Yes (Ret+: emotion expression)!"

Discussion

The purpose of our current study was to uniquely explore the content of spontaneous self-talk in positively- and negatively-valenced emotion-eliciting situations and hence add to the extant self-talk literature. First, our hypothe-

ses were confirmed as valence and time-perspective of emotions and spontaneous self-talk generally coincided: most spontaneous self-talk was positive and anticipatory with excitement, positive and retrospective with euphoria, negative and anticipatory with anxiety and negative and retrospective with anger.

Generally, data suggest that emotions and spontaneous self-talk are connected on different levels. Most spontaneous self-talk categories, such as positive or negative projections (“I will win/ I can make a fool of myself”), achievement or avoidance goals (“I hope I score/ They can’t pass me”), doubts (“What if I lose?”), or internal or external attribution of success or failure (“It’s my fault/ I was so lucky”) could be either/or antecedents or consequences of emotions. Engagement- and disengagement-related spontaneous self-talk (“Let’s start/ I want to go home”) are most likely consequences of emotion, whereas emotion expression through spontaneous self-talk (“I want to celebrate! / I could kill him”) could be seen as part of the emotional experience (Fontaine, Scherer, Roesch, & Ellsworth, 2007). These contrasting interpretations of the relations between emotions and spontaneous self-talk are consistent with the diversity of theories about cognition and emotions. According to cognitive-motivational-relational theory, spontaneous self-talk could be an antecedent of emotions (Lazarus, 2000); according to the constructivist view of emotions, spontaneous self-talk could be a correlate of the emotional experience (Lindquist, 2009); and according to dual-processing theories, spontaneous self-talk would be a reaction to emotions (Van Raalte et al., 2016). Consequently, our results partly support all previously mentioned theories and indicate that the links between emotions and cognitions are most likely to be represented as a conceptual tangle of antecedents (e.g., telling myself that “I believe that I will lose” leads to anxiety), correlates (e.g., thinking of abandoning sport while being angry) and consequences (e.g., euphoria leading me to tell myself that “I am better than others”).

Acknowledging the numerous efforts undertaken during more than two decades to define and describe what self-talk is (e.g., Bunker, Williams, & Zinsser, 1993; Hardy, 2006; Van Raalte et al., 2016), our findings indicate that it might be timely to explore the conceptual boundaries of self-talk. Our results indicate that self-talk and emotions are partly overlapping concepts. According to Russell’s perspective on the psychological construction of emotions (Russell, 2009), spontaneous self-talk could be an expressive of components such as appraisal and attribution that jointly with facial movement, vocal tone, peripheral nervous system change, behaviour, subjective experience and emotion regulation constitute an emotional experience.

With regard to anxiety, our results indicated high levels of negative anticipation, which, in turn, can be related to lower levels of self-efficacy. This result suggests that self-efficacy building interventions (e.g., Jenny, Munroe-Chandler, Hall, & Hall, 2013) could be beneficial to cope with the cognitive component of anxiety-eliciting situations. Hence, it is not surprising that goal-directed self-talk in anxiety-eliciting situations is often focusing on positive projections (“You can do it”) and creating deactivated states (“calm down”; Latinjak, Hatzigeorgiadis et al., 2017). In addition, Hatzigeorgiadis et al. (2007) have evidenced that anxiety-controlling self-talk, which consisted of cue-words such as “calm down” or “relax”, could efficiently reduce cognitive anxiety. Lastly, focusing attention on performance knowledge using instructional self-talk could be another way to cope with athletes’ negative anticipation. Nonetheless, these self-delivered technical instructions in anxiety-eliciting situations should rather focus on distal external focus of attention than on internal focus of attention (Bell & Hardy, 2009).

Nonetheless, our results also indicated a large number of neutral-anticipatory statements. This result is in line with a previous study about spontaneous self-talk in anxiety-eliciting situations (Latinjak, Hatzigeorgiadis et al., 2017). Together, these results offer firm support to theoretical considerations (Russell & Barrett, 1999) and empirical findings in the area of affect (Fontaine et al., 2007), which suggested that anxiety could be experienced as more positive compared to other negative emotions, for instance anger. Additionally, some of these neutral and negative statements that contained avoidance goals (“I cannot lose”) and negative projections (“I will never beat this guy”) show irrational beliefs. In this regard, RBET interventions in sport have been shown to significantly reduce irrational thoughts in athletes (Turner, Slater, & Barker, 2014).

In regard to anger, our results indicated that cognitions are predominantly negative and retrospective. Generally, that result suggests that interventions with cognitive reappraisals (“Everyone can make mistakes”) could be beneficial to change the valence of retrospective thinking (Ray et al., 2008); or interventions focusing on technical and tactical instructions (“Keep your back straight next time”) could be beneficial to turn retrospective into present-related thinking (Latinjak, Torregrosa, & Renom, 2009). In relation to the latter, instructional self-talk interventions have been proven to be efficient directing or redirecting focus of attention on task-relevant stimuli (Landin & Hebert, 1999).

In relation to excitement, our results indicated predominantly positive-anticipatory self-talk. On the one hand, interventions consisting of positive future-related thinking could be beneficial to promote excitement (Schunk,

1995); on the other, when excitement is debilitating (Hanin, 2007), anticipatory-neutral thoughts could be prompted through goal-setting (Locke & Latham, 2002) or attention could be drawn to the present through interventions focusing on technical and tactical instructions (Landin & Hebert, 1999).

Regarding euphoria, most spontaneous self-talk observed was positive and retrospective. When euphoria is debilitating (Hanin, 2007), then attention could be drawn to the present through interventions focusing on technical and tactical instructions (Landin & Hebert, 1999). Further, interventions with cognitive reappraisal could be beneficial to change the valence of retrospective thinking (Ray et al., 2008). In their exploratory study, Latinjak et al. (2014) described statements targeted to relativize positive-retrospective thoughts relating to success (“Even though you won today, you’ve also been the loser many times”; p. 554).

The data sampling strategy and the categorization procedure could be considered limitations of this study, as so far as they have to be taken into consideration when interpreting our results. First, the self-talk sampling protocol might have caused biased memory, due to the time elapsed since the actual situations took place. However, as Nisbett and Wilson (1977) postulated, all thought-sampling procedures have limitations as they rely on conscious awareness and memory. Our data would appear to be in-line with previous findings regarding the structure of spontaneous self-talk and its interactions with anxiety and anger (e.g., Latinjak et al., 2014; Latinjak, Hatzigeorgiadis et al., 2016), and therefore strengthened our confidence and provided indirect support for the integrity of the thought-sampling procedure.

Second, in this study, the participants’ ratings of spontaneous self-talk were not taken into consideration. Van Raalte et al. (2014) evidenced that self-talk ratings made by participants could be distinguished from those made by researchers. Moreover, Latinjak, Hatzigeorgiadis et al. (2017) calculated participant-rater agreement and concluded that agreement between participants and the judges was acceptable but modest. Hence, in the present study, it should be acknowledged that results might have been slightly different, mostly because there are interpretive elements associated with the content of self-talk (Hardy, 2006) the raters could not account for. Yet, the alignment of our results with previous findings that used participant-ratings (Latinjak, Hatzigeorgiadis et al., 2017) and with theoretical predictions strengthen our confidence on the data categorization procedure.

Despite the limitations of this current study, the results have potential implications for practice. First of all, spontaneous self-talk can be under-

stood as a window into the athlete's mind. Listening to their spontaneous self-talk can tell coaches and applied sport psychologists about the athlete's performance beliefs ("I can score"), goal-orientations ("I don't want to lose"), irrational beliefs ("I have to win"), thoughts of disengagement ("I want to stop"), and attributions of success ("I am the best") and failure ("He didn't pass the ball"). Moreover, since spontaneous self-talk is linked to emotions, knowing the content of their self-talk points towards feasible interventions to help them regulate their emotions. For example, since anxiety is linked to irrational beliefs, REBT interventions could help the athlete to better self-regulate (e.g., Turner & Barker, 2014).

Athletes' spontaneous self-talk varies according to the emotions they experience. This result suggests that the specific content of spontaneous self-talk could be important to design self-regulation strategies to cope with distinct emotions. Four emotions have been studied, and specific interventions have been suggested for each one which require further empirical ecological exploration. This study is the first to explore the content of spontaneous self-talk in positively-valenced emotions, in addition to the negatively-valenced ones. Nonetheless, taking into account the large variety of emotional experiences in sport (Latinjak, 2012), future researchers should inquire into other emotions, for example, interpersonal ones like shame or hate, or deactivated ones, like boredom or relaxation. Over time, this line of research has the potential to enable applied sport psychologists to adapt their interventions to the spontaneous reactions of the mind to emotions, and, the other way around, to understand emotions by listening to athletes' spontaneous self-talk.

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