A Multimethod Examination of the Relationship Between Coaching Behavior and Athletes’ Inherent Self-Talk

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The aim of the present research was to investigate the relationship between coaching behavior and athletes’ inherent self-talk (ST). Three studies were conducted. The first study tested the construct validity of the Coaching Behavior Questionnaire (CBQ) in the Greek language, and provided support for its original factor structure. The second study examined the relationships between coaching behavior and athletes’ ST in field, with two different samples. The results showed that supportive coaching behavior was positively related to positive ST (in one sample) and negatively related to negative ST (in both samples), whereas negative coaching behavior was negatively related to positive ST (in one sample) and positively related to negative ST (in both samples). Finally, the third study examined the relationships experimentally, to produce evidence regarding the direction of causality. The results showed that variations in coaching behavior affected participants’ ST. Overall, the results of the present investigation provided considerable evidence regarding the links between coaching behavior and athletes’ ST and suggested that coaches may have an impact on athletes’ thoughts.

Keywords: positive and negative thoughts, coach, antecedents of self-talk, significant others, coach-athlete dynamics

The influence of the environment in the process of thinking is an area of great interest. The relationship between social mind and personal mind (Lawrence & Valsiner, 2003) has a long history in psychology. At the beginning of the last century, Cooley (1902) and Mead (1912/1964) addressed the important role of social environment on the formulation of individuals’ thoughts suggesting that one can engage in thoughts by internalizing others’ perspective. Glass and Arnkoff (1997) described thoughts as cognitive products often referred to as self-statements, self-talk, automatic thoughts, or internal dialogue. Self-talk (the term that has prevailed in sport psychology) has attracted a great deal of interest in the contemporary literature. Nevertheless, research has primarily focused on the effectiveness of self-talk...
(ST) interventions on performance (Hatzigeorgiadis, Theodorakis, & Zourbanos, 2004; Theodorakis, Weinberg, Natsis, Douma, & Kazakas, 2000) and recently has examined the functions through which ST affects performance (Hatzigeorgiadis, Zourbanos, Mpoumpaki, & Theodorakis, 2009; Theodorakis, Hatzigeorgiadis, & Chroni, 2008). Thus, there is a dearth of research addressing the factors that shape and influence athletes’ inherent ST (Conroy & Metzler, 2004).

Hardy, Oliver, and Tod (2009) presented a conceptual model suggesting two broad dimensions of ST antecedents; personal and situational. According to Hardy and colleagues, personal antecedents consists of factors such as individual’s cognitive processing preferences (Thomas & Fogarty, 1997), individual’s belief in ST (e.g., Oikawa, 2004) and individual’s personality (e.g., Conroy & Metzler, 2004), anxiety (Conroy & Metzler, 2004; Hatzigeorgiadis & Biddle, 2008), and achievement goal orientations (Harwood, Cumming, & Fletcher, 2004; Hatzigeorgiadis & Biddle, 2002). Situational antecedents consists of factors such as task difficulty (e.g., Fernyhough & Fradley, 2005), match circumstances (e.g., Van Raalte, Cornelius, Brewer, & Hatten, 2000), coaching behavior (e.g., Zourbanos, Theodorakis, & Hatzigeorgiadis, 2006) and competitive setting (e.g., Hardy, Hall, & Hardy, 2005). In concluding their review, Hardy et al. stressed the need for further research on ST antecedents. Similarly, Conroy and Metzler (2004) suggested that determining the origins of ST should become a priority in sport psychology research. The purpose of the present investigation was to explore, according to Hardy et al.’s model, one of the situational antecedents of ST, coaching behavior.

Coker, Fischman, and Oxendine (2006) noted that effective coaches have been described as “coaches who must have excellent knowledge of their sport and be innovative strategists, skilled motivators, and effective personal counselors. First and foremost, effective coaches must be good teachers” (p. 17). Given the important role that coaches play, different theories and models have been proposed to examine coaching effectiveness. Smith, Smoll, and Hunt (1977) developed the Coaching Behavior Assessment System—CBAS an observational tool that measures overt coaching behaviors. Smith and Smoll studies using the CBAS concluded that coaches’ behavior depicting instruction, praise and encouragement was associated with greater sport enjoyment. Based on the CBAS and the behaviors that were identified, Smoll and Smith (1989) proposed a mediational model of leadership which suggests that coaching behavior influences athletes’ evaluative reactions and sport experience, through athletes’ perceptions of the meaning ascribed to this behavior. This leadership framework captures the dynamic relationships between athletes and coaches taking into perspective individual characteristics, and situational factors. Smith and Smoll (2007) reported evidence that feedback and behaviors that the coaches establish can affect athletes’ development, performance, and perceptions. In particular, they reported that in intervention studies applying coach effectiveness training, coaching behavior was found to increase young athletes’ self-esteem and enjoyment, and to decrease anxiety. In addition, Williams et al. (2003) found that supportive coaching behavior was positively related to self-confidence and negatively related to cognitive anxiety, whereas negative activation was negatively related to self-confidence and positively related to cognitive anxiety. The above findings provide a basis for the investigation of the links between coaching behavior and athletes’ cognitions.

The relationship between the social environment and individuals’ cognitive concepts has been supported by many researchers in different areas of psychological...
research and especially in educational settings showing that teachers’ behavior influences students’ ST (e.g., Burnett, 1996, 1999). Mead (1912/1964) regarding inner speech and self-awareness, noticed that one can engage in ST by internalizing others’ perspective. Furthermore, Morin (2004, 2005) in his socioecological model of self-awareness proposed that ST could serve as a mean of self, through which the individual can verbally identify private and external self-information. In sport psychology, the likely relationship between coaches’ behavior and athletes’ ST, were first examined by Zourbanos et al. (2006). In a preliminary investigation they reported positive relationships between coaches’ supportiveness and athletes’ positive thinking, and also between coaches’ negative activation and athletes’ negative thinking. However, in this study athletes’ ST was assessed using the subscales of positive and negative ST from Test of Performance Strategies-TOPS-2. The scale is designed to assess the use of ST as a cognitive strategy among other strategies such as goal setting and imagery. For example an item from the ST subscale is “I say things to myself to help my practice performance,” which assesses in general the use of positive thinking and not the content of athletes’ inherent ST which reflect the variety of thoughts that athletes experience during training or competition (for review, see Hardy et al., 2009; Zourbanos, Hatzigeorgiadis, Chroni, Theodorakis, & Papaioannou, 2009). Zourbanos et al. (2009) developed a comprehensive instrument for the evaluation of athletes’ ST. Their investigation supported the multidimensionality of athletes’ ST and revealed eight distinct ST dimensions, four positive (psych up, confidence, anxiety control, and instruction), and four negative (worry, disengagement, somatic fatigue, and irrelevant thoughts). Two theoretical frameworks in the sport psychology literature, Hardy et al.’s (2009) prospective framework for the study of ST (from the ST perspective) and Smoll and Smith’s (1989) mediational model of leadership (from the coaching behavior perspective), attest for the influences coaching behavior may have on athletes’ cognitions. Based on these frameworks and in line with previous findings (Zourbanos et al., 2006) the current study extends research by combining correlational and experimental based evidence. The purpose of this study was threefold. First, to examine the construct validity of the CBQ (Williams et al., 2003) in the Greek language; second, to examine in field the relationships between coaching behavior and athletes’ ST; third, to provide experimental evidence for the impact of coaching behavior on athletes’ ST.

**Study 1**

With regard to the assessment of coaching behavior, and almost in parallel with the development of the CBAS, Smith, Smoll, and Curtis (1978) developed the Perceived Behavioral Scale (PBS) an instrument assessing athletes’ perceptions of coaching behavior. Shaver (1975) suggested that one’s perceptions of another’s behavior are more important than the behavior itself, because it is the perception that may have the impact and not the behavior per se. Furthermore, Smith and Smoll (2007) reported that perceived behavior has yielded stronger relationships with outcome variables than observed behavior. Therefore, the importance of assessing athletes’ perception becomes apparent.

In a critique of the PBS, Chelladurai and Riemer (1998) noticed that because of the form of the scale (single-item scale) no conclusions regarding its construct
validity could be made and thus the relevant findings should be viewed with caution. Subsequently Kenow and Williams (1993, 1999) on the basis of the CBAS developed the Coaching Behavior Questionnaire (CBQ), a more comprehensive instrument for the assessment of several aspects of coaching behaviors. In a more recent examination of the CBQ structure (Williams et al., 2003), through exploratory and confirmatory analyses, two broad dimensions of coaching behavior emerged: emotional composure/supportiveness and negative activation. Williams et al. (2003) noticed that CBQ incorporates not only actual coaching behaviors but also athletes’ evaluative reactions to the behaviors a central component in Smoll and Smith’s (1989) mediational model.

The CBQ consists of 22 items assessing supportiveness/emotional composure (8 items), negative activation (7 items) and 7 items of noncoaching behaviors. For the purposes of the current study we examined the two dimensions of coaching behavior proposed by Williams et al. namely negative activation (negative behavior) and supportiveness/emotional composure (positive behavior). The noncoaching items that Williams et al. used in their scale were not included, so the scale would be shorter and flexible for use under difficult circumstances such as before or after competition, in which athletes face serious time pressure.

Thus, the purpose of Study 1 was to examine the construct validity of the Greek version of the CBQ (Williams et al., 2003). Zourbanos et al. (2006) first translated the instrument in the Greek language. Preliminary examination of the factor structure through confirmatory factor analysis supported a 2-factor, 13-item solution. The results showed that the error variance of two items (one from each dimension) was highly correlated with error variance of various other items. Zourbanos et al.’s (2006) study was a preliminary evaluation of the CBQ using a small sample. The purpose of this study is to further improve and confirm structure and the items of the measure in the Greek language. In the current study the translation of the two items that were excluded was reconsidered and a 15-item model as originally published by Williams et al. (2003) was retested for further validation.

**Method**

**Participants and Procedure**

Five hundred forty-eight athletes (197 females and 351 males) with a mean age of 17.69 years (SD = 4.22) participated in the study. They were recruited from basketball (n = 36), gymnastics (n = 28), swimming (n = 67), soccer (n = 50), water polo (n = 21), track and field (n = 243), volleyball (n = 48), and tennis (n = 55). Participants had an average competitive experience of 5.94 years (SD = 3.60). The coaches had been working with their athletes between 1 and 14 years (M = 4.16, SD = 2.69). Participants were actively competing at club or regional level (n = 162), national level (n = 306), and international level (n = 80). After providing informed consent, athletes completed their perceptions of coaches’ behavior under the supervision of the authors, without the presence of the coach, in practice sessions before the warm-up period. Permission to conduct the study was obtained by the institution’s research ethics committee.
Measures and Analysis

**Coaching Behavior Questionnaire.** To assess coaches’ behavior, the coaching behavior dimensions that were used in Williams et al.’s (2003) study were administered to capture the two identified dimensions, namely supportiveness/emotional composure (8 items, e.g., My coach displays confidence in me as a player) and negative activation (7 items, e.g., My coach’s behavior during a game makes me worry about my performance). Participants responded on a 4-point Likert scale anchored by *Strongly disagree* (1) and *Strongly agree* (4) and were asked to indicate their perceptions of their coaches’ behavior during training and competition.

The factor structure of the coaching behavior questionnaire was tested through confirmatory factor analysis (CFA) using the EQS 6.1 (Bentler & Wu, 2004). Three fit indices were used to assess the adequacy of the tested model: the comparative fit index (CFI), the incremental fit index (IFI), and the root mean square error of approximation (RMSEA). Values greater than 0.90 for the IFI and the CFI, are considered to be indicative of adequate fit, although values approaching the 0.95 are preferable (Hu & Bentler, 1999), whereas values smaller than .08 and close to .05 for the RMSEA are considered supportive of good fit.

**Results and Conclusions**

Two alternative models were tested. One where the original two-factor structure was tested, with the two factors allowed to correlate, and one where all items were hypothesized to load on a single coaching behavior factor. The results provided adequate support for the two-factor model ($\chi^2 / df = 259.66 / 89$, CFI = .92, IFI = .92, RMSEA = .06), but not for the one-factor model ($\chi^2 / df = 814.62 / 90$, CFI = .66, IFI = .66, RMSEA = .12). Factor loadings for the two-factor model ranged from .49 to .74, with the exception of one item (My coach is appropriately composed and relaxed) that had a loading of .27 (which, however, was significant). The removal of this item would not improve the fit of the model; therefore, considering that the fit was acceptable the item was retained to sustain content validity. The correlation between the two factors was -.44. Finally, Cronbach’s alpha coefficients for the supportiveness/emotional composure and negative activation were .83 and .84 respectively.

The results of the first study provided supportive evidence for the construct validity of the Greek version of the Coaching Behavior Questionnaire. The factor structure was similar to Zourbanos et al.’s (2006) preliminary study, in which the instrument was initially translated into Greek and tested in a smaller sample. Furthermore, the items that were reworded compared with the Zourbanos et al. study seem to fit better with the remaining items, and produced an instrument matching better the original CBQ. In sum, the results of the 2-factor model showed good internal consistency and factorial validity, indicating that can be an effective measure for examining coaches’ behavior with Greek samples.

**Study 2**

The purpose of the second study was to examine the relationship between coaching behavior and athletes’ ST in field, based on (a) Smoll and Smith’s model (1989) on the effects of coaching behavior on different outcomes (Smith & Smoll, 2007) and
Coaching Behavior and Athletes’ Inherent Self-Talk 769

(b) on Hardy et al.’s (2009) model regarding the situational antecedents of ST, such as coaching behavior (e.g., Zourbanos et al., 2006). Two correlational studies have provided preliminary evidence for the relationships between coaching behavior and athletes’ ST. Zourbanos et al. (2006) reported that supportive coaching behavior was positively related to positive ST and negatively related to negative ST, whereas negative coaching behavior was positively related to negative ST. Furthermore, Zourbanos, Hatzigeorgiadis, and Theodorakis (2007) reported that supportive coaching behavior was positively related to positive ST, whereas negative coaching behavior was related to negative ST. Nevertheless, in that study a provisional instrument was used to assess athletes’ ST, thus these findings should be also considered preliminary. The present study aimed to extend these findings (a) through the use of a validated ST instrument capturing the multidimensional structure of athletes’ ST, (b) by testing the relationships between coaching behavior and athletes’ ST using a trait approach in a noncompetitive setting (assessing athletes perceptions of recent competitive experiences), but also a state approach in a competitive setting (assessing athletes perceptions in just completed competition), and (c) by assessing coaches’ perceptions of their own behavior to test the correspondence between coaches’ and athletes’ perceptions, and the relationships between coache’s perceptions of their own behavior and athletes’ ST. This was based on Smoll and Smith’s approach, who used CBAS’s overt coaching behaviors and coaches’ ratings of how frequently they perform the behaviors. The rationale of this methodology was based on the fact that when an independent variable is examined by different persons, this might produce more information on coaching behaviors than when is examined only from the players’ perspective (Campbell, 1977). Furthermore, this sort of data would provide further evidence for the convergent validity of the CBQ.

Based on the preliminary findings of Zourbanos et al. (2006, 2007) positive relationships between coaching behavior and ST dimensions of respective valence were expected. Furthermore, because an inverse correlation between negative activation and positive ST was identified, negative relationships between dimensions of opposite valence were also considered likely; these were expected to be of lower magnitude. More specifically, it was hypothesized that (a) coaches’ supportiveness would be positively related to athletes’ positive ST and negatively to athletes’ negative ST, and (b) coaches’ negative activation would be positively related to athletes’ negative ST, and negatively related to athletes’ positive ST. It should be noticed that more specific hypotheses regarding the self-talk dimensions were not made because this was the first study to use the ASTQS and the aim was to explore the relationships between the different subscales of the CBQ and the newly developed ASTQS. Finally, it was expected that athletes and coaches’ perceptions regarding coaching behavior would have at least moderate correlations, and accordingly, coaches’ perceptions of their own behavior would correlate with athletes’ ST following the pattern of hypotheses (a) and (b).

Method

Participants and Procedure

For the purposes of the second study two different samples were tested. The first sample consisted of 112 wrestlers, with a mean age of 20.71 years ($SD = 3.07$).
Participants were actively competing at regional level \((n = 19)\), national level \((n = 71)\) and international level \((n = 22)\). They had an average competitive experience of 6.94 years \((SD = 3.69)\), they were training for an average of 9.30 \((SD = 2.87)\) hours per week, and they had been training with their current coaches for an average 6.46 \((SD = 3.62)\) years. A trait approach was adopted for this sample. Participants were asked to rate their coaches’ behavior and their ST during their latest competitions. Questionnaires were completed under the supervision of one of the authors, in the absence of the coach, in practice sessions before the warm-up period. All participants signed a consent form.

The second sample consisted of 60 wrestlers, with a mean age of 18.95 years \((SD = 1.52)\). Participants were actively competing at regional level \((n = 13)\), national level \((n = 37)\) and international level \((n = 10)\). They had an average competitive experience of 5.30 years \((SD = 2.31)\), they were training for an average of 9.45 \((SD = 3.51)\) hours per week, and they had been training with their current coaches for an average 5.50 \((SD = 2.49)\) years. A state approach was adopted for this sample. Questionnaires were completed at the site of the competition, within 30 min after the completion of a match. Participants were asked to report their perceptions regarding their coaches’ behavior and the content of their ST during the just completed match. The questionnaires were again completed under the supervision of one of the authors in the absence of the coach. In addition, coaches \((N = 42)\) rated their own behavior during the competition for each match with regard to each athlete, so that for each athlete there was an own score regarding coaching behavior and a coach score regarding coaching behavior. Coaches rated their behavior for the specific match within 30 min after the completion of the match. All participants signed a consent form.

**Measures and Analyses**

**Coaching Behavior Questionnaire.** To assess perceived coaches’ behavior the measure described in Study 1 was used. Moreover a coach version questionnaire (CBQ-C) was also used to assess coaches’ perceptions of their own behavior. The items were modified accordingly. For example, for the CBQ item “During the match, my coach was appropriately composed and relaxed,” the corresponding item in the CBQ-C was, “During the match, I was appropriately composed and relaxed.”

**Self-Talk.** The Automatic Self-Talk Questionnaire for Sports-ASTQS (Zourbanos et al., 2009) was administered to assess athletes ST. The instrument consists of 40 items assessing four positive (19 items) and four negative (21 items) ST dimensions. Positive ST consists of the dimensions of confidence (e.g., I believe in myself), anxiety control (e.g., Keep calm), psych up (e.g., Do your best), instruction (e.g., Concentrate on what you have to do right now). Negative ST consists of the dimensions of worry (e.g., I will lose), disengagement (e.g., I want to quit), somatic fatigue (e.g., I feel tired), and irrelevant thoughts (e.g., I am hungry). Participants were asked to indicate the frequency of their ST content on a 5-point scale \((0 = never, 4 = very often)\). Zourbanos et al. (2009) supported the psychometric integrity of an eight-factor model with eight distinct dimensions of thoughts (as reported above), but also of a 10-factor model, where the eight first-order factors forming two higher-order factors representing positive and negative ST dimensions. Accordingly, in the current study athletes’ ST was examined with both methods (eight individual factor scores and overall positive and negative ST scores).
Simple correlations were calculated to test magnitude of the relationships between perceptions of coaching behavior and athletes’ ST. In addition, partial correlation were calculated, partialing out match outcome (Van Raalte et al., 2000) to control for the effect of outcome on the relationship between coaching behavior and athletes’ ST.

**Results and Conclusions**

**Sample 1**

Means, standard deviations, and Cronbach’s alpha coefficients are presented in Table 1, whereas correlations between coaches’ behavior and athletes ST dimensions are reported in Table 2. All scales showed high internal consistency (Cronbach’s alpha ranging from .81 to .90) except from athletes’ irrelevant thoughts, which demonstrated lower (.64), but still acceptable (Aiken, 1996) internal consistency.

In accordance with hypothesis (a), the results showed that supportiveness was positively related to athletes’ positive ST (overall score) and negatively related to athletes negative ST (overall score). With regard to the individual ST dimensions, positive coaching behavior had larger positive correlations with athletes’ positive ST referring to confidence, anxiety control and psych up, and smaller with instruction,

<table>
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<th>Table 1</th>
<th>Descriptive Statistics and Alphas for All the Examined Variables of Study 2</th>
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<td>Sample 1</td>
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<td>( n = 112 )</td>
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<td>ASTQS</td>
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<td>Psych Up</td>
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<td>Confidence</td>
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<td>Instruction</td>
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<tr>
<td>Disengagement</td>
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<tr>
<td>Worry</td>
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<td>Irrelevant Thoughts</td>
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<td>Worry</td>
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<td>Irrelevant Thoughts</td>
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**CBQ**

Athletes’ Perceptions
- Supportiveness \( M = 3.05, SD = .45, \alpha = .74 \)
- Negative Activation \( M = 2.03, SD = .54, \alpha = .76 \)

Coaches’ Perceptions
- Supportiveness \( M = 3.05, SD = .53, \alpha = .89 \)
- Negative Activation \( M = 1.95, SD = .56, \alpha = .91 \)
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<tr>
<th>Measure</th>
<th>Sample 1 (n = 112)</th>
<th>Sample 2—After Competition (n = 60)</th>
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<tr>
<td>ASTQS</td>
<td>Supportiveness^a</td>
<td>Negative Activation^a</td>
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<td>Psych Up</td>
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<td>-.28**</td>
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<tr>
<td>Confidence</td>
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<td>-.26**</td>
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<td>Instruction</td>
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<td>Anxiety Control</td>
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<td>Somatic Fatigue</td>
<td>-.22*</td>
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<td>Disengagement</td>
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<td>Worry</td>
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<td>.40**</td>
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<td>Irrelevant Thoughts</td>
<td>-.20*</td>
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<td>Broader ST Dimensions</td>
<td>Positive Self-Talk</td>
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<td>Negative Self-Talk</td>
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Note. Partial correlations controlling for match outcome appear in parentheses.

^aAthletes’ perceptions of coaches’ behavior. ^bCoaches’ perceptions of their own behavior.

*p < .05, **p < .01.
whereas with athletes’ negative ST dimensions, positive coaching behavior had moderate negative correlation with disengagement and low negative correlations with somatic fatigue, irrelevant thoughts and worry.

In accordance with hypothesis (b), the results revealed that negative activation was positively related to athletes’ negative ST (overall score) and negatively related to athletes positive ST. With regard to the individual ST dimensions for negative ST, negative coaching behavior had larger positive correlations with thoughts referring to disengagement and somatic fatigue and lower on irrelevant thoughts and worry, whereas with athletes’ positive ST, negative coaching behavior had similar low negative correlations with all the positive ST subscales. In general, correlations analysis revealed moderate relationships between coaching behavior and athletes’ ST.

Sample 2

Means, standard deviations and Cronbach’s alpha coefficients are presented in Table 1, whereas correlations between perceived coaching behavior and athletes ST are reported in Table 2. All scales showed adequate internal consistencies (alpha coefficients ranging from .77 to .92).

Regarding hypothesis (a), the results were partially in accordance with our hypotheses, showing that supportiveness had a low positive correlation with athletes’ positive ST (overall score) and a moderate negative correlation with athletes negative ST (overall score). With regard to the individual ST dimensions, positive coaching behavior had a low correlation with the confidence ST dimension, and nonsignificant correlations with the other subscales, whereas with athletes’ negative ST, positive coaching behavior had similar moderate negative correlations with all the negative ST dimensions. Regarding hypothesis (b), the results were partially in accordance to our hypotheses, showing that negative coaching behavior had a moderately high positive correlation with athletes’ negative ST (overall score), but also a nonsignificant positive correlation with positive ST (overall score). With regard to the individual ST dimensions for negative ST, negative coaching behavior had larger positive correlations with thoughts referring to disengagement and somatic fatigue and lower with irrelevant thoughts and worry; surprisingly negative coaching behavior had low positive, but not significant, correlations with all the positive ST subscales, ranging from \( r = .03 \) to \( r = .22 \).

Controlling for match outcome, through partial correlations, slightly dropped the magnitude of the correlations between positive coaching behavior and negative ST, which however remained moderate and significant, whereas for the correlations between positive coaching behavior and positive ST similar patterns were revealed. In contrast, the relationship between negative activation and athletes’ positive ST increased and became significant, specifically for the ST subscales related to psych up and instruction, whereas for athletes’ negative ST similar patterns were revealed.

The relationships between athletes’ perceptions of coaching behavior and coaches’ perception of their own behavior were moderate (\( r = .54 \) and \( r = .46 \), for supportiveness and negative activation accordingly). Nevertheless, the relationships between coaches’ perceptions of their own behavior and athletes’ ST were very similar to those of athletes’ perceptions of coaching behavior and their ST. More specifically, correlations between coaches’ negative activation and athletes’ positive
ST were nonsignificant, whereas moderate positive correlations were revealed for athletes’ negative ST. Coaches’ supportiveness had nonsignificant correlations with athletes’ positive ST, whereas moderate negative correlations emerged for athletes’ negative ST.

Overall, the results provided field—correlational evidence regarding the link between athletes’ perceptions of coaching behavior and their ST, suggesting the important role of coaching behavior and that should be further examined as an antecedent on the formulation of athletes’ ST.

The results from the first sample, where a trait approach was applied, were in accordance with the hypotheses; whereas in the second sample, where a state approach was applied, not all hypotheses were supported. Inconsistencies in the correlation patterns that emerged between the two samples could be attributed to the differences in the settings within which the data were collected. Furthermore, an unexpected positive relationship was revealed between negative coaching behavior and dimensions of positive ST in the second sample; this finding could be possibly attributed to the nature of the specific sport, but also to the highly competitive context of the occasion. Both the above issues are further discussed in the general discussion, after considering also the results of the third study. Finally, the results showed reasonable correspondence between coaches’ and athletes’ perceptions with regard to coaching behavior during match play, thus providing support for this sort of convergent validity for the instrument, and also similarity in the relationships with athletes’ ST.

Study 3

The purpose of the third study was to examine the above findings using an experimental design aiming to support the direction of causality in the relationship between coaching behavior and athletes’ ST; in other words, to support that significant others’ behavior can influence individuals’ ST in sport. Based on (a) the results of study 2 which showed positive relationships between positive coaching behavior and athletes’ ST related to confidence (in both samples) and psych up (in one of the samples), and the relationship between negative coaching behavior and athletes’ ST related to worry, and (b) the findings of Zourbanos et al. (2007) who reported a correspondence between coaches’ and athletes statements, hypotheses were formed with regard to the effects of positive and negative coaching behavior on the dimensions of positive and negative ST identified by the ASTQS. These hypotheses were also structured based on the circumstances of the experiment. In particular, it was considered that instructor’s positive behavior would involve feedback in the form of encouragement and confidence boosting, whereas instructor’s negative behavior would involve negative evaluation and criticism. Furthermore, due to the experimental nature of the study and the relatively mild physical and mental requirements of the task, it was expected that specific types of thoughts, such as thoughts related to fatigue, disengagement, anxiety control, would not be influenced by instructor’s behavior.

Overall, it was hypothesized (a) that instructor’s positive behavior in the form of praise and encouragement would have a positive effect on participants’ ST relevant to psych-up and confidence, and a negative effect on participants ST relevant to worry, (b) that instructor’s negative behavior in the form of negative evaluation and criticism would have a positive effect on participants’ ST relevant to worry,
and a negative effect on participants’ ST relevant to psych-up and confidence, (c) that instructor’s behavior (either positive or negative) would not have an effect on participants ST relevant to anxiety control, disengagement, and somatic fatigue because the setting was not expected to raise anxiety levels, participants opted to participate to the experiment, and the physical requirements of the task were relatively low (therefore scores on these dimensions were expected to be low irrespective of the treatment). Finally, no specific hypotheses were formed regarding ST relevant to instruction and irrelevant thoughts.

Method

Participants

Forty undergraduate physical education students who had enrolled in introductory tennis classes volunteered to participate in this experiment as part of their regular classes. The sample comprised of 16 males and 24 females. Their mean age was 20.08 (± 1.67) years. Participants, after performing a baseline trial were assigned into three groups: positive instructor’s approach (n = 15), negative instructor’s approach (n = 15), and a control group (n = 10).

Task and Measures

Task. The Broer-Miller Forehand Drive test (as described by Barrow, McGee, & Tritschler, 1989) was used to evaluate performance. The one half of the court was divided into zones corresponding to a point system (2, 4, 6, and 8 points), with balls landing close to the baseline counting for 8 points and balls landing close to the net counting for 2 points. Above the net, a cord was stretched at the height of 1.22 m. Participants were positioned directly behind the center mark of the baseline of the other half and executed the forehand drives with a self-drop. The score of participants was the total points gained out of 10 strokes. Following the description of the test, balls traveling over the cord were scored half their original value.

Manipulation Check. To assess perceived instructor’s behavior the measure described in Study 1 was used. Items from the CBQ were adjusted so that they refer to instructor’s behavior. For example, the item “When I need it, my coach’s tone of voice is soothing and reassuring” from the CBQ was altered to “When I needed it, my instructor’s tone of voice was smoothing and reassuring.” Cronbach’s alpha coefficients for this study ranged from .77 to .89.

Self-Talk. To assess positive and negative ST the ASTQS (Zourbanos et al., 2009) was administered (see Study 2). Participants were asked to indicate how frequently during the execution of the task experienced the thoughts that were listed on a 5-point scale (0 = never, 4 = very often). Cronbach’s alpha coefficients for ASTQS ranged from .79 to .84

Procedures

Baseline Assessment. Participants were tested twice with a three-day interval in-between. On day one, participants arrived at the court for the baseline assessment. They were informed that the test examined one’s ability to execute forehand drives,
were reassured that data would be confidential, and they were asked to sign informed consent and to complete a form containing demographic information. Subsequently they were asked to get ready to perform the test and were instructed regarding the procedures of the initial assessment. Before the initial assessment they were reminded information regarding the critical components of the forehand drive (e.g., bring racket back, turn hips and shoulders, firm wrist, eyes to the ball, swing forward). Furthermore, following Hodges and Franks’ (2002) suggestions, participants attended a visual demonstration of 10 shots on the Broer-Miller Forehand Drive test by an experienced coach. Participants performed the first set (10 trial strokes) for familiarization with the task; these strokes were not assessed. Following the familiarization phase four sets of 10 strokes were performed. Participants performed the first two sets with a 30 s interval in-between, then took a rest for 2 min and performed the third and fourth sets also with a 30 s interval in-between. All participants were tested individually. After completing the task, they were immediately asked to complete the questionnaire evaluating their ST during the test. After completing the test requirements for the initial assessment, the next assessment was scheduled, participants were thanked for their participation and were asked not to discuss with other students about the experiment. The whole procedure lasted approximately 25 min for each individual.

Experimental Assessment. The second testing took place three days after the first. During that period participants did not have the chance to practice. In relation to the baseline measurement, attempting to prevent differences in the dimensions of ST content, participants were divided into three equal performance groups. Subsequently, the three groups were randomly assigned into two experimental (positive instructor’s approach: \( n = 15 \), negative instructor’s approach: \( n = 15 \)) and one control (\( n = 10 \)) groups. To ensure that the treatments would not be compromised, each group was tested at different times, so that participants would not meet. Participants were unaware of the goals of the experiment and were not allowed to ask any questions during the experimental procedure. Furthermore two instructors were trained to use the verbal comments scripts based on participants’ performance, developed by the experimenters, to ensure the accuracy of the treatments. The scripts were written in the form of simple comments emphasizing praise, instilling confidence and enhancing motivation in the positive instructor approach (e.g., “doesn’t matter, go for the next shot” and “very good shot, keep on like this”) and criticism, negative evaluation, and blame in the negative instructor’s approach (e.g., “that’s a bad shot” and “you don’t follow my instructions”).

On the day of the experimental assessment, in an attempt to sustain the interest for the task, participants were told that they were expected to perform better than the previous time, that their performance would be recorded for the purposes of the class, and that they would have to perform the task within certain time limits. Subsequently, all groups repeated the procedures followed in the baseline testing. However, for the experimental groups, verbally expressed messages were provided by the instructors during the execution of the forehand drives. The comments were provided every two to three strokes based on the guidance about feedback frequency (Wulf, McConnel, Gartner, & Schwarz, 2002), but also in relation to participants’ performance. After completing the task for the second time all groups were again
asked to complete the questionnaires assessing their ST during the test. In addition, the two experimental groups were also asked to complete the instrument regarding the instructor’s behavior. Participants were once more requested not to discuss about the experiment with other people and were thanked for their participation. The procedure again lasted approximately 25 min for each participant. After the final completion of the experiment participants received a debriefing form explaining the purpose and the expected outcome of the experiment.

Results

Manipulation check

**Instructor’s Approach.** The manipulation check involved perceptions of participants in the two experimental groups regarding the coaching approach of the instructor. One-way MANOVA was calculated, with group as the independent factor and the two CBQ dimensions (supportiveness and negative activation) as dependent measures. The analysis revealed a significant multivariate effect, $F(2, 27) = 5.74, p < .01, \eta^2 = .30$. Examination of the univariate effects revealed that the effect was significant for both CBQ dimensions; for supportiveness, $F(1, 29) = 11.51, p < .01, \eta^2 = .29$; for negative activation, $F(1, 29) = 5.71, p < .05, \eta^2 = .17$. Inspection of the means showed that participants in the positive approach group had higher scores on the supportiveness and lower scores on the negative activation than participants in the negative approach group.

Baseline Differences

A one-way ANOVA was calculated to test for differences in performance between the two experimental and the control groups at baseline. The analysis revealed that there were no significant performance differences between the three groups, $F(2, 39) = .31, p = .73$. A one-way MANOVA was calculated to test for differences in ST dimensions between the two experimental and the control groups at baseline. The analysis revealed that there were no significant differences in ST between the three groups, $F(16, 62) = 1.27, p = .25$.

Preliminary Analysis

Before proceeding to examining the effects of the instructor’s approach to the ST dimensions, the relationships between performance and ST were examined, because performance can affect the thoughts individuals experience (Van Raalte et al., 2000). Correlation analysis was calculated between changes in performance (from baseline to experimental sessions) and positive and negative thoughts individuals reported for the experimental session. The analysis revealed low to moderate, but nonsignificant, positive relationships between performance and positive thoughts ($r$ ranging from .10 to .28) and negative low relationships between performance and negative thoughts ($r$ ranging from −.06 to −.14). Nevertheless, in examining the effect of instructor’s approach to participants’ ST, performance was included as a covariate because the magnitude for some of the correlations was not negligible.
Main Analysis

A two-way (group $\times$ trial) mixed model MANCOVA was calculated to test for differences in the pattern of positive and negative thoughts between the three groups. The analysis revealed a significant group by trial interaction, $F(16, 60) = 1.93$, $p < .05$, $\eta^2 = .34$. Examination of the univariate effects revealed that the effect was significant for confidence, $F(2, 36) = 3.29$, $p < .05$, $\eta^2 = .16$; psych-up, $F(2, 36) = 5.67$, $p < .01$, $\eta^2 = .24$; instruction, $F(2, 36) = 5.07$, $p < .05$, $\eta^2 = .22$; and worry, $F(2, 36) = 3.28$, $p < .05$, $\eta^2 = .15$. Examination of the pairwise comparisons and the means showed that (a) for the positive approach group scores on worry decreased ($\eta^2 = .40$, $p < .01$) in the experimental condition, and (b) for the negative approach group scores on confidence ($\eta^2 = .61$, $p < .01$), psych-up ($\eta^2 = .45$, $p < .01$) and instruction ($\eta^2 = .48$, $p < .01$) decreased in the experimental condition. No changes were observed for the control group. The mean scores for the three groups appear in Table 3. Overall, the results only partially supported the first and the second hypotheses as instructor’s positive behavior only influenced participants' worry, and instructor’s negative behavior only influenced participants’ positive ST dimensions. The third hypothesis was supported by the lack of impact on participants’ ST related to fatigue, disengagement and anxiety control. Finally, regarding the ST dimensions for which no hypotheses were formed, it was revealed that instructor’s negative behavior had a negative impact on ST related to instruction, whereas no impact was identified for irrelevant thoughts.

General Discussion

The purpose of the study was threefold. First, to validate Williams et al.’s (2003) questionnaire of coaching behavior in the Greek language, second to examine in field the relationships between coaches’ behavior and athletes’ ST dimensions, and third to empirically support the causal direction of the relationships between coaching behavior and athletes’ ST. Overall, the results provided support for the psychometric integrity of the CBQ in the Greek language, and showed through correlational and the experimental evidence that athletes’ ST is related and can be influenced by coaches’ behavior.

Construct Validity of CBQ

Williams et al. (2003) in their attempt to create a measure of coaching behavior identified two broad behaviors namely negative activation (negative behavior) and supportiveness/emotional composure (positive behavior). Zourbanos et al. (2006, 2007) used the specific measure in two Greek samples providing preliminary evidence of the psychometric properties of the scale. In this study, following minor wording revisions that emerged on the basis of the previous evaluations, confirmatory factor analysis provided evidence that the CBQ is best represented by a model with two distinct dimensions of behaviors as suggested by Williams et al. (2003). Moreover, the results from reliability analysis from the three studies included in the present investigation, provided evidence for the internal consistency of the scale. Overall, the results provided supportive evidence for the integrity of the instrument, and we are confident in the use of the instrument for examining coaches’ behavior.
Table 3  Means and Standard Deviations of ST Under the Different Conditions

<table>
<thead>
<tr>
<th>ASTQS</th>
<th>Positive Approach</th>
<th>Negative Approach</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>Experimental</td>
<td>Baseline</td>
</tr>
<tr>
<td>M ± SD</td>
<td>M ± SD</td>
<td>M ± SD</td>
<td>M ± SD</td>
</tr>
<tr>
<td>Psych Up</td>
<td>1.81 ± .95</td>
<td>2.13 ± 1.20</td>
<td>2.29 ± .92</td>
</tr>
<tr>
<td>Confidence</td>
<td>2.42 ± 1.01</td>
<td>2.29 ± 1.07</td>
<td>2.51 ± .69</td>
</tr>
<tr>
<td>Instruction</td>
<td>2.75 ± .60</td>
<td>2.68 ± .82</td>
<td>2.95 ± .58</td>
</tr>
<tr>
<td>Anxiety Control</td>
<td>1.72 ± 1.01</td>
<td>1.73 ± .90</td>
<td>2.39 ± .83</td>
</tr>
<tr>
<td>Somatic Fatigue</td>
<td>.73 ± .69</td>
<td>.31 ± .67</td>
<td>.53 ± .45</td>
</tr>
<tr>
<td>Disengagement</td>
<td>.20 ± .48</td>
<td>.13 ± .32</td>
<td>.19 ± .41</td>
</tr>
<tr>
<td>Worry</td>
<td>.97 ± .74</td>
<td>.44 ± .46</td>
<td>.78 ± .72</td>
</tr>
<tr>
<td>Irrelevant Thoughts</td>
<td>.28 ± .36</td>
<td>.37 ± .51</td>
<td>.32 ± .64</td>
</tr>
</tbody>
</table>
in the Greek language. The measure may be useful in helping researchers and sport psychologists to identify coaches’ behavior during training or competition.

Coaching Behavior and Athletes’ ST

Results from the two samples employed in the field studies were not identical, and some of the relationships were not in the expected direction. For sample 1, where a trait approach was adopted, the identified trend showed larger magnitude of correlations for corresponding in terms of valence subscales: positive coaching behavior had larger correlations with positive ST dimensions (compared with negative ST dimensions) and negative coaching behavior has larger correlations with negative ST dimensions (compared with positive ST dimensions). Thus supporting that in general, positive and negative coaching behavior is respectively linked to positive and negative ST. The results from the first sample are similar to the results identified in the preliminary studies by Zourbanos et al. (2006, 2007) where a trait approach was also used. For Sample 2, where a state approach was adopted, a somewhat different trend was identified with larger correlations for the relationships between coaching behavior and athletes’ negative ST (negative relationship for positive coaching behavior and positive relationship for negative coaching behavior), suggesting that negative ST is more vulnerable to the influence of significant others. In addition, a positive relationship was revealed between negative coaching behavior and positive ST. Given the equivocal results of the two samples, it should be noted that to our knowledge this was the first study to investigate the relationship between coaching behavior and athletes’ ST in a competitive setting. Interestingly, Smoll and Smith (1989) provide a likely argument for the interpretation of the unexpected positive relationship between coaches’ negative behavior and athletes’ positive ST; they postulated that in some cases, especially in aggressive sports like wrestling, when coaches’ negative behavior is expected to a degree, it can be tolerated, and athletes may respond less negatively than athletes in other sports, which are characterized as less aggressive. Thus, in the second sample, taking into consideration the nature of the sport and the competitive level of the athletes, but also the fact that data were selected in a more competitive context and coaching emphasis on winning was more prevalent, it is possible that coaches’ negative behavior may have operated motivationally, in the form of thoughts related to psych-up and instruction. This kind of negative and punitive behavior was, and still is, quite common in “old school” coaches. Considering that athletes may get used to such behavior and eventually learn to tolerate it, or even use it to their benefit, it is not surprising that many of these coaches have excelled in competitive sports. However, it should be noticed that in youth sport, coaches should not forget that their role is not only to win but to promote personal development and fun (e.g., Smoll & Smith, 1989; Smoll & Smith, 2006). Furthermore, considering that game circumstances have been found a significant predictor of athletes’ ST (Van Raalte et al., 2000), the fact that these relationships remained relatively stable even after controlling for match outcome, further supports the importance of coaching behavior in shaping athletes’ ST.

For the second sample from Study 2, coaches were also asked to rate their behavior in relation to each athlete during the match play. The results showed moderate relationships between athletes’ and coaches’ perception regarding coaching behavior. Mean scores showed that coaches and athletes scored similarly on the two
coaching dimensions, suggesting that coaches did not seem to have a self-serving bias, and providing adequate support for the integrity of the instrument. Furthermore, the relationships that emerged between coaches’ perceptions of their own behavior and athletes’ ST were very similar to those that emerged from athletes’ perceptions of coaching behavior and their own ST.

In the third study, an experimental design was implemented to identify causal relationships. The use of the CBQ as a manipulation check supported the effectiveness of the intervention for the two experimental conditions, but also provided experimental evidence regarding the validity of the CBQ in identifying distinct coaching behaviors. Overall, the results of this experimental study showed only reverse effects for the impact of coaching behavior on ST, with positive coaching behavior negatively affecting negative ST and negative coaching behavior negatively affecting positive ST. The relative discrepancy between Studies 2 and 3 with regard to the different ST dimensions related to the different coaching behaviors may reside to the characteristics of the studies; that is the design and the sample. First, in Study 2, a field approach was used whereas in Study 3 an experimental approach was used. Second, in study 2, correlational data were obtained, whereas in Study 3 causal relationships were tested. Finally, in Study 2, participants were competitive athletes assessed in training and competition setting, whereas in Study 3 participants were students tested in a novel task. Although, the results of the two studies were not identical, the findings support with consistency that significant others’ behavior is related to, and in fact can influence, the content of ST. Finally, the results revealed that positive and negative coaching behavior had different effects on the different ST dimensions, which further strengthens the multidimensional approach to the content and structure of ST (Zourbanos et al., 2009).

Limitations and Future Research

The present findings have highlighted the significant role of coaches’ behavior on athletes’ ST; nevertheless, a number of limitations that further research should address are considered below. First, certain sampling issues should be considered. The samples in Studies 2 and 3 were heterogeneous, as competitive athletes participated in the field study, whereas students participated in the experimental study. The sporting sample aimed to provide evidence regarding the relationships between perceived coaching behavior and ST in naturalistic settings, whereas experimental evidence were sought to support that causality can be supported in the identified relationships. Even though access to sporting samples for experimental purposes, and in particular with regard to positive and negative coaching behaviors is hard to get and may raise ethical barriers, further experimental research with athletes will more emphatically support the impact of the coach on athletes’ ST. In addition, research across other sports and especially team sports is needed to determine the degree to which coaches’ behavior can have an impact on athletes’ ST. Nevertheless, we chose to limit the studies to individual sports to avoid the threat of sport confound particularly in relation to coaches’ behavior which has found to play an important role (Smoll & Smith, 1989). Furthermore, designs with larger experimental groups will help further clarifying the impact of coaching behaviors on the different ST dimensions. Nevertheless, considering that no previous research has examined this kind of relationships in field and experimentally, the present findings provide valuable evidence regarding the impact of coaching behavior on athletes’ ST.
Second, the issue of retrospective self-reports that were used should be addressed. With regard to the assessment of ST, verbal reports are associated with cognitive processes that sometimes may be beyond metacognitive control and thus cannot be described by the individuals, may be forgotten, or recalled inaccurately (Nisbett & Wilson, 1977). However, cognitive processes cannot be accurately assessed through external measures and the use of self-reports provide us with “metacognitive knowledge,” which can help us understand perceptions, motives, and generally what someone is thinking (Guerrero, 2005). Attempting to overcome these barriers in Study 2, ST was assessed using a trait but also a state approach. With regard to coaching behaviors, the use of athletes’ perceptions does not necessarily reflect actual coaching behavior and can be influenced by several personal and situational factors. In addition, coaches’ perceptions regarding their own behaviors were assessed in Study 2 to test the correspondence between athletes and coaches. Although CBQ-C was based on the established CBQ and showed good internal consistency, further validation is required to establish its psychometric properties. Future research should focus on the use of different methodological approaches, combining observational tools such as CBAS (Smith et al., 1978) to assess coaching behaviors, and the Self-Talk and Gestures Rating Scale (Van Raalte, Brewer, Rivera, & Petitpas, 1994) to assess athletes’ ST, along with the use of the CBQ and the ASTQS would provide additional data and more comprehensive findings. Furthermore, future investigations should be encouraged to formulate more specific hypotheses regarding the multidimensionality of ST providing more detailed information for consultants and coaches. Finally, future research addressing discriminant and concurrent validity would further support the psychometric integrity of the CBQ in the Greek language.

In summary, the present findings suggest that coaching behavior may impact athletes’ ST but also may have different effects on different ST dimensions. Taking into account the significant role of thoughts on performance, this line of research may contribute to subsequent explorations into the antecedents and consequences of athletes’ ST. Hardy (2006) defined ST as “verbalizations or statements addressed to the self, multidimensional in nature, having interpretive elements association with the content of statements employed, is somewhat dynamic and serving at least two functions; instructional and motivational for the athlete” (p. 84). Taking into consideration the social influences on ST and based on the empirical support of the current study and the previous findings (Zourbanos et al., 2006, 2007), we could add to the definition another element, besides the above characteristics proposed by Hardy (2006), that ST has shown to be “malleable to perceptions and interpretations of stimuli from the social environment.”

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References


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