ResearchGate

See discussions, stats, and author profiles for this publication at: https://www.researchgate.net/publication/222277408

# Speaking clearly: A critical review of the self-talk literature

**Article** *in* Psychology of Sport and Exercise · January 2006

DOI: 10.1016/j.psychsport.2005.04.002

CITATIONS
259

READS
11,309

**1 author:**

James Hardy
Bangor University

**54** PUBLICATIONS **2,379** CITATIONS

SEE PROFILE

**Some of the authors of this publication are also working on these related projects:**

Project Goal-directed and spontanoeus self-talk and mind wandering in sports View project

Project North Wales Rugby Research Project (NW2RP). View project

All content following this page was uploaded by James Hardy on 09 January 2019.

The user has requested enhancement of the downloaded file.

ELSEVIER

Psychology of Sport and Exercise 7 (2006) 81–97

Psychology
OF SPORT AND EXERCISE

www.elsevier.com/locate/psychsport

# Speaking clearly: A critical review of the self-talk literature

James Hardy*

*School of Sport, Health and Exercise Sciences, University of Wales, Bangor, George Building, Normal Site, Bangor, Gwynedd LL57 2PZ, UK*

Received 20 January 2004; received in revised form 9 November 2004; accepted 17 April 2005
Available online 1 July 2005

**Abstract**

The present review of the self-talk literature attempts to stimulate research in this under-investigated area. A critique of how the construct has been defined is offered. A working definition of self-talk is then presented. The nature of self-talk is then focused upon. Six aspects are covered: (a) self-talk's valence (i.e. positive–negative self-talk); (b) overtness (i.e. covert–overt self-talk); (c) frequency; (d) how self-determined the self-talk is; (e) (directional and intensity) motivational interpretations of self-talk; and (f) the functions that self-talk can serve for the athlete. Finally, applicable theories to the study of self-talk are forwarded in order to provide interested researchers with theory-based future directions for research.
© 2005 Elsevier Ltd. All rights reserved.

*Keywords:* Self-talk; Literature review; Definitions; Nature; Theories

From an applied perspective, the mental skill of self-talk is frequently included as an integral component of psychological interventions (e.g. Hanton & Jones, 1999). The common use of self-talk in combination with other mental skills (i.e. the use of mental skills packages) does not, however, permit an understanding of how each of the respective aspects function in a stand-alone fashion. This lack of understanding is compounded by the, until recently, relative lack of systematic research conducted on self-talk. This is unfortunate given that individual's thoughts and self-talk are critical to both cognitive processes (Bunker, Williams, & Zinsser, 1993) and emotions (Lazarus, 1982). Inevitably problems exist within the literature. For example, researchers have employed definitions of self-talk that do not caption the full extent of the construct. The clarity of how concepts are defined has import for research and theory building. Additionally, given the importance of theory within the behavioral sciences (Kerlinger, 1986), and the fact that theories with relevance to the study of self-talk have been advanced for some

* Tel.: +44 1248 383493; fax: +44 1248 371053.
*E-mail address:* j.t.hardy@bangor.ac.uk.

1469-0292/$ - see front matter © 2005 Elsevier Ltd. All rights reserved.
doi:10.1016/j.psychsport.2005.04.002

time (e.g. Landin, 1994); the lack of theory-based research is disconcerting (Hardy, Gammage, & Hall, 2001).

The overall aim of the literature review was to stimulate further interest and ultimately research on self-talk in both the sport and exercise domains. Given the limited development of the field, it was deemed prudent to offer an explicit comprehensive definition of self-talk as well as suitable future directions for researchers to pursue. To this end, three fundamental aspects pertinent to self-talk are covered: (a) definitions of self-talk; (b) the nature of self-talk; and (c) applicable theories to self-talk, with an emphasis on theories that have thus far not been offered as pertinent to the field.

## Self-talk defined

One of the cornerstones of the social sciences is the manner in which constructs are defined. Constitutive definitions in turn have serious implications for how the respective constructs are measured (Carron, Brawley, & Widmeyer, 1998); that is, how variables are operationally defined. As such, if one were interested in the nature of a variable it would be problematic, in conceptual terms, to measure the antecedents or consequences of the variable and not the variable itself. The relevance of this principle is especially apt to the topic of self-talk, and is highlighted in the proceeding section. Another definition-related concern is the use of imprecise definitions. The impact of using imprecise definitions has been seen in the imagery literature. Here, imprecise definitions of the 'internal imagery' lead to the confounding of the internal visual imagery perspective with kinesthetic imagery (see White & Hardy, 1995). As a result, key aspects of previously employed definitions of self-talk will also be highlighted.

### *Global definitions*

As with other underdeveloped areas within sport psychology, numerous definitions with varying emphases have been forwarded in the self-talk literature. These definitions range from the more infrequently proposed combining of cognitive and behavioral aspects to the more common, purely cognitive based. Theodorakis, Chroni, Laparidis, Bebestos, and Douma (2001, p. 310) illustrate an example of the former—"self-talk can be manifested in verbal or non-verbal ways, in the form of a word, a thought, a smile, a frown, etc. (Chroni, 1997)". This quote seemingly illustrates the importance of thorough and accurate constitutional definitions as the definition has apparently confounded the nature of self-talk with some of its consequences and/or associations (i.e. the non-verbal manifestations).

An example of an exclusively cognitive and frequently cited definition of self-talk originates from Bunker et al. (1993). They viewed self-talk as "anytime you think about something, you are in a sense talking to yourself" (p. 226). As a result, Bunker et al. also saw self-talk as the key to cognitive control. As Hardy, Jones, and Gould (1996) noted, this definition is rather vague and places an emphasis on thoughts in general, which makes the specific measurement of self-talk difficult. One reason for this is that such eclectic thought-oriented definitions include amongst other things, day dreams, mental imagery, and self-statements (Hardy, Gammage et al., 2001). Although, arguably, such cognitions occur together, using Bunker et al.'s definitional stance self-statements may be confounded with other phenomenon such as, mental imagery. As such, an emphasis on self-statements alone would give a (much) more specific focus for self-talk researchers to begin to better understand the construct.

*Self-statement oriented definitions*

Theodorakis, Weinberg, Natsis, Douma, and Kazakas (2000) defined self-talk as "what people say to themselves either out loud or as a small voice inside their head" (p. 254). Theodorakis et al.'s definition highlights two important aspects of self-talk. First, self-talk can be said either overtly or covertly. Second, self-talk is comprised of statements that are addressed to oneself and not to others. This latter aspect is worthy of extension. Diaz (1992) noted that private speech (or overt self-talk) contrasts from social speech as private speech is typically defined "…as addressed to the self (not to others) for the purpose of self-regulation (rather than communication). As such, any study of private speech [and self-talk] involves a fundamental judgment regarding the social versus private intent of the speaker…" (p. 62). The distinction between social versus private intent is not always, however, unambiguous. For example, such judgments cannot be based solely on the speaker's expectation of a verbal response. Human communication takes on many and sometimes subtle forms, such as a nod of the head or a raise on an eyebrow.

Although Theodorakis et al.'s (2000) definition of self-talk is certainly self-statement oriented, and thus an improvement on thought-oriented conceptualizations, it is probably a little simplistic, failing to identify the potential uses of self-talk. An alternative definition was offered by Hackfort and Schwenkmezger (1993). They proposed that self-talk was a "dialogue [through which] the individual interprets feelings and perceptions, regulates and changes evaluations and convictions, and gives him/herself instructions and reinforcement" (p. 355). This definition not only provides a self-statement orientation, but also alludes to some of the uses of self-talk. One point raised by the definition is nonetheless worthy of discussion.

The term, talk, implies a conversation between at least two people; one speaking and one listening. The emphasis of the presence of two persons or two systems is not absent from Hackfort and Schwenkmezger's (1993) definition of self-talk, which explicitly includes the term dialogue within it. This implies that two systems pertain to self-talk, a generative component and an auditory or perceptual component. This is not an unusual conceptualization of self-talk. According to MacKay (1992), evidence supports the proposal that the generative component of self-talk is not exclusively articulatory in nature. That is, it is neither exclusively comprised of muscles responsible for the speech function of the lips and tongue, nor the deeper organs involved in speech, such as the lungs. In addition to the articulatory aspect of the generative system are the more theoretical and abstract, phonological units of self-talk, responsible for sound and language. From a hierarchically perspective, the phonological units are superior to the articulatory aspects. As such, it is possible that the phonological units govern the articulatory units involved in the generation of self-talk.

With regard to the perceptual component of self-talk, this system is particularly relevant to inner speech or covert self-talk. This is because the perceptual system is akin to an 'inner ear' able to detect statements made using a small voice in one's head. However, it has been argued that the two systems; generative and perceptual, are in actuality inseparable (MacKay, 1992). For example, it could be argued that if an athlete has generated self-talk then there is no need for that athlete to employ a perceptual system in order to detect their self-statements, as it was that athlete who had originally generated the self-talk. Therefore, they would already know what they said to themselves.

A fundamental implication that can be gleaned from the above discussion of what should and should not be designated as self-talk is that it may be more correct to refer to the phenomenon as self-statements

or verbalizations as opposed to self-talk. However, in order to aid the reader's comprehension by keeping in line with previous literature, the term self-talk is utilized in the proceeding sections.

### *A working definition of self-talk*

It is comparatively easier to 'knock down' previously employed definitions of self-talk than to 'build' an improved working definition. Researchers should, however, strive to expand upon respective knowledge bases in order to increase our understanding of particular areas—self-talk is one such example. Thus, it is suggested that researchers would do well to describe self-talk along the following guidelines. Self-talk should be defined as: (a) verbalizations or statements addressed to the self; (b) multidimensional in nature; (c) having interpretive elements association with the content of statements employed; (d) is somewhat dynamic; and (e) serving at least two functions; instructional and motivational, for the athlete. It should be noted, however, that as our knowledge of socially constructed variables, such as self-talk, changes over time, it is extremely likely that the above guidelines (concerned with how to define the variable) will also need modification. A supportive argument for the first aspect of self-talk has already been presented. Support for each of the other aforementioned aspects will be presented in Section 2.

## Nature of self-talk

A second fundamental aspect to forming a clear understanding of the potential applied implications of self-talk interventions is to comprehend the nature of self-talk. To this end, two decades ago, Van Noorde (1984) noted that there are numerous dimensions association with self-talk (in general), and more specifically in the sporting domain. It is perhaps because of self-talk's diversity that it has received little concerted attention from researchers (see Van Raalte, Brewer, Rivera, & Petitpas, 1994; Van Raalte et al., 1995; Van Raalte, Cornelius, Brewer, & Hatton, 2000; work for an exception). As a result, the current section of this review forwards six aspects to the nature of self-talk in order to offer some clarity about what exactly self-talk is. It should be noted that although each of the aspects are present separately, substantial overlap between aspects exists.

### *Valence dimension*

The first aspect of self-talk, its valence, is concerned with the content of self-talk and is anchored with the bi-polar descriptors of positive and negative self-talk. This dimension of self-talk has received much more research emphasis than any other aspect of self-talk, although it has yet to be demonstrated that it is the most important dimension. On the one hand, self-talk that is said as a form of praise (Moran, 1996), and helps keep the athlete's focus of attention in the present, not on past errors or the distant future is commonly termed positive self-talk (Weinberg, 1988). On the other hand, self-talk that is said as a form of criticism (Moran, 1996), and "… that gets in the way because it is inappropriate, irrational, counterproductive, or anxiety-producing is called negative self-talk" (Theodorakis et al., 2000, p. 254). It is evident that these definitions imply two different aspects. Moran's (1996) view places an emphasis on encouragement, a process-related variable as well as the content of self-talk. The alternative perspective, however, implies performance, an outcome-related variable; specifically, positive self-talk

assisting and negative self-talk hindering performance. The alternative perspective is thus broader in its focus, allowing for the inclusion of statements of encouragement as well as instruction, which may enhance performance but not motivation directly. Consequently, it may be better to refer to the alternative broad approach to defining positive and negative self-talk as facilitative and debilitative self-talk (Peters & Williams, 2003). While the emphasis on performance may not be the most appropriate way in which to view positive and negative self-talk, previous research has predominately focused on the effects of positive versus negative self-talk on performance levels.

Research that has examined the effect of positive and negative self-talk has produced varied and equivocal support for the use of positive self-talk. Stronger support for the use of positive self-talk to aid performance has been generated from laboratory based studies, as opposed to field based studies (Hardy et al., 1996). For example, a survey-based study by Highlen and Bennett (1983: Study 1) offered some evidence contrary to the strongly held belief that positive self-talk leads to performance improvements. Elite divers' use of positive self-talk helped discriminate between qualifiers and non-qualifiers for the Canadian Pan Am diving team; non-qualifiers used more positive self-talk than qualifiers. It should be noted, however, that this finding was based on a small sample and was not replicated with a sample of elite wrestlers (Study 2). Conversely, Van Raalte et al.'s (1995) experimental study replicated Dagrou, Gauvin, and Halliwell's (1992) finding that a positive self-talk group significantly outperformed a negative self-talk and control group on a dart-throwing task.

Within the sport literature, an alternative approach to the use of survey and experimental-based studies in order to examine the effects of positive and negative self-talk on performance has been to utilize direct observation. Van Raalte et al. (1994) assessed youth tennis players' use of audible or overt self-talk during competitive matches via the Self-Talk and Gestures Rating Scale (STAGRS). Although it was found that match winners used less negative self-talk than match losers, winners and losers did not differ on the use of positive self-talk. The lack of a significant positive self-talk–performance relationship may be accounted for by Van Raalte et al.'s suggestion that positive self-talk is more likely to be internalized than negative self-talk and as such, was not audible and thus not measured. Further analysis of the tennis data suggested that differences in the use of self-talk between winners and losers were not due to the manner in which they generated self-talk, but rather the manner in which they responded to it.

The STAGRS was employed in a subsequent investigation with an adult tennis player sample which examined the antecedents and consequences of self-talk (Van Raalte et al., 2000). With regard to the antecedents of self-talk, it was found that losing a point and receiving serve contributed to an increase in the use of positive self-talk, whereas losing a point and serving contributed to an increase in the use of negative self-talk. It was proposed that athletes utilized negative self-talk as a strategy to help express their dissatisfaction with poor performance. With regard to the prediction of performance following self-talk, it was found that for the large majority (15 out of 18) of tennis players positive self-talk was not related to the outcome of the following point. Similarly, point outcome could not be predicted by the use of negative self-talk for any of the tennis players sampled. This is somewhat suggestive that there is a significant performance–self-talk association but a non-significant self-talk–performance relationship. It is clear that closer inspection of the direction of the self-talk valence–performance relationship is warranted.

### *Overtness dimension*

The second aspect of self-talk, its overtness has to some extent already been touched upon. This dimension of self-talk is concerned with how an athlete's self-statements are verbalized. At one extreme

of the bi-polar continuum, athletes may talk to themselves in a very overt fashion, similar to the type of self-talk investigated by Van Raalte et al. (1994, 2000) with their observational technique. Overt, private speech or external self-talk as it is also referred to, is said in a manner that allows another individual to hear what was said. Covert, inner speech or internal self-talk is situated at the other extreme of the continuum. Covert self-talk is said using a small voice inside one's head, and so cannot be heard by another individual. To date there has not been a direct comparison between the effectiveness of overt and covert self-talk in the sport domain. A mainstream psychology finding, however, reported by Hayes et al. (1985) suggests that coping self-statements in a laboratory setting were only effective when they were publicly known (i.e. overt). Hayes and colleagues proposed that this was because publicly known self-statements worked via the setting of social standards as opposed to self-standards. Thus, an overt coping self-statement "could have established a socially available standard against which their performance could be evaluated" (p. 202). Findings from the sport goal setting literature echo this result. A meta-analysis conducted by Kyllo and Landers' (1995) on goal setting in sport and exercise found that public goals (ES = 0.79) were found to have a significantly larger effect size than semi-private (ES = 0.20) and private (ES = 0.06) goals.

Based on the assumption that self-talk is comprised of both covert and overt forms of self-statements overlap between these two aspects exist. For example, the learning of sentences occurs at the same rate and in a similar pattern regardless of whether the self-talk is said overtly or covertly (MacKay, 1992). There are, however, some interesting and peculiar differences between these two forms of self-talk. From an articulatory standpoint, there are numerous examples of divergence. For example, acoustic aspects to overt self-talk are seemingly absent from covert self-talk (MacKay, 1992). As such, MacKay (1992) suggested that an individual employing overt self-talk is able to alter the pitch and volume of their statements, however, this is not the case for covert self-talk. Similarly, an individual using overt self-talk is able to successfully impersonate another whereas this is not case for an individual employing covert self-talk. A final illustration of the differences between overt and covert self-talk is the effect of 'tongue twisters'. An individual saying the common British tongue twister, 'Red lorry, yellow lorry' repeated and with enough speed will eventually produce the expected tongue twister effect. If, however, the individual says the same phrase covertly, the tongue twisting effects are not as easily induced. It has been proposed that such findings are indicative of structural composition differences for the respective forms of self-talk. Specifically, that overt self-talk has a much larger articulatory component as compared to covert self-talk, which is principally phonological in nature (MacKay, 1992).

Returning to the sport self-talk literature; much of the research has not drawn the distinction between overt and covert self-talk (e.g. Hardy, Hall, & Alexander, 2001). The limited number of studies that have drawn a distinction have tended to examine overt (e.g. Van Raalte et al., 1994, 2000) and covert (e.g. Hardy, Hall, Gibbs, & Greenslade, in press-b) self-talk separately. As a result, the issue of which type of self-talk is most effective with regard to athletic performance has not, as yet, been investigated. From an applied perspective, closer examination of the overtness dimension would allow for a better understanding of the use and effects of overt and covert self-talk, which would in turn assist practitioners to devise effective self-talk interventions. Such an approach would be in line with Carron's (1993) promotion of theory and research informed practice.

### *Self-determined dimension*

The third aspect of self-talk is concerned with how self-determined the statements used by an athlete are. This should not be confused with the term how self-generated self-talk is. If an athlete's

verbalizations are self-talk, they are also self-generated. As such, the self-determined dimension of self-talk can be conceptualized with 'assigned' and 'freely chosen' representing anchors of the continuum. The former signifies self-statements generated with absolutely no self-determined control over them, whereas the latter represents self-talk that is completely determined by the athlete, and as a result, occurs in a natural manner. It may be possible that with practice an athlete's perception of assigned self-talk changes to a perception that their self-talk is now at the opposite end of the self-determined continuum. Assigned self-talk has been most frequently employed in laboratory studies (e.g. Dagrou et al., 1992; Theodorakis et al., 2000; Van Raalte et al., 1995) in order to allow the experimenter control over the content of self-statements utilized by the subjects. There has been at least one case, however, when self-selected self-talk treatment groups were employed in an experimental study design. Harvey, Van Raalte, and Brewer (2002) randomly assigned 80 golfers to three treatment groups and one control group. Group members were given a list of self-statements corresponding to their respective instructional, positive, and negative self-talk treatments, in order to give some choice regarding which statements they could utilize. The pitching performance of the instructional self-talk group was significantly more consistent than the negative self-talk and control groups. No group differences emerged for shot accuracy. It is possible, however, that improved accuracy might have been detected with a more sensitive single-subject design (Greenspan & Feltz, 1989).

Alternatively, it is feasible that athletes can employ assigned self-talk in naturalistic settings; for example, performance enhancement in specific tennis (Landin & Hebert, 1999) and basketball (Perkos, Theodorakis, & Chroni, 2002) skills has been associated with self-talk interventions conducted by sport psychology practitioners. It is more likely, however, that in naturalistic settings athletes would most frequently utilize self-talk determined by the self. For example, Rushall, Hall, Roux, Sasseville, and Rushall (1988) allowed elite cross-country skiers to develop their own task-relevant, mood and positive self-talk statements; performance improvements in excess of 3% were associated with the use of such statements.

Although there has not been a direct comparison as to whether assigned or freely determined self-talk is most effective, it can be inferred from Deci and Ryan's (1985) Cognitive Evaluation Theory that self-talk, freely determined by the athlete might have the greatest motivational influence. This theory proposes that humans have an inherent drive to feel personally competent and self-determinant and that individuals' feeling of self-determination for their actions is related to their perceptions of choice. Thus, self-talk chosen by athletes should have positive effects on their levels of intrinsic motivation. This is an important point when one considers that athletes report issues surrounding their ability to adhere to mental skills interventions (Bull, 1991) and Theodorakis et al. (2000) suggested that athletes may need time and practice to completely learn how to most effectively use verbal cues. When considered in concert with Palmer's (1992) suggestion that coaches should have an active role in the generation of task dependent verbal cues (due to their greater level of expertise), application of Cognitive Evaluation Theory would dictate that the development of the most effective verbal cues should include the collaboration of the coach, sport psychology practitioner, plus the athlete.

### *Motivational interpretation dimension*

Drawing from the competitive anxiety literature which has examined the intensity, directional interpretation and frequency of anxiety related symptoms (e.g. Jones, Swain, & Hardy, 1993), the motivational interpretation dimension has links with the directional interpretation aspect of anxiety. As such, it is concerned with the evaluation of whether individuals view their self-talk as de-motivating

or motivating for themselves (Hardy, Hall et al., 2001). High school athletes have reported interpreting their self-talk to be significantly more motivating for themselves immediately prior to competition than immediately prior to practice (Hardy, Hall et al., 2001). The same study found the directional interpretation dimension to be positive and moderately related to self-talk's valence dimension although some athletes were found to interpret their negative self-talk to be motivating for themselves. Goodhart's (1986) explanation for her negative self-statement group's performance improvement, as being predominantly motivational and Van Raalte et al.'s (1995) negative self-talk group's higher future expectations findings, offer limited support for this latter finding. Furthermore, a positive weak bivariate correlation between directional interpretation of self-talk and self-efficacy to perform an endurance-based sit-up task has been found (Hardy et al., in press-a).

Although further examination of athletes' motivational interpretation of the content of their self-talk would almost certainly assist our limited understanding of how self-talk relates to motivation, to date, there is limited published research focusing on this issue.

### *Functions of self-talk*

Another aspect of self-talk that is connected to motivation revolves around the functions that self-talk might serve the athlete or, the reasons why an athlete might employ self-talk. The possible function of self-talk was one of the foci of a qualitative study by Hardy, Gammage et al. (2001). Athletes reported using self-talk for two main instructional and motivational reasons or functions. Theodorakis et al. (2000) and Hatzigeorgiadis, Theodorakis, and Zourbanos (2004) offer some additional support for this broad classification of self-talk. Both projects found that the performance of relatively fine motor tasks requiring skill, timing, and accuracy was enhanced to a greater extent by instructional self-talk, focusing on the technical aspects of performance, than motivational self-talk. Some support for the use of motivational over instructional self-talk with gross motor skills has also been generated by Hatzigeorgiadis et al. These two broad functions can, however, be further refined into two more specific instructional functions—skills and strategy related, and three more specific motivational functions—arousal, mastery, and drive (Hardy, Gammage et al., 2001). The motivational arousal function refers to the use of self-talk to assist in psyching up, relaxation, and the control of arousal levels. The motivational mastery function is related to mental toughness, focus, confidence, and mental preparation—all required to successfully master challenging circumstances. The motivational drive function is somewhat more nebulous in nature than the other two motivational functions. It is concerned with assisting the athlete keep on course to achieve their goals. Consequently, this function is associated with maintaining or increasing drive and effort levels.

Preliminary findings regarding athletes' use of the functions of self-talk suggest that performers utilize each of the functions reasonably frequently and that an increased employment of virtually all functions is present in conjunction with competition as compared to the practice setting (Hardy, Hall, & Hardy, in press-b). It was suggested that this might be due to athletes utilizing self-talk to offer additional guidance and motivation when their cognitive resources are reduced in association with the competitive setting.

### *Frequency dimension*

The final aspect of self-talk, its frequency has overlap to each of the aforementioned aspects of self-talk. The frequency of self-talk is concerned with how often the individual employs self-talk, anchored by the terms 'never/not at all' and 'always/all the time'. Previous research has found that successful

athletes may use more self-talk than unsuccessful athletes. Specifically, Mahoney and Avener (1977) found that male gymnasts that qualified for the US Olympic team reported a greater use of self-talk in competition and practice than those gymnasts that did not qualify for the Olympics. The frequency with which athletes employ self-talk has also been found to increase across phases of the season (i.e. off-season to early competitive-season to late competitive-season) (Hardy, Hall, & Hardy, 2004), and temporal phase of practice/competition (i.e. before to during to after) (Hardy et al., in press-b). Taken together the above findings suggest that there is a dynamic aspect to self-talk.

As in other areas of sport psychology (e.g. athletes' reported imagery use), previous self-talk research has more commonly combined the frequency dimension with other self-talk dimensions, especially valence (e.g. Van Raalte et al., 1994). This has been carried out in order to gain a more detailed picture of athletes' use of self-talk. Within experimental studies, self-talk frequency is commonly assessed as part of a post-manipulation check protocol (e.g. Theodorakis et al., 2000). Nonetheless, only one study to date has explicitly examined the potential moderating effect of self-talk frequency. Hardy, Hardy, and Hall (2001) found that self-talk frequency significantly moderated self-talk valence's relationships with perceived exertion and performance. The interaction between the self-talk variables was, however, quite modest in strength. Hardy and co-workers demonstrated that increasing exertion and performance was associated with an increasing use of negative self-talk. This was counter to their a priori hypotheses. It was suggested that mood was a covariate that may help explain their findings. The exercise psychology literature suggests that the harder an individual works, the more negative their mood becomes (e.g. Parfitt, Eston, & Connolly, 1996; Parfitt, Markland, & Holmes, 1994). Negative affect has been found to be related to the use of negative self-talk (Hardy, Hall et al., 2001). Thus, the direction of self-talk's relationships with exertion and performance may be reversed. Limited support for this proposal comes from Van Raalte et al.'s (2000) study. They found a stronger relationship with tennis performance as an antecedent of self-talk than a consequence.

An issue hinted out by Hardy, Hardy et al.'s (2001) moderation finding that also has substantial importance for the practitioner focuses on if it is possible for an athlete to use self-talk too often. This has been popularly referred to as 'paralysis by analysis'. Perhaps more importantly, research on the 'conscious processing hypothesis' (Masters, 1992) and the role of implicit learning in the sport psychology literature suggests that the use of explicit rules, which can be extremely similar to instructional self-statements, can be detrimental to the performance of motor skills under pressure (see Masters, 2000 for a review). In support for the proposition that too much self-talk may be a problem, research conducted by Jackson and Wilson (1999) suggested that the use of a single as opposed to three swing thoughts, can reduce the negative effects of stress on putting performance. It should be pointed out, however, although the actual number of self-statements employed by an athlete may disrupt motor performance, the nature of the self-statements utilized might be expected to have greater influence over motor performance. For example, the previously mentioned research is most closely approximated to instructional self-talk. Thus, while increasing frequency of instructional self-talk use may (under certain circumstances) lead to a drop in performance; this may not apply to increasing utilization of motivational self-talk. It is recommended that future research explicitly address this issue as well as examine the role of the self-talk frequency dimension in general.

An overview of the nature-related components of self-talk illustrates diversity. The majority of self-talk research has tended to focus on the content of self-talk (i.e. positive and negative self-talk). It should be evident, however, that there are numerous alternative ways to classify self-talk. In fact, Diaz (1992) warns against an over reliance on the exclusive examination of the content of self-talk. One reason for

this is that one cannot make inferences from the content of self-statements about their relevance to task performance (Diaz, 1992).

In summary, it should be remembered that although each of the six aspects presented has been discussed separately, this does not reflect the overlap and interaction between the elements. An illustration of the interaction between dimensions can be seen in the work of Van Raalte et al.'s (1994, 2000) examination of the valence (positive and negative self-talk) and overtness (observable self-talk) dimensions. Moreover, to date there has generally been little attempt to directly compare the effectiveness of the self-talk categories found within the dimensions (e.g. the effectiveness of overt versus covert self-talk). Furthermore, the presentation of these components although intended to help clarify the nature of self-talk does not offer guidance with regard to basic applied questions such as, the composition of effective or appropriate self-talk, as well as the type of self-talk practitioners should encourage their athletes to use. It does, however, raise issues that future research should target. In particular, researchers are discouraged to focus exclusively on the issue of positive versus negative self-talk in order to better understand the multidimensionality of the self-talk.

## Applicable theories to understanding self-talk

Although Kerlinger (1986) has argued that theory is critical to the research process in the behavioral sciences, the self-talk literature can be legitimately criticized for its lack of theory-based research. It is possible that this may help account for our current relative lack of understanding of the construct.

### *Attentional underpinnings*

Despite the fact that self-talk researchers have suggested for some time that the effects of self-talk may work through the focusing of individuals' attention (e.g. Landin, 1994; Landin & Hebert, 1999; Mallet & Hanrahan, 1997; Ziegler, 1987), limited research attention has been paid to this proposal. Nonetheless, the concept of attention has been studied from several perspectives in both the mainstream and sports psychology literature.

One approach to the study of attention is attentional style. That is, athletes' ability to switch attention from one target to another. Nideffer (1976) proposed that attentional style is comprised of two dimensions. The first dimension refers to the width of focus, ranging from narrow (focusing on few targets) to broad (focusing on numerous targets). The second dimension refers to the direction of one's focus. That is, focusing from purely internally (i.e. thoughts and feelings) to purely externally (i.e. things happening around the athlete). Consequently, according to Nideffer four general classifications of attention exist: narrow-internal, narrow-external, broad-internal, and broad-external. It is thought that the attentional demands of different sports means that use of certain categories will be more effective than the use of others. A frequently cited example involves a soccer player, such as a central defender dribbling the ball up field on the attack, scanning the field for teammates and opponents. A broad-external focus would best suit this particular task. However, upon identifying a potential recipient of a pass, a prompt switch to a narrow-external focus would be recommended. It is possible that the use of self-talk and in particular cue words by the central defender would not only assist in an accurate switching of attentional focus but also help maintain the most appropriate focus for specific sport tasks. Researchers have yet to directly examine such performance enhancing uses of self-talk, however. Given

the conscious processing hypothesis (Masters, 1992) and attentional focus (e.g. Perkins-Ceccato, Passmore, & Lee, 2003) motor learning literatures, it could hypothesized that the most beneficial attention guiding form of self-talk for highly skilled athletes performing discrete motor skills (e.g. golf putting) would be narrow-external.

The lack of self-talk and attention oriented research may be partially accounted for by issues surrounding Nideffer's (1976) conceptual framework and the measurement of attentional style. It is recommended that self-talk researchers interested in examining this association should avoid exclusive reliance on surveys such as the Test of Attentional and Interpersonal Styles (Nideffer, 1976). The employment of multiple strategies to the assessment of attention (e.g. eye gaze, psycho-physiological variables, surveys, and thought content analysis) is preferred (Hardy et al., 1996).

While self-talk might influence one's attentional focus in a performance-enhancing manner, direct empirical examination of this hypothesis and the measurement of attention have been extremely limited in the self-talk literature. Although attentional focus has not been treated as a dependent or outcome variable, in its own right, preliminary support reflecting the possibility of attentional focus as an underpinning mechanism for self-talk's effects has been generated (e.g. Landin & Hebert, 1999). In two water-polo related experiments, Hatzigeorgiadis et al. (2004) found that improved performance and less self-reported interfering thoughts accompanied instructional and motivational self-talk interventions. Future research is needed, however, to follow-up and extend these findings. For example, the replication of such findings via the utilization of more objective measures of attention would strengthen the claim that one way self-talk can enhance performance is through alteration of attentional focus. It should be noted, however, it is unlikely that self-talk's possible influence on performers' attention adequately explains the influence of self-talk. As a result, it is most likely that reliance on the concept of attention as an explanation for self-talk's impact is restricting, albeit one that dovetails with the use and proposed effects of instructional self-talk; when conceptualized as an independent variable.

### *Information processing perspectives*

An alternative explanation for the effect of self-talk orients around athletes' information processing (Landin, 1994) and related use of rules to control behavior (Hayes, 1989). Landin proposed that verbal cues could influence all three functions of information processing to positively influence performance: (a) perceptual processing; (b) decision processing; and (c) effector processing (Wrisberg, 1993). While the first two functions have a stronger association to skill acquisition than skill execution, the effector processing function has links to both. Thus, Landin suggests that verbal cues may help the beginners' search for correct task stimuli, as well as aid the decision-making process by reducing the number options available. Once the correct decision has been made, verbal cues can be forwarded to positively impact the effector processing function in two ways. First, verbal cues can be used to ready the body for action (e.g. the 'set' immediately prior to race initiation). Second, verbal cues can assist in the 'chunking' of multiple discrete aspects of an appropriate complex movement sequence. This in turn means that little attention is required during the performance of movement 'chunks'. Attention/information processing is, however, required at the start of each 'chunk' (Magill, 2001).

The use of rules to govern control over behavior can reduce the amount of information needed to be processed, thus aiding decision-making. Rule-governed behavior is "behavior that is controlled by the statement of a rule" (Ming & Martin, 1996, p. 236). It differs from contingency-shaped behavior in that the latter is situationally specific behavior strengthened directly by the effects of consequences (Ming &

Martin, 1996). The essence of a rule-govern statement is that specific behaviors will pay off in certain situations. Complete rules are statements that include antecedents, behaviors, and consequences. Partial rules, however, do not include all three aspects, yet are still potent in their effect. An example may help to clarify the similarities and differences. A golfer's complete rule-governed statement may be "if I keep my head still then I will strike the ball cleanly". The rule 'head still' is an antecedent to the desired behavior that will in turn lead to the reinforcer, a clean strike. The same golfer's partial rule statement (a more realistic situation) may be simply 'head'. Hayes (1989) proposes that the correct use of rules can influence changes in behavior more quickly than trial and error experiences. The presence and usefulness of partial rule-governed statements has overlap with self-talk and the phenomenon of its abbreviation. It is suggested that the two information-processing perspectives presented have greater relevance to the instructional aspects as compared to the motivational aspects of self-talk.

### *Self-efficacy theory*

Bandura's (1997) self-efficacy theory is another possible theory applicable to the study of self-talk that has yet to be fully embraced by researchers interested in understanding self-talk. Bandura (1997, p. 3) defined self-efficacy as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments". Strengths of self-efficacy theory are its testable predictions and parsimony.

Bandura (1997) proposed a number of sources for efficacious beliefs: (a) previous performance accomplishments; (b) vicarious experiences; (c) verbal persuasion; and (d) interpretation of physiological and affective states. Of particular relevance to self-talk is the third source of efficacy information, as the origin of verbal persuasion can be from others as well as the self. The importance of the credibility of the source of persuasion should be noted, however. That is, Bandura proposes that persuasive sources that are viewed by the recipient as being knowledgeable, and possessing task experience and expertise as having greatest persuasory potential. At a superficial level, it would seem that elite athletes may be perfectly positioned to benefit the most from persuasory self-talk.

Although verbal persuasion has been proposed to be a limited source of self-efficacy, Bandura (1997) has suggested that persuasive statements can be a useful adjunct efficacy source. Recent research offers support to this proposition. Wise and Trunnell (2001) varied the order of performance accomplishment, vicarious experience and verbal persuasion efficacy sources for a maximal bench press task. When the verbal persuasion statement given by a third person followed performance accomplishment, an increase in self-efficacy was demonstrated. It was suggested that the persuasive statement offered reinforcement to beliefs formed following a performance accomplishment. It must be noted, however, that the source of the persuasive message was not self-talk but rather was given by a certified strength and conditioning research assistant.

Rather than a source of self-efficacy, as described up to this point, it is possible that self-talk may play the role of a mediator within the confidence related construct's relationships. Drawing from Bandura's (1997) predictions, it would be hypothesized that self-efficacy will impact on athletes' emotional experiences via thought control (which could be operationalized to a limited extent as self-talk). Although Hardy, Hall et al. (2001) found initial support for a link between self-talk (valance and directional motivation interpretation) and core affect, the theory-based mediatory role of self-talk has not been tested.

In fact, very limited self-talk research has been conducted with a focus on self-efficacy theory although it is possible to interpret previous self-talk studies as offering very preliminary support for the

application of the theory. For example, although self-efficacy was not measured, the beneficial performance effects of positive ('I can') self-talk (Van Raalte et al., 1995) might be explained in terms of increased efficacy. Furthermore, Weinberg, Grove, and Jackson (1992) reported that tennis coaches frequently cited the promotion of positive self-talk as an efficacy building strategy. Landin and Hebert (1999) used varsity standard tennis players in a cue word, single-subject design study. Although increases in self-efficacy were found, this was not the primary purpose of the study and so this increase was not tested statistically. More recently, Hardy et al. (in press-a) found preliminary support for a positive association between self-efficacy to perform a crunch sit-up task and the valance, as well as the directional interpretation dimensions of self-talk. To date, there has yet to be an in-depth examination of self-talk's possible relation with self-efficacy. Self-efficacy theory warrants explicit examination in relation to self-talk. This is because both instructional and motivational aspects of self-talk may influence self-efficacy. That is, self-talk may not only help increase athletes' confidence that they can achieve sporting goals, but may also be useful in offering instruction on how to achieve such goals. Future research not only needs to explicitly address relatively basic research questions, such as, establishing the causal direction of a self-talk–self-efficacy association but also explore more applied aspects of this theoretically derived relationship. Perhaps most pressing of these is how should athletes most effectively employ self-talk when attempting to boost their self-efficacy?

### *Vygotsky's theory of cognitive development*

Another theory that seemingly has application to self-talk is Vygotsky's (1986) verbal theory of self-regulation. This theory proposes that human's develop cognitively to use language as a tool for thought. Vygotsky distinguishes between at least two forms of language: social speech and private speech (i.e. overt self-talk). This distinction reflects two very different functions of language, communicative and regulatory. This was one of the first verbal self-regulation theories to distinguish between speech for others and speech for the self (Ramirez, 1992). According to Vygotsky, overt self-talk bridges social speech and covert self-talk. Thus, as a child develops they will increasingly employ self-talk that becomes more abbreviated and internalized. Covert self-talk is in effect, a more sophisticated level of cognitive functioning as compared to overt self-talk. This is not to say that adults never use overt self-talk in everyday life. Although adults may utilize overt self-talk relatively infrequently, such speech would be predicted by the theory to be demonstrated in demanding and challenging situations (e.g. learning novel tasks, public speaking, when under pressure). Although Van Raalte et al. (2000) did not explicitly examine this theory; their results utilizing an observation technique offer some support to its applicability. Tennis players were found to use overt self-talk in what might be conceived as pressure situations such as, when serving, after service games were broken, when receiving service, and after losing points. Vygotsky not only suggests that overt and covert self-talk are similar to each other, as they are both speech for the self, but they also have structural similarities—abbreviation.

The sporting self-talk literature has touched upon this issue. Numerous studies provide support for the use of cue words (i.e. abbreviated self-talk) as a technique to increase performance. For example, Landin and Hebert (1999) assigned the cue words 'split' and 'turn' in order to improve the volleying technique of varsity standard tennis players. These cues were constructed to represent phases of the net volley stroke; splitting the legs shoulder width apart for a balanced position and then to remind the tennis player to turn the shoulders in order to reduce excessive racket head movement. Quantitative and qualitative improvements were observed. Another illustration of the effectiveness of cue words comes from a

sample of elite Australian sprinters. Mallet and Hanrahan (1997) assigned the sprinters the words 'push', 'heel', and 'claw' to be verbalized during the 0–30, 30–60, and 60–100 m phases of a 100 m sprint. An approximate 2% increase in performance was witnessed—a practically important improvement, given the elite nature of the sample.

Vygotsky (1986) expands the notion of abbreviation to include not only grammatical but psychological abbreviation. Thus, the subject or focus of the self-talk need not be present; the speaker automatically knows what it is they are talking about. Although Vygotsky's theory offers some insight into individuals' use of self-talk, to date, sport self-talk researchers have not examined the utility of Vygotsky's theory to their own domain of interest. Given that his theory would predict changes in the use of self-talk across challenging pressure filled and pressure less situations, it would seem that examination of the theory's predictions would be quite informative, especially with regard to differences in the use of self-talk across competition and practice settings. Initial research by Hardy, Hall et al. (2001) and Hardy et al. (in press-b) has identified differences in the use of self-talk across these two settings. Moreover, given that some athletes may spend up to 90% of their time training and practicing, future research should focus on this much overlooked athletic context.

### *Imagery models*

The aspect of psychological subject of self-talk or the focus of the self-talk has overlap with one of the key components of Ashen's (1984) ISM triple-code mental imagery model-meaning. According to Ashen, it is possible for two imagers to imagine exactly the same images but have very different interpretations of the same imagery content. Consequently, the meaning of an image is idiosyncratic and personal to the imager. It could be argued that the same is true for the meaning associated with an individual's self-talk (e.g. motivational interpretation dimensions). Although Ashen's model focuses on mental imagery rather than self-talk and so may seem a little out of place within a section on theories applicable to self-talk, there are other mental imagery related models that incorporate verbalizations as an integral aspect of each respective model. For example, Paivio's (1971) dual coding theory of verbal and non-verbal (or imaginal) coding is perhaps the most well known. This theory not only distinguishes between these two different ways of processing information, an issue explored by O'halloran and Gauvin (1994), but the meaning (or semantic representation) associated with images and words is also emphasized.

The Action–Language–Imagination (ALI) model of motor imagery (Annett, 1988) proposes a close link between imagery and a verbal system for processing information in the motor domain. According to Annett, motor imagery forms a bridge between two independent information-encoding systems. Thus, the motor system is responsible for the encoding of human actions via demonstration, whereas the verbal system is related to information acquired from spoken and/or written instructions. The action–language bridge, served by motor imagery, allows actions to be described, actions to be created, as well as allowing the individual to be able to respond to verbal instruction. Annett (1994) summarized the supportive evidence for the pivotal role of imagery. Moreover, in line with the predictions of the ALI model, Hall, Moore, Annett, and Rodgers (1997) demonstrated that subjects assigned to an imagery plus verbal cues treatment group learned more movement patterns than subjects performing either strategy separately (as cited by Hall, 2001). A sports example may help to illustrate the role of actions, language, and imagery. A squash professional teaching a novice how to stand in preparation to receive a service could demonstrate the correct stance, and/or offer verbally instructions regarding where his/her feet

should be positioned and how the novice should hold the squash racquet. It might be most efficient, however, if the professional simply asked the beginner to stand like a "[Native North American] Indian on the war-path waving a tomahawk" (Annett, 1994, p. 13). There are some interesting applications of Annett's ALI model. For example, can self-talk be used on its own, or is there an additive effect for the use of self-talk with mental imagery? With regard to the ALI model's pertinence to self-talk it is proposed that this is restricted to the instructional aspects of the mental skill.

In closing, please note that the theoretical approaches to the study of self-talk presented in this section vary in both their applicability and the amount of previously conducted research with an emphasis on self-talk. Furthermore, it is unlikely that the approaches forwarded are sufficiently thorough on their own to fully explain every aspect of self-talk. It is suggested, however, that Bandura's (1997) self-efficacy theory has particular relevance to the study of self-talk, as it seems to have application to both its instructional and motivational aspects and allows investigators to conceptualize self-statements as an independent, mediating, or dependent variable.

## Acknowledgements

The author would like to thank Drs. Mark Eys, Craig Hall, and Sheldon Hanton, as well as two ananymous reviewers, for their insightful comments on earlier versions of this manuscript.

## References

Ahsen, A. (1984). ISM: The triple code model for imagery and psychophysiology. *Journal of Mental Imagery*, *8*, 15–42.

Annett, J. (1988). On knowing how to do things. In H. Heuer, & C. Fromm (Eds.), *Generation and modulation of action patterns*. London: Martinius Nijhoff Publishers.

Annett, J. (1994). The learning of motor skills: Sports science and ergonomics perspectives. *Ergonomics*, *37*, 5–15.

Bandura, A. (1997). *Self-efficacy: the exercise of control*. New York: Freeman.

Bull, S. J. (1991). Personal and situational influences on adherence to mental skills training. *Journal of Sport and Exercise Psychology*, *13*, 121–132.

Bunker, L., Williams, J. M., & Zinsser, N. (1993). Cognitive techniques for improving performance and building confidence. In J. M. Willaims (Ed.), *Applied sport psychology: Personal growth to peak performance*2nd ed.. Mountain View, CA: Mayfield.

Carron, A. V. (1993). The Coleman Roberts Griffith address: Toward the integration of theory, research, and practice in sport psychology. *Journal of Applied Sport Psychology*, *5*, 207–221.

Carron, A. V., Brawley, L. R., & Widmeyer, W. N. (1998). The measurement of cohesiveness in sport groups. In J. L. Duda (Ed.), *Advances in sport and exercise psychology measurement*. Morgantown, WV: Fitness Information Technology Inc.

Chroni, S. (1997). Effective verbal cues make the skier's and coach's lives easie *American Ski Coach*, *18*13–14,19.

Dagrou, E., Gauvin, L., & Halliwell, W. (1992). Effets du langage positif, négatif, et neuter sur la performance motrice [Effects of positive, negative, and neutral self-talk on motor performance]. *Canadian Journal of Sports Sciences*, *17*, 145–147.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self determination in human behavior*. New York: Plenum Press.

Diaz, R. M. (1992). Methodological concerns with private speech. In R. M. Diaz, & L. E. Berk (Eds.), *Private speech: From social interactions to self-regulation*. Hillsdale, NJ: Lawrence Erlbaum.

Goodhart, D. E. (1986). The effects of positive and negative thinking on performance in an achievement situation. *Journal of Personality and Social Psychology*, *51*, 117–124.

Greenspan, M. J., & Feltz, D. L. (1989). Psychological interventions with athletes in competitive situations: A review. *The Sport Psychologist*, *3*, 219–236.

Hackfort, D., & Schwenkmezger, P. (1993). Anxiety In R.N. Singer, M. Murphey, & L.K. Tennant, (Eds.). *Handbook of research on sport psychology* (pp. 328–364). New York: Macmillan.

Hall, C.R. (2001). Imagery in sport and exercise. In R. Singer, H. Hausenblas, & C. Janelle (Eds.). *Handbook of sport psychology* (2 nded., pp. 529–549). New York: Wiley.

Hall, C., Moore, J., Annett, J., & Rodgers, W. (1997). Recalling demonstrated and guided movements using imaginary and verbal rehearsal strategies. *Research Quarterly for Exercise & Sport*, *68*, 136–144.

Hanton, S., & Jones, G. (1999). The effects of a multimodal intervention program on performers. II. Training the butterflies to fly in formation. *The Sport Psychologist*, *13*, 22–41.

Hardy, J., Gammage, K., & Hall, C. R. (2001). A description of athlete self-talk. *The Sport Psychologist*, *15*, 306–318.

Hardy, J., Hall, C. R., & Alexander, M. R. (2001). Exploring self-talk and affective states in sport. *Journal of Sport Sciences*, *19*, 469–475.

Hardy, J., Hall, C. R., Gibbs, C., & Greenslade, C. (in press-a). Self-talk and gross motor skill performance. Athletic Insight.

Hardy, J., Hall, C. R., & Hardy, L. (2004). A note on athletes' use of self-talk. *Journal of Applied Sport Psychology*, *16*, 251–257.

Hardy, J., Hall, C. R., & Hardy, L. (in press-b). Quantifying athletes' self-talk. *Journal of Sport Sciences*.

Hardy, J., Hardy, L., & Hall, C. R. (2001). *Self-talk and perceived exertion in physical activity*. Poster presented at the meeting of the Association for the Advancement of Applied Sport Psychology, Orlando, FL.

Hardy, L., Jones, G., & Gould, D. (1996). *Understanding psychological preparation for sport: Theory and practice of elite performers*. Chichester: Wiley.

Harvey, D. T., Van Raalte, J. L., & Brewer, B. W. (2002). Relationship between self-talk and golf performance. *International Sports Journal*, *6*, 84–91.

Hayes, S. C., Rosenfarb, I., Wulfert, E., Munt, E. D., Korn, Z., & Zettle, R. D. (1985). Self-reinforcement: An artifact of social standard setting? *Journal of Applied Behavior Analysis*, *18*, 201–214.

Hayes, S. C. (Ed.). (1989). *Rule-governed behavior: Cognition, contingencies, and instructional control*. New York: Plenum Press.

Hatzigeorgiadis, A., Theodorkis, Y., & Zourbanos, N. (2004). Self-talk in the swimming pool: The effects of self-talk on though content and performance on water-polo tasks. *Journal of Applied Sport Psychology, 16*,138–150.

Highlen, P. S., & Bennett, B. B. (1983). Elite divers and wrestlers: A comparison between open- and closed-skill athletes. *Journal of Sport Psychology*, *5*, 390–409.

Jackson, R.C., & Wilson, R. (1999). Using 'swing thoughts' to prevent paradoxical performance effects in golf putting In M.R. Farrally & A.J. Cochran (Eds.), *Science and golf III: Proceedings of the world scientific congress of golf* London: E & F.N. Spoon.

Jones, G., Swain, A. B. J., & Hardy, L. (1993). Intensity and direction dimensions of competitive state anxiety and relationships with performance. *Journal of Sports Sciences*, *11*, 525–532.

Kerlinger, F. N. (1986). *Foundations of behavioral research*(3rd ed.). New York: Holt, Rinehart, & Winston.

Kyllo, L. B., & Landers, D. M. (1995). Goal setting in sport and exercise: A research synthesis to resolve the controversy. *Journal of Sport and Exercise Psychology*, *17*, 117–137.

Landin, D. (1994). The role of verbal cues in skill learning. *Quest*, *46*, 299–313.

Landin, D., & Hebert, E. P. (1999). The influence of self-talk on the performance of skilled female tennis players. *Journal of Applied Sport Psychology*, *11*, 263–282.

Lazarus, R. S. (1982). Thoughts on the relation between emotion and cognition. *American Psychologist*, *37*, 1019–1024.

MacKay, D. G. (1992). Construction on theories of inner speech. In d. reisberg (Ed.), Auditory imagery (pp. 121–149). Hillsdale, NJ: Lawerence erlbaum Associates.

Magill, R. A. (2001). *Motor learning: Concepts and applications*(6th ed.). New York: McGraw-Hill.

Mahoney, M. J., & Avener, M. (1977). Psychology of the elite athlete: An exploratory study. *Cognitive Therapy and Research*, *6*, 225–342.

Mallet, C. J., & Hanrahan, S. J. (1997). Race modeling: An effective strategy for the 100 m sprinter? *The Sport Psychologist*, *11*, 72–85.

Masters, R. S. W. (1992). Knowledge, knerves and know-how: The role of explicit versus implicit knowledge in the breakdown of a complex motor skill under pressure. *British Journal of Psychology*, *83*, 343–358.

Masters, R. S. W. (2000). Theoretical aspects of implicit learning in sport. *International Journal of Sport Psychology*, *31*, 530–541.

Ming, S., & Marten, L. G. (1996). Single-subject evaluation of ST package for improving figure-skating performance. *The Sport Psychologist*, *10*, 227–238.

Moran, P. A. (1996). *The psychology of concentration in sport performance*. East Sussex, UK: Psychology Press Publishers.

Nideffer, R. M. (1976). Test of attentional and interpersonal style. *Journal of Personality and Social Psychology*, *34*, 394–404.

O'halloran, A., & Gauvin, L. (1994). The role of preferred cognitive style in the effectiveness of imagery training. *International Journal of Sport Psychology*, *25*, 19–31.

Paivio, A. U. (1971). *Imagery and verbal processes*. New York: Holt, Rinehart, & Winston.

Palmer, S. L. (1992). A comparison of mental practice techniques as applied to the development in competitive figure skating. *The Sport Psychologist*, *6*, 148–155.

Parfitt, C. G., Eston, R. G., & Connolly, D. (1996). Psychological affect at different ratings of perceived exertion in high-and low-active women: A study using a production protocol. *Perceptual and Motor Skills*, *82*, 1035–1042.

Parfitt, C. G., Markland, D. A., & Holmes, C. (1994). Responses to physical exertion in active and inactive males and females. *Journal of Sport and Exercise Psychology*, *16*, 178–186.

Perkins-Ceccato, N., Passmore, S. R., & Lee, T. D. (2003). Effects of focus of attention depend on golfers' skill. *Journal of Sports Sciences*, *21*, 293–600.

Perkos, S., Theodorakis, Y., & Chroni, S. (2002). Enhancing performance and skill acquisition in novice basketball players with instructional self-talk. *The Sport Psychologist*, *16*, 368–383.

Peters, H. J., & Williams, J. M. (2003). *What type of self-talk do athletes believe help and hurt their performance?* Poster presented at the meeting of the Association for the Advancement of Applied Sport Psychology, Philadelphia.

Ramirez, J. D. (1992). The functional differentiation of social and private speech: A dialogic approach. In R. M. Diaz, & L. E. Berk (Eds.), *Private speech: From social interaction to self-regulation* (pp. 199–214). Hillsdale, NJ: Lawrence Erlbaum Associates.

Rushall, B. S., Hall, M., Roux, L., Sasseville, J., & Rushall, A. S. (1988). Effects of three types of thought content instructions in skiing performance. *The Sport Psychologist*, *2*, 283–297.

Theodorakis, Y., Chroni, S., Laparidis, K., Bebestos, V., & Douma, I. (2001). Self-talk in a basketball-shooting task. *Perceptual and Motor Skills*, *92*, 309–315.

Theodorakis, Y., Weinberg, R., Natsis, P., Douma, I., & Kazakas, P. (2000). The effects of motivational and instructional self-talk on improving motor performance. *The Sport Psychologist*, *14*, 253–271.

Van Noorde, N. L. (1984). *Development and evaluation of a self-talk assessment instrument for tennis players*. Unpublished doctoral dissertation, Michigan State University, East Lancing, MI.

Van Raalte, J. L., Brewer, B. W., Lewis, B. P., Linder, D. E., Wildman, G., & Kozimor, J. (1995). Cork! The effects of positive and negative self-talk on dart throwing performance. *Journal of Sport Behavior*, *18*, 50–57.

Van Raalte, J. L., Brewer, B. W., Rivera, P. M., & Petitpas, A. J. (1994). The relationship between observable self-talk and competitive junior tennis players' match performance. *Journal of Sport and Exercise Psychology*, *16*, 400–415.

Van Raalte, J. L., Cornelius, A. E., Brewer, B. W., & Hatton, S. J. (2000). The antecedents and consequences of self-talk in competitive tennis. *Journal of Sport and Exercise Psychology*, *22*, 345–356.

Vygotsky, L. S. (1986). *Thought and language (A. Kozulin, Trans.)*. Cambridge, MA: MIT Press (Original work published 1934).

Weinberg, R., Grove, R., & Jackson, A. (1992). Strategies for building self-efficacy in tennis players: A comparative analysis of Australian and American coaches. *The Sport Psychologist*, *6*, 3–13.

Weinberg, R. S. (1988). *The mental advantage: Developing your psychological skills in tennis*. Champaign, IL: Human Kinetics.

White, A., & Hardy, L. (1995). Use of different imagery perspectives on the learning and performance of different motor skills. *British Journal of Psychology*, *86*, 169–180.

Wise, J. B., & Trunnell, E. P. (2001). The influence of sources of self-efficacy upon efficacy strength. *Journal of Sport and Exercise Psychology*, *23*, 268–280.

Wrisberg, C. A. (1993). Levels of performance skill. In R. N. Singer, M. Murphey, & L. K. Tennant (Eds.), *Handbook of research on sport psychology* (pp. 61–71). New York: Macmillan, 61–71.

Ziegler, S. G. (1987). Effects of stimulus cueing on the acquisition of groundstrokes by beginning tennis players. *Journal of Applied Behavior Analysis*, *20*, 405–411.

View publication stats