

**INVESTIGATING SELF-TALK USE AMONG BATSWANA BOXING ATHLETES:  
IMPLICATIONS FOR TAILORED SKILL-TARGETED SELF-TALK  
INTERVENTIONS**

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## **ABSTRACT**

Self-talk intervention studies in sport abound with research mainly conducted among populations in the west, on non-competitive settings, targeting non-combat sport. Generally, intervention studies have not demonstrated the sequential use of mixed methods to conduct self-talk needs assessment prior to planning and implementation of self-talk strategies. Consequently, the thesis aimed to use mixed methods to explore self-talk use among Batswana boxers and ultimately test a tailored skill targeted self-talk intervention among the participating boxers. The thesis comprised five studies: a systematic review of existing self-talk intervention studies, exploring self-talk use among Batswana boxers using retrospective interviews, exploring the participants self-talk use in real-time, investigating the boxers' perceived coaching behaviour influence, and investigating the effectiveness of a tailored skill targeted self-talk intervention among participating Batswana boxers. Study one was a systematic review of trends in specified intervention design, context, and implementation components. Studies Two to Five were sequentially conducted in Botswana from 2017 – 2019. Thesis demonstrated novelty in several ways, for instance: (1) investigated self-talk in a population (Batswana) not studied before; (2) conducted self-talk research (intervention) in a sport not investigated before; (3) sequentially used different approaches to inform a tailored skill-targeted self-talk intervention; and (4) demonstrated participants' engagement in the different empirical studies. The thesis has added to current knowledge by demonstrating: (1) the practicality of the framework for the study of self-talk in sport (Hardy et al., 2009) in the boxing context, and (2) the effectiveness of self-talk use in both training and competition context among Batswana boxers.

## ***Study One***

Study one aimed to review trends in the self-talk intervention and performance literature and identify interactions between intervention design, context, and implementation. The study scrutinised design (self-talk type, task novelty, study design, and task goal targeted), context (type of sport, geographical location, and intervention setting), and implementation (self-talk practice, intervention duration, testing, and manipulation check) trends. Seventy-five intervention studies were included following set criteria. Overall, the study identified trends within design, context, and implementation that indicate variables that have been studied extensively and those that lag. As well, the study noted that scrutiny of intervention complexities is a research area needing attention. This study informed the rest of the thesis by importantly, making a case for self-talk investigation among Batswana, targeting the sport of boxing and boxers of varying skill and competition experience levels.

## ***Study Two***

The present study aimed to explore Batswana boxing athletes' self-talk awareness, beliefs and uses with intent to inform a tailored skill-targeted self-talk intervention. Semi-structured interviews were used to collect data from 17 Batswana boxers (14 males and 3 females) recruited from boxing clubs in Gaborone, Botswana, through gatekeepers. Inclusion criteria entailed: (1) at least 12 months boxing experience, (2) at least one competitive experience, (3) being Motswana, and (4) playing the sport in Botswana. Seventeen data sets were analysed using the thematic analysis approach (Clarke & Braun, 2013). Study credibility was assessed using eight criteria for excellent qualitative research (Tracy, 2010). The analysis derived primary and secondary themes relating to self-talk utilisation, awareness, belief, context, content, influences, and uses. Batswana boxing athletes reported using self-talk, with several indicating self-talk unawareness prior to the interview. The boxers reported belief in their self-talk and using self-talk across training and competition settings. The study also identified factors influential to boxers' self-talk use, as well as distinct structure form and person terms characteristics. In several ways, findings echo early descriptive results, and propositions made by models in self-talk and sport research. Results suggest the possible value of semi-structured interviews as a tool to explore individual athletes' self-talk use, strengths, and needs, for purposes of formulating tailored skill-targeted self-talk interventions. Also, the findings suggest the role of retrospective recall approach in rousing awareness of self-talk use and potential thereof to encourage use of the strategy. Importantly, findings suggest the possible use of self-talk strategy and perceived value thereof among Batswana boxers. The study findings also point to the need for further research investigating actual self-talk use among boxers, Batswana, and athletes in general.

### ***Study Three***

This study aimed to explore Batswana boxers' self-talk use in real time (during training) and compare findings with retrospective recall findings of study two. The study findings would validate study two findings and inform a tailored, skill-targeted self-talk intervention. The (TA) method was used to capture athletes' self-talk during two noncontact training activities, shadow boxing and punch bag. Twelve Batswana boxers recruited in boxing clubs around Gaborone took part in the study ( $n = 12$ ). Participation in study two was necessary for inclusion in the current study. The study used the realist approach. Clarke and Braun's (2013) thematic analysis phases were used to analyse the data sets. Credibility was assessed using eight criteria for excellent qualitative research (Tracy, 2010). Findings revealed that participating boxers used self-talk that served instructional and motivational purposes, particularly the former. The boxers' self-talk was characterised in distinct structure form and person terms. The findings were like study two results in terms of self-talk function, self-talk structure, and person terms used. Differences were noted in self-talk prevalence, with real time self-talk recording remarkably more self-talk than retrospective recall reports. The findings boost initial studies, which provided validation for retrospective recall reports. The findings also harmonise with the self-talk functions aspects of self-talk models (Hardy et al., 2009; Van Raalte et al., 2016). TA and retrospective recall findings may provide insights on individual athletes' self-talk use needs, and hint to skills strengths and deficits, informing intervention direction. Similarities and differences between actual and reported self-talk suggest the potential for the think aloud and interview methods to be complementary during needs analysis. Further research is paramount to validate the possible complementary role of the TA and interviews when used sequentially. Findings have implications for method, theory, practice, and research.

## **Study Four**

The study sought to explore perceived coaching behaviour influence on participating boxers self-talk during competition. First, the study attempted to identify specific coaching behaviours perceived as influential and then assess ways such behaviour is perceived to be influential. Eleven boxers participated in the study which utilised video assisted interviews following a local tournament. Individual participants and the researcher watched their bout concurrently as they listened to an audio recording of the coach during the same bout. The study did not find enough data to support study two findings regarding perceived coaching behaviour on boxers' self-talk. The study however pointed to perceived coaching behaviour influence in decision making during competition. Coaching instructions was the behaviour reported to be influential, and the influence was noted even when coaches' instructions were in audible. The study would have benefited from follow up interviews to extract more information. Further research could revisit the interview guide and consider ways the study may have met the aims.

## **Study Five**

The primary aim of the study was to investigate the effectiveness of a tailored skill-targeted self-talk intervention among skilled and competitive Batswana boxing athletes in training and competition. To achieve the primary aim the study had three objectives: (1) To examine the effectiveness of a tailored skill-targeted self-talk intervention on individual boxing athletes' straight, uppercut, and hook punches during sparring and competition, (2) To investigate the effectiveness of a tailored skill-targeted self-talk intervention on individual boxing athletes' guards use during sparring and competition, and (3) To highlight perceived usefulness of a tailored skill-targeted self-talk intervention on individual athletes' holistic performance during competition. Six boxing athletes took part in the intervention study following participation in a self-talk needs analysis process. The study found improvements in some punch accuracy for most boxers, and no performance hindrance to boxers' offense. The study also found improvements in guards use (defense), and no hindrance to defense where there was no recorded improvement. Also, non-targeted defense moves were not hampered in the process. The boxers achieved personal goals – winning National Championship medals. The boxers socially validated the usefulness of the intervention. The findings provide initial evidence for the effectiveness of a tailored and skill targeted self-talk intervention, in the sport of boxing and among Batswana athletes.

## **2 DECLARATION**

I declare that the work contained in this thesis is my work.



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## **GLOSSARY OF TERMS**

Motswana                      A person (singular) from the country Botswana.

Batswana                     People (plural) from the country Botswana

## **LIST OF ABBREVIATIONS**

Abbreviation	Full-term
BoBA	Botswana Boxing Association
TAT	Technical Advisory Team
TA	Think Aloud
IST	Instructional self-talk
MST	Motivational self-talk
SCID-5-PD	Structured Clinical Interview for DSM-5R Personality Disorders

# CHAPTER 1

## Introduction

### 1.1 The Subject at Glance

A quote, “be careful how you are talking to yourself for you are listening,” (Hayes, 2017, p. 1) hints to the importance of regulating one’s self-talk. In the men’s triple jump final at the Rio 2016 Olympics Games Christian Tylor could be observed and heard saying something seconds before making his run for the jump, doing so in each of his final three jumps. Prior to the first of the three jumps he shouted, “let’s go!” Then seconds before his second jump he again shouted but a different phrase, “right now!” followed by a scream, “haaaaaa!” Each of the two jumps were superior to that of two other remaining finalists. Being the first in the line-up Taylor made his final jump ahead of his competitors. Seconds before the final jump he shouted, “close the door!” then made his Rio 2016 Olympics Games final jump.

Commenting on Tylor’s phrase, “close the door!” the commentators remarked that Taylor wanted “a safety valve with his final...to put the jump beyond reach.” Taylor successfully defended his title becoming a two-time Olympics triple jump champion

(<https://www.youtube.com/watch?v=Rmb48a2t008>). Several questions can be asked about Christian Taylor’s observed practice: What purpose did Taylor’s phrases ahead of each of his jumps serve? What meaning did he place on each of the phrases? Even more, did the phrases, “let’s go!” “right now!” and “close the door!” have an impact on his final performance helping him to win a second Olympic gold medal? Questions could even be raised about whether he uses similar phrases during training. These are among the questions that self-talk research has explored for four decades.

Self-talk, a term commonly used to refer to when individuals say something to themselves is among the mental skill practices widely researched in applied sport science.

However, in sport science research self-talk is not as simple a concept and practice as to purely refer to when individuals talk to themselves. Over the years researchers have used varying definitions in the study of self-talk (e.g. Bunker et al., 1993; Hackfort & Schwenkmezger, 1993; Hardy, 2006; Theodorakis et al., 2000; Van Raalte et al., 2016). Noting flaws in definitions that were in use at the time, Hardy (2006) put forward a working definition for the study of self-talk in sport, defining self-talk as “verbalised self-directed statements which have interpretive elements, are multidimensional in nature, somewhat dynamic, and serve at least both the instructional and motivational functions, for the athlete” (Hardy, 2006, p. 84). Accordingly, the current study defines self-talk as meaningful self-selected or assigned statements, which athletes covertly or overtly say to themselves for at least a motivational or instructional purpose (Hardy, 2006) in a sporting context. A clear definition allows research to investigate questions including those posed in reference to the Olympics champion Christian Taylor’s self-talk use (e.g. What function did Taylor’s self-talk serve? What meaning if any did Taylor attach to his self-talk cues?).

Growth in self-talk research has been highlighted in synthesis (e.g., Hatzigeorgiadis et al., 2011), review (e.g., Tod et al., 2011), and reflective (Hardy et al., 2018) papers. Retrospective recall approaches have pointed to the relationship between self-talk use and sport performance (e.g., Hardy et al., 2001; Miles & Neil, 2013; Van Dyke et al., 2018). Experimental studies have shown causation between self-talk and sport performance (e.g., Abdoli et al., 2018; de Matois et al., 2020; DeWolfe et al., 2020; Hatzigeorgiadis et al., 2011; McCormick et al., 2018). These different approaches to the study of self-talk, spanning decades, continue to play a role in the growing self-talk literature, in sport. This growth is evidence that progress made on studying the effects of self-talk use on different performance variables such as accuracy, distance, endurance, body movement, and speed has been scrutinised (e.g., Hatzigeorgiadis et al., 2011). As well, growth has seen a coverage of a



spectrum of sports including basketball (e.g., Galanis et al., 2018), cycling (e.g., Hatzigeorgiadis et al., 2018), ultra marathon (e.g., McCormick et al., 2018), football (e.g., Zourbanos et al., 2013a), and volleyball (e.g., Shariati & Kalhoran, 2016).

The increase in sport related self-talk research has contributed to advances in sport self-talk models such as Hardy and associates' (2009) and Van Raalte, Vincent, and Brewer's (2016) self-talk models. Further, growth in self-talk research in sport has also sparked captivating debates on self-talk categorisations (e.g., Latinjak et al., 2019; Van Raalte et al., 2019). Self-talk frameworks, reviews, debates, and research in general have inspired and challenged researchers to go beyond a focus on the self-talk and performance relationship to also investigate self-talk moderators and mediators (e.g., Hardy et al., 2009; Hatzigeorgiadis et al., 2011; Tod et al., 2011). There are indications that researchers are indeed broadening focus to include self-talk moderators and mediators (e.g., Galanis et al., 2018; McCormick et al., 2018). While acknowledging noteworthy strides prevailing self-talk research has made in heightening our comprehension of self-talk's role in sporting performance, several issues are raised.

Although self-talk and performance research abounds, research in African contexts is lacking, with a single-subject study (n=4) conducted in Nigeria (Adeyeye et al., 2013), the sole intervention study documented. Yet, early cross-cultural self-talk research suggested the need for further investigations on the subject, across cultures (e.g., Peters & Williams, 2006). Cross cultural research can enhance our current understanding of athletes' self-talk use (Hardy et al., 2018). Such understanding is necessary for practice. Secondly, in documented research there is an apparent lack of athletes' involvement during the intervention formulation phase. Studies have not demonstrated that assessment and understanding of intervention recipients' skills needs preceded interventions. Instead, researchers mostly

assigned self-talk cues without first demonstrating that they determined self-talk and skills needs for individual and groups of athletes.

Few studies utilised competition (McCormick et al., 2018; Hatzigeorgiadis et al., 2014) and real training settings (e.g., Koloventis et al., 2012; Slimani & Cheour, 2016), hence little is known about the effectiveness of self-talk in non-ideal and uncontrolled environments. In real life settings athletes face factors beyond personal variables, including environment, and significant others factors. Although there is confidence on self-talk intervention efficacy, confidence on the strategy's effectiveness is not solid. Moreover, few studies employed elite performers, limiting knowledge, and understanding of self-talk use among highly skilled and experienced athletes. Finally, few studies have investigated the use of self-talk strategies in combat sport. The few studies targeted taekwondo (Slimani & Cheour, 2016; Zetou et al., 2014b), kickboxing, and karate (Slimani & Cheour, 2016). No documented self-talk study, descriptive or experimental has targeted the sport of boxing.

### **The Sport of Boxing**

Boxing is among popular sports, evidenced by a presence in major international competitions (e.g., Commonwealth and Olympics Games). Boxing's distinctiveness from other martial arts sports is documented. For instance, a panel of eight sports experts ranked boxing as the most difficult out of 60 sports, with martial arts coming 6th (ESPN, 2010). The panel, which comprised muscle and movement academics, sports journalists, and athletes, gauged each sport's demands on 10 athleticism categories: endurance, strength, power, speed, agility, flexibility, hand-eye coordination, nerve, durability, and analytic aptitude. Boxing scored the highest of all sports on endurance, power, nerve, and durability (ESPN, 2010). Total Sportek (2016) also reported boxing as the most difficult of 25 sports. Self-talk research targeting boxers is thus a worthy endeavour with potential to enrich comprehension of

athletes' self-talk use. Investigating self-talk usefulness in uncontrolled boxing settings can inform practice.

## **1.2 The Thesis**

This thesis is empirical and novel in several ways. Study two through five investigated self-talk use in the sport of boxing, a sport self-talk research in general and in interventions, have not targeted. The thesis targeted a population not engaged before, Batswana athletes (or in general). Further, the thesis used mixed methods sequentially as means to an end rather than an end in themselves. The same participating boxers therefore, took part in studies two through five. Study two (retrospective recall interviews) provided insights on the boxers' self-talk use, awareness, and beliefs. This paved the way for study three, a real time (think aloud) exploration of participating boxers self-talk, and comparison with retrospective recall findings. Here in, the TA approach was used to capture self-talk and use the findings to inform an envisioned self-talk intervention (not used before), rather than for purposes of decision making analysis as the method is commonly used in sport. Moreover, retrospective findings, which suggested several personal and situational self-talk antecedents informed study four (video assisted interviews), which scrutinised the boxers' perceived role of coaching behaviour on their self-talk use, during competition. Finally, an experimental study was implemented for participating boxers, informed by preceding studies, an intervention study conducted in performance (actual training) and competitive (national championship) settings, a rare endeavour considering the few performance and competitive settings noted in current trends, despite self-talk interventions research spanning almost four decades.

The thesis' systematic collection of self-talk studies on Batswana boxing athletes was informed by gaps identified in existing literature. For instance, self-talk had not been conducted among Batswana boxers necessitating a thorough understanding of self-talk use

among the population ahead of the envisioned intervention. Exploring participants' self-talk utilising retrospective interviews and the think aloud would give a detailed assessment and therefore a better understanding of Batswana boxers' self-talk use and needs. Such insights coupled with understanding potential complexities in self-talk intervention design, context, and implementation would be useful when planning tailored self-talk interventions for the participants. Furthermore, the systematic collection of self-talk studies would provide a clearer understanding about useful processes researchers and practitioners could incorporate when planning and delivering self-talk interventions.

### **1.3 Organisation of the Thesis**

Limitations stated above and boxing's uniqueness heightened curiosity, resulting in the endeavour to investigate self-talk use among Batswana boxers. A comprehensive review of the self-talk literature will precede a systematic review of trends in self-talk research to date before the project focuses attention on Batswana boxers' self-talk use. Chapter two (Literature Review) will thus focus on self-talk frameworks, general research developments, and experimental research trends. Research aims and questions will conclude the chapter. Chapter three (Systematic Review) will provide an analysis of current self-talk trends and highlight complexity issues in interventions. Thereafter the study will answer questions relating to five broad aims. Thus, chapter three will present an exploration Batswana boxing athletes' self-talk use, awareness, and beliefs using retrospective recall interviews. Chapter four will follow up on the preceding chapter findings and investigate Batswana boxers' self-talk in real time. Findings of the study will be presented and where fitting comparisons made. Chapter five will explore the boxers' perceived coaching behaviour influences on their self-talk, a follow up to chapter four (retrospective recall study) findings. Findings of all preceding three studies will be considered in the final study. Chapter seven will present an investigation of the effectiveness of a tailored skill-targeted self-talk intervention among

participating Botswana boxers in training and competition settings. Lastly, Chapter 8 will be a synthesis of the dissertation.

### ***1.3.1 Ethical Approval***

All studies in the review needing ethical clearance (studies two to five) received ethical clearance from Botswana's Ministry of Youth, Sports, and Culture (MYSC) following recommendation from the University of Botswana (UB)'s Research Ethics Office of Research and Development:

MYSC 9/2/1 VII (4)

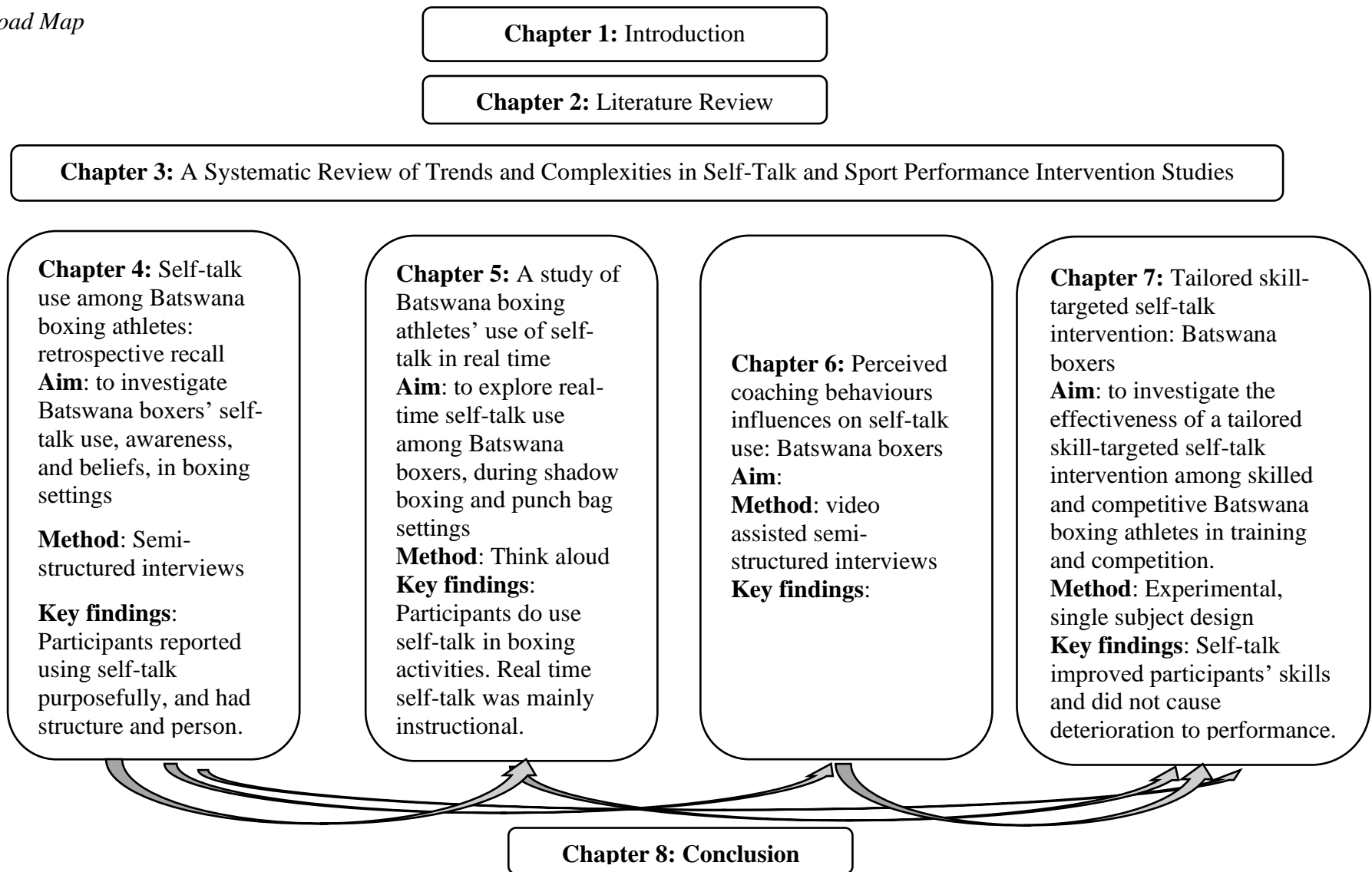
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### ***1.3.2 Thesis Road Map, Participation Flow Chart, and Timeline***

For the readers' benefit, a thesis study map follows to provide an overview of distinct studies and their place in the thesis. The map (Fig. 1) while indicating all chapters, outlines aims, objectives, methods, and key findings for studies two to five. As well, a participation flow chart (Fig 2) is included for the reader's benefit, to easily follow participation at distinct phases of the thesis. In addition, a timeline depicting phases of distinct studies shown in Figure 3.

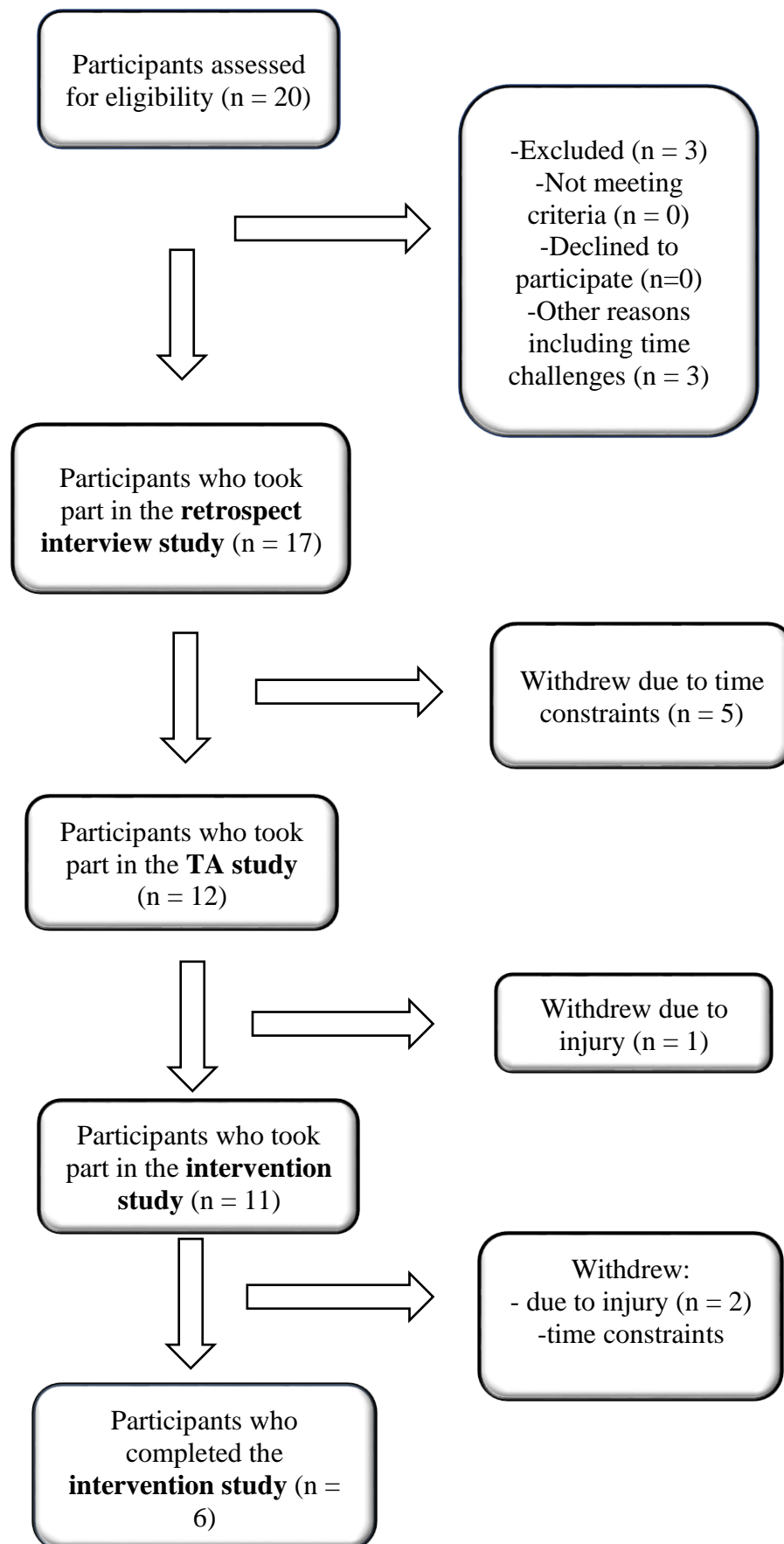
**Figure 1**

*Thesis Road Map*



**Figure 2**

*Participation flow chart*



**Figure 3**

*Timeline of Distinct Studies*



STUDY	ACTIVITY	2016	2017				2018				2019				2020		2021					2022
		Oct - Dec	Jan - Mar	Jun	Jul - Sept	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sept	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sept	Oct - Dec	Feb - Nov	Jan & Dec	Jan/Feb	Mar	Apr - Jun	Jul - Sept	Oct - Dec	Feb - Mar
Study 1	Data Collection, Data updates, report, reviews																					
Study 2	Interviews																					
	Transcription, Preliminary analysis																					
	Analysis, report, dissemination, reviews																					
Study 3	Recordings, Transcription, Preliminary analysis																					
	Analysis, report, dissemination, reviews																					
Study 4	Recordings, interviews, transcription, Preliminary analysis																					
	Analysis, report, reviews																					
Study 5	Pre-test, pre-test analysis																					
	Intervention, post-test																					
	Analysis, report, reviews																					

## **CHAPTER 2**

### **The Literature Review of Self-Talk Use in Sport**

Over the past four decades, self-talk and sport performance literature has grown considerably (e.g., DeWolfe et al., 2020; de Matos et al., 2020; Hatzigeorgiadis et al., 2011) and by this means facilitated review studies (e.g. Tod et al., 2015; Tod et al., 2011). Additionally, increased documented self-talk/performance literature paved the way for the development of frameworks that may: 1) enhance our current understanding of the relationship between self-talk and sport performance, 2) direct future research on the subject, and 3) guide practitioners in serving “the needs of individual athletes, teams, coaches, and sports organisations in varied contexts.” (e.g., Hardy et al., 2009; Van Raalte et al., 2016; p. 146). Specifically, a framework for the study of self-talk in sport (Hardy et al., 2009) and a sport-specific model (Van Raalte et al., 2016) have been presented based on descriptive (qualitative and quantitative) and experimental studies current at the time.

This chapter will highlight two self-talk frameworks pertaining to self-talk in sport. In addition, the chapter will discuss trends in self-talk and sport research. Trends discussed will encompass research approaches, targeted task goals, type of self-talk explored, participants’ skill level, and intervention variables. Thereafter the chapter will specify gaps in the literature and conclude with dissertation aims.

#### **2.1 Frameworks in Self-Talk Research**

Research on self-talk use in sport enabled the development of frameworks that may: (a) enhance current understanding of the self-talk and performance relationship, (b) direct future research on the subject, and (c) guide practitioners in serving stakeholders’ needs (Hardy et al., 2009; Van Raalte et al., 2016). Two frameworks fit the current study, Hardy and associates’ (2009) framework for the study and application of self-talk in sport, and Van

Raalte and colleagues' (2016) sport-specific model. This section will present each model, concluding with a comparison of the models.

### ***2.1.1 Framework for the Study of Self-Talk in Sport***

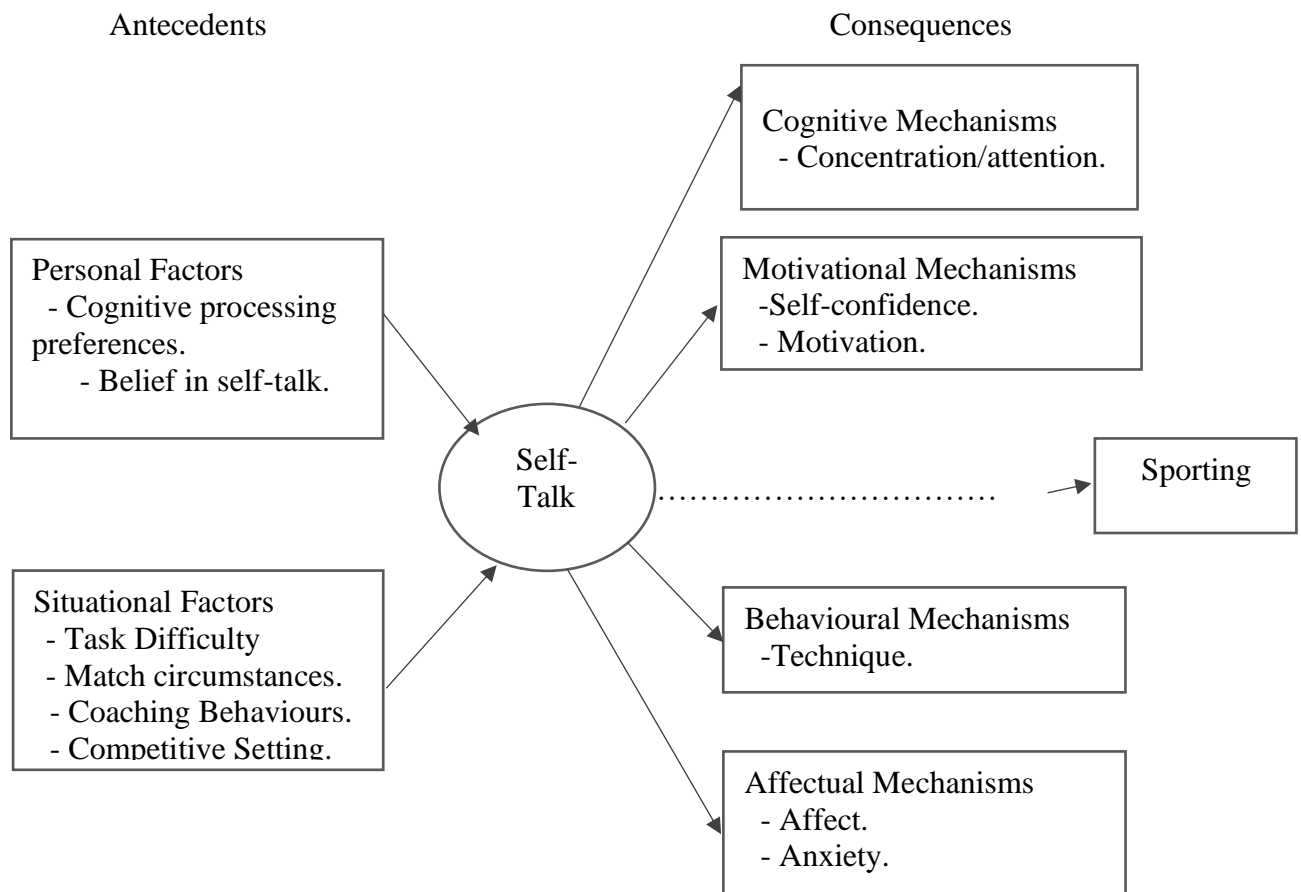
Hardy and colleagues (2009) proposed a self-talk research framework from a perspective which depicts self-talk to be distinct from other cognitive processes such as imagery and daydreaming. This perspective considers self-talk as conscious and therefore emphasises athletes' deliberate sport-specific thoughts rather than thoughts in general. The authors, therefore, view self-talk as self-oriented statements athletes use to guide their sport-oriented thinking (Hardy, 2006). Moreover, the Hardy and associates (2009) framework depicts self-talk as multi-dimensional since it entails frequency of use, overtness, valence, motivational interpretation, and function. Frequency relates to incidence of athletes' self-talk use. Overtness pertains to athletes' self-talk being audible or inaudible. Valence concerns athletes' self-talk content being of a positive or negative tone. The motivational interpretation dimension speaks to the meaning athletes attach to their self-talk (motivating or demotivating). The function aspect relates to reasons athletes employ self-talk, to self-instruct and/or self-motivate (Hardy, 2006).

The two self-talk functions (instructional and motivational) have been categorised into more precise reasons why athletes use self-talk (Hardy et al., 2001a). The instructional function consists of self-talk that is cognitive-specific or general to task. Cognitive-specific self-talk helps athletes acquire and carry out specific skills (e.g., throwing an uppercut). Cognitive-general self-talk on the other hand assists athletes to concentrate on the whole performance (e.g., increasing work rate) and implementing the game plan (e.g., keeping to the right). Hardy and colleagues' (2009) framework further presents that the motivational function of self-talk comprises motivational-mastery, motivational-arousal, and motivational-

drive functions. The motivational-mastery function is associated with mental hardiness, concentration, self-assurance, and mental readiness skills necessary to effectively prevail over situations. Motivational-arousal function on the other enables athletes to attain a relaxed state, ready themselves for action (“psych” themselves up), and regulate levels of their stimulation. The motivational drive function unlike the other two functions is general and associated with enabling athletes to persist in attaining their objectives. Motivational drive is therefore, linked with sustaining or heightening motivation levels and attempts made (Hardy et al., 2001a). Figure 4 depicts Hardy et al.’s (2009) framework.

**Figure 4**

*Framework for the study of self-talk in sport*



(Hardy, Oliver & Tod, 2009).

Hardy and associates' (2009) framework further depicts two categories of possible self-talk precursors, being the individual and situational level factors. Additionally, the authors suggest that self-talk enhances performance via four mechanisms namely, cognitive, motivational, behavioural, and affective mechanisms. The next section discusses proposed self-talk antecedents and underpinning mechanisms in relation to research at the time and at present.

**Antecedents of Self-Talk.** At the conception of Hardy et al.'s framework, compared to studies on the effect of self-talk on sport performance, research examining self-talk precursors remained scarce (e.g., Hardy, 2006, Van Raalte et al., 2000). Possibly, the lack of a guiding self-talk framework hampered investigations of self-talk antecedents (Hardy, 2006; Hardy et al., 2009). Notwithstanding the limited research on self-talk precursors, Hardy and colleagues (2009) proposed two self-talk antecedents, which shape and influence athletes' self-talk.

**Personal Antecedents.** Drawing from early research (e.g., Araki et al., 2006; Conroy & Metzler, 2004; Thomas & Fogarty, 1997), Hardy and colleagues (2009) proposed three broad personal precursors to athletes' self-talk: cognitive processing preference, belief in self-talk, and personality traits. Despite limited sport context research showing individual preferences in processing cognitive information, the authors considered the influence of individual preference to athletes' overt or covert self-talk. For instance, athletes with a strong preference for verbal processing of cognitive information may use overt self-talk more than athletes who prefer non-verbal processing (Hardy et al., 2009). Evidence of the association between cognitive processing preference and self-talk remains limited. Still, the suggestion points to the likely need for self-talk interventions tailored to individuals' cognitive processing preferences.

Aside from cognitive processing preference, Hardy and associates (2009) suggested that belief in self-talk is a precursor to self-talk use. The assertion stemmed from both sport (e.g., Araki et al., 2006; Van Raalte et al., 1994) and non-sport studies (Oikawa, 2004) on the subject. The view is that one's belief or expectation about the usefulness of an intervention heightens the likelihood of the ensuing intervention's success (Oikawa, 2004). Early sport context studies suggested that belief in self-talk during tasks such as a balance beam (Araki et

al., 2006), tennis (Van Raalte et al., 1994), and badminton (Theodorakis et al., 2000) may have a role in the intervention. Findings pointed to a possible association between athletes' belief in self-talk's helpfulness and the ensuing performance outcome. For example, athletes who believed performed better than non-believers (Araki et al., 2006; Theodorakis et al., 2000; Van Raalte et al., 1994). Further research on the subject is warranted.

Although at the time links between personality traits and self-talk were unclear, Hardy and associates (2009) suggested that general personality attributes (e.g., anxiety traits) may be associated with athletes' self-talk use. For instance, inferences had been made that negative self-talk displayed by an athlete may stem from the athlete's negative self-view (Perry & Marsh, 2000) or trait-anxiety (Conroy & Metzler, 2004). In fact, the latter found a strong relationship between self-talk and both fear of failure and sport anxiety. In addition, findings showed a mild relationship between self-talk and fear of success. The results revealed that elevation in negative self-talk correlated with heightened fear of failure, and elevation in positive self-talk correlated with reduced fear of failure (Conroy & Metzler, 2004). A more recent study (Kanniyan, 2015) corroborated early suggestions linking self-talk to personality attributes. The experimental study found reduction in competitive anxiety (cognitive and somatic) following a positive self-talk intervention. Considering the link documented between cognitive anxiety and underperformance, (e.g., Burton, 1988), evidence for the benefits of self-talk on lowering competitive anxiety is encouraging (e.g., Burton, 1988).

Hardy and colleagues' (2009) proposed personal antecedents are generally derived from descriptive research findings, lacking causation evidence. Although some recent studies yielded evidence for a causal link between self-talk and cognitive anxiety (e.g., Kanniyan, 2015), such studies are too few to generate conclusions. Consequently, further research on the

subject is needed to test proposed associations and demonstrate causation (Hardy et al., 2009).

***Situational Antecedents.*** Besides personal factors' influence on athletes' self-talk use, Hardy and associates' (2009) proposed the role of situational factors on athletes' subsequent self-talk. A case for four broad situational antecedents was made drawing from early research: task difficulty (e.g., Behrend et al., 1989), match circumstance (e.g., Van Raalte et al., 2000), significant others (e.g., Zourbanos et al., 2006), and competitive setting (e.g., Hardy et al, 2005).

Drawing from conventional psychology research Hardy and colleagues (2009) pointed to an association between task difficulty and private speech (e.g., audible self-talk) observed mostly on moderate difficulty activities (Ferneyhough & Fradley, 2005). Early research suggested that self-talk primarily helps individuals to attain self-control (e.g., Vygotsky, 1962; Ferneyhough & Fradley, 2005), implying the utility of self-talk to manage challenging tasks for which the individual has strategies to use to gain control. Moreover, the inference is that individuals are less likely to use self-talk when performing tasks whose demands outweigh strategies at hand (Hardy et al., 2009). Research examining the suggested link between self-talk use and task difficulty is yet to be established, with experimental studies having focused on the effects of self-talk on task performance in general (e.g., Hatzigeorgiadis et al., 2011). Many of these studies employed athletes of varying skill, characteristics, and experience level (e.g., novices and skilled athletes), which likely coincide with task novelty. The studies, however, did not specifically investigate the use of self-talk in managing task difficulty. This gap necessitates the need for future research to investigate the proposed association between self-talk and task difficulty, and the impact of task difficulty on self-talk content (Hardy et al., 2009).



Hardy and associates (2009) further proposed that match circumstance plays a role on athletes' self-talk. The proposition was founded on studies, which suggested an association between (a) match situations and ensuing valence of the self-talk (Van Raalte et al., 2000), (b) match circumstance and frequency of a given valence of the self-talk (Conroy & Metzler, 2004), and (c) the importance of games and frequency of self-talk use (Hardy et al., 2001a). Specifically, early studies found match situations such as tennis point results and serving standing to predict negative self-talk usage (e.g., Van Raalte et al., 1994, Van Raalte et al., 2000). Noteworthy is that both studies examined observable self-talk or gestures, and that although match circumstance predicted both positive and instructional self-talk in the latter study, this was the case only for some tennis athletes (Van Raalte et al., 2000). Consequently, whether the researchers' interpretations of observed behaviour and ensuing self-talk categorisations accurately represented athletes' self-instructions remained uncertain. Moreover, an early study (Hardy et al., 2001) which hinted to the influence of match importance on self-talk, was based on self-reports, thus not demonstrating a causal relationship between match circumstances, and ensuing self-talk. More research is needed to demonstrate causation.

Initial, education research using pre-school children (e.g., Behrend et al., 1989) and students (e.g., Burnett, 1999) informed Hardy and colleagues' submission that the presence and actions of individuals who interact with athletes may precede the latter's self-talk use. Hardy and associates (2009) acknowledged suggestions that self-talk is learnt from the speech of those one interacts with (e.g., Burnett, 1999; Lantolf, 2006), in similar ways that actions are observed and learnt from social settings (Bandura 1977; 1982). Coaches, teammates, and opponents are therefore, considered possible significant other influences. Sporting time of athletes is mostly spent in training and competition with coaches and teammates.

Early research suggesting coaching influences included reports that coaches foster athletes' positive self-talk and that coaches considered self-talk to be useful in boosting athletes' confidence (Weinburg et al., 1992). In addition, the results suggested a link between athletes' reasons for self-talk use and coaches' motives for promoting self-talk use. However, no association between athletes' perceptions of coaches' self-talk promotion and the athletes' self-talk prevalence was found (Hardy and Hall, 2006). Other early findings suggested an association between coaches' actions and athletes' self-talk valence. For example, Zourbanos and colleagues (2006) found a positive link between coaches' negative actions and (a) athletes' negative self-talk, and (b) athletes' thoughts of underperforming. In a later study, (Zourbanos et al., 2007) findings showed that coaches' supportive behaviours such as the use of positive statements seemed to heighten chances of athletes employing positive self-talk, and vice versa. Notwithstanding mixed findings noted in early research, Hardy and colleagues (Hardy et al., 2009) submitted that coaches influence athletes' self-talk use. Studies on the subject remain wanting, limiting our understanding of coaching behaviours' influence on athletes' self-talk.

Although not as researched as coaching behaviours, Hardy and associates (2009) highlighted teammates' influence on athletes' self-talk. Informed by Bandura's (1977; 1982) social learning theory, Hardy and colleagues (2009) suggested that observation and learning may occur between teammates. For example, when observing an admired teammate perform a strategy such as self-talk, individual athletes may replicate the observed tactic. In fact, research reported the influence of modelling self-talk on performance with indications that modelling positive self-talk use yielded better performance compared to modelling negative or irrelevant self-talk (Gould & Weiss, 1981). Although the study did not measure the impact of positive self-talk on performance, Hardy and associates (2009) welcomed the suggestion that participants may have embraced the modelled self-talk strategy. Hardy and colleagues

(2005a) reported a more direct association between teammates' influence and athletes' self-talk. The study indicated elevated use of self-talk among individual than team sport athletes across sports settings (e.g., during and before competition, and training). The authors explained this finding as possibly because individual sport athletes are distinguishable and easily appraised compared to team sport athletes. Individual athletes, therefore, likely use self-talk more for instructional purposes and focus. However, research on teammates' influence on individuals' self-talk remains limited thus evidence on the association is yet to be established. Little remains known about whether athletes use self-talk because of learning from teammates, and the suggested differences in self-talk use between individual (e.g., boxers and judo) and team (e.g., netball and volleyball) sport athletes.

Although also understudied, Hardy and colleagues (2009) suggested the possible influence of opponents on athletes' self-talk use. The proposition for opponents' influence is based on few studies (e.g., Hardy et al., 2005a; Van Raalte et al., 2006) that hinted to the likelihood that opponents are precursors to athletes' self-talk use. Cited research found elevated use of self-talk during competition than training among athletes, suggesting that competition environments, which include opponents, influence self-talk use (Hardy et al., 2005a). The association is, however, assumed based on elevated self-talk use in competition. Investigations testing the assumption are paramount to enable conclusive assertions. Hardy and colleagues (2009) have shown the basis for the proposed situational self-talk antecedents. However, everything considered, research is yet to test and establish evidence for the influence of stated antecedents. Even so, early research presented herein did enough to point to the likely influence of situational factors on athletes' self-talk. Hardy et al. (2009) thus concluded that even if athletes' self-talk content may not plainly reflect the setting, situational variables have potential to influence self-talk content and prevalence, thereby impacting on performance. The authors note the need for further research to uncover added self-talk

precursors and to investigate possible interactions between individual and situational antecedents (Hardy et al., 2009).

**Self-Talk and Performance.** The framework for the study of self-talk is centred on the relationship between self-talk and sport performance demonstrated in numerous studies (e.g., Goudas et al., 2006; Edwards et al., 2008; Theodorakis et al., 2000). Drawing from qualitative (e.g., Araki et al., 2006; Gammage et al., 2001), quantitative (e.g., Hardy et al., 2005b; Zervas et al., 2007), and experimental research designs (e.g., Peluso et al., 2005; Theodorakis et al., 2001), Hardy and colleagues (2009) highlighted the significance of the self-talk and performance relationship. This section presents a summary of descriptive and experimental research, upon which the framework of the study of self-talk is based. The section will conclude with limitations of research at the time and derived implications.

**Descriptive Research.** Early descriptive studies pointed to athletes' self-talk use (e.g., Hardy et al., 2001, Hardy et al., 2004) and suggested a relationship between self-talk and sport performance (e.g., Van Raalte et al., 1994). Some early research hinted to a relationship between negative self-talk and losing and between believing in self-talk use and winning (Van Raalte et al., 1994). Other studies suggested that match circumstance (e.g., tennis points result) influenced self-talk valence and functions (Van Raalte et al., 2000) while task-relevant thoughts benefitted competition performance more than irrelevant thought (Highlen & Bennet, 1983). As useful as these studies were, Hardy and associates (2009) acknowledged limitations thereof, including ambiguity of findings and variations in both self-talk descriptions and measures. Furthermore, although recognising the complimentary contribution of quantitative studies (e.g., Zourbanos et al., 2009; Zervas et al., 2007), Hardy et al. (2009) underlined limitations thereof. For instance, quantitative research cannot hypothesise about the impact of self-talk on performance. Accordingly, experimental research was considered more pivotal than descriptive studies because it can give causation evidence

regarding the relationship between self-talk and performance, mediators, and moderators (Hardy et al., 2009).

***Experimental Research.*** Hardy and associates (2009) acknowledged suggestions that multi-intervention packages have beneficial impact on skill execution and psychological states. Even so, Hardy and colleagues (2009) underscored findings from purely self-talk interventions because such provided direct evidence regarding the usefulness of self-talk on performance. Cited research investigated the influence of self-talk on precision-based tasks like darts throwing (e.g., Marciana et al., 2001), soccer shooting (e.g., Papaioannou et al., 2004), basketball shooting (e.g., Theodorakis et al., 2001), and swimming (e.g., Rushall & Shewchuk, 1989). Few investigations focused on endurance-based tasks such as sit-ups (e.g., Theodorakis et al., 2000; Study 3) and triathlon gymnasium (e.g., Theodorakis et al., 2000). Hardy and colleagues (2009) pointed to the need for investigations on self-talk interventions to also target skills that require power (e.g. tackling in rugby), creative skills (e.g. gymnastics floor routine), and team interaction (e.g. scrimmaging in rugby union).

Early studies highlighted four types of self-talk: instructional, motivational, positive, and negative self-talk, with research mostly focused on instructional self-talk (e.g., Papaioannou et al., 2004; Malouff & Murphy, 2006). Studies which compared instructional self-talk with control conditions revealed a superior impact of instructional self-talk on tasks such as basketball (e.g., Theodorakis et al., 2001), badminton (e.g., Theodorakis et al., 2000; Study 2), soccer (e.g., Theodorakis et al., 2000; Study 1), and tennis (e.g., Cutton & Landin, 2007). Early efforts to understand the influence of instructional and motivational self-talk on task performance included Theodorakis and associates' (2000) matching hypothesis. The matching hypothesis suggested that instructional self-talk would have superior effects on skills that demand precision and timing compared to motivational self-talk. Motivational self-

talk on the other hand would have greater effect on tasks that demand strength or endurance compared to instructional self-talk (Theodorakis et al., 2000).

Support for the matching hypothesis has been reported in later studies pointing to superior benefits of instructional self-talk on novel tasks - learning and training environments while motivational self-talk was reported to have superior benefits in learned tasks - during performance and competitive settings (e.g., Galanis et al., 2016; Hatzigeorgiadis et al., 2014; Hatzigeorgiadis et al., 2016) Zourbanos et al., 2013). Based on suggested matching hypotheses, self-talk possibly serves different purposes depending on task demands and/or context. Consequently, when formulating effective self-talk strategies, practitioners and investigators need to take into account the task at hand, individuals' preferences, and the situational requirements. (Galanis et al., 2016). Still, research, which provide cause and effect evidence (e.g., Zourbanos et al., 2013) is limited. Also, investigations have employed instructional self-talk more than motivational self-talk and targeted fine motor tasks more than gross motor tasks (Hatzigeorgiadis et al., 2011), limiting balanced insights on the matching hypothesis.

Although early research heavily concentrated on self-talk functions (e.g., Theodorakis et al., 2000), some studies indicated that positive self-talk augmented skill level and performance in skills accuracy in golf shooting (Harvey et al., 2002) and dart throwing (Marciana et al., 2001) compared to control conditions. Ambiguous findings have however been noted when comparing positive self-talk and negative self -talk on novel dart throw (Van Raalte et al., 1995) and learned golf putting (Harvey et al., 2002). Although the former study (Van Raalte et al., 1995) found benefits of positive self-talk over negative self-talk, on performance, the latter (Harvey et al., 2002) found that both positive and negative self-talk positively correlate with reduced accuracy. Elucidating on reported inconsistent findings, Hardy et al. (2009) suggested a couple of possibilities: (a) individual differences in

participants' interpretation of the self-talk content, and (b) the helpfulness or unhelpfulness of positive or negative statements on performance may differ from person to person. To date, though, documented self-talk valence oriented studies remain limited (e.g., Ay et al., 2013) compared to research on self-talk functions (e.g., Abdoli et al., 2018; de Matos et al., 2020).

Although many studies Hardy and colleagues (2009) cited employed experimental processes such as manipulation checks, control conditions, random allocation into groups, and counterbalanced interventions (e.g., Edwards et al., 2008; Hatzigeorgiadis et al., 2004; Johnson et al., 2004; Perkos et al., 2002), the authors acknowledged associated limitations. First, individual differences may have confounding effects on the findings. Individual differences comprise, (1) athletes' self-talk content, (2) the use of other self-talk cues instead of the assigned, (3) covert use of self-talk when instructed to overtly self-instruct, and (4) the use of self-talk in control groups. Second, purity of intervention processes (e.g., cue selection and giving cues during tasks) may be compromised in instances where researchers suggest self-talk cues, give cue examples during selection, and provide cues during task execution, the latter adding the verbal encouragement variable (Hardy et al., 2009). Third, in many instances manipulation checks focus on the frequency of self-talk use during task performance, neglecting to ascertain the use of other cues besides the assigned. The fourth limitation pertain to limited generalisability because of; (1) the narrow scope of tasks explored, (2) the use of mostly students or novice athletes, which limits self-talk efficacy generalisability to athletes of varying experience and skill level, and (3) mostly using settings other than competition thus limiting generalisability of findings to competitive settings. Lastly, studies have given evidence in support of the benefits of self-talk on specific performance (e.g., technique mastery, accuracy), but evidence in answer questions pertaining to self-talk usefulness on overall performance remains limited (Hardy et al., 2009).

Based on stated limitation, Hardy and associates (2009) highlighted four implications for self-talk interventions. First, individual differences and therefore personal preferences limitations point to the need for rigour during manipulation check process. It is necessary for manipulation check to establish: (1) actual self-talk athletes used besides the intervention assigned or selected cues, (2) covertness of self-talk used despite intervention instructions on covert or overt use, and (3) athletes' interpretation and meaning ascribed to self-talk used. Second, to address generalisation concerns, self-talk interventions need to; (1) widen the scope of sport tasks studied, (2) target athletes of varying experience and skill level other than students and novices, and (3) expand the scope of contexts to include competition and actual training settings. Third, competitive performance demands holistic performance, requiring athletes to have refined techniques, tactics, and mental skills. For instance, to improve chances of good overall performance a boxing athlete needs to apply themselves in offense, defence, and tactical skills. Interventions therefore need to target overall performance.

Fourth, to minimise impurities during interventions, rather than providing a list of cues or giving cue examples to guide athletes, practitioners could establish self-talk athletes usually use for specific tasks, general performance, and meanings athletes ascribe to reported self-talk – a self-talk needs assessment. The self-talk needs assessment would enlighten practitioners about individual preferences and needs, facilitating tailored self-talk interventions (Hardy et al., 2019). Besides, the process would ensure engagement of intervention recipients at the formulation stage with the possibility of enhancing chances of intervention success. Where practitioners' understanding of individual preferences and needs is heightened, their guiding and helping athletes to refine self-talk cues may yield less impurities. Moreover, involvement of athletes during intervention formulation is likely to result in athletes stating preferred cues, thereby minimising the need to assign cues during intervention. Further, the need for verbally encouragement to use self-talk during task



execution may be reduced if not eliminated, lessening intervention impurities. The four implications discussed point to the need for tailored self-talk interventions, which is a goal of the present study.

**Underpinning Mechanisms.** Hardy and associates (2009) highlighted four mechanisms, which possibly explain the self-talk and performance relationship, namely, cognitive, motivational, behavioural, and affective mechanisms. The likelihood that stated underpinning mechanisms may be working together rather than separately is acknowledged (Hardy et al., 2009).

**Cognitive Mechanisms.** Cognitive mechanisms herein encompass “information processing, concentration, attention control, and attentional styles” (Hardy et al., 2009, p. 51). Early studies pointed to the usefulness of self-talk in augmenting athletes’ focus levels, and the possibility that attention mediates the self-talk and performance relationship (e.g., Hatzigeorgiadis et al, 2004; Landin, 1994; Landin & Herbert, 1999). Early research indicated that athletes viewed positive self-talk as beneficial to their focus (Van Raalte et al., 1994) and used self-talk to augment focus (e.g., Goudas et al., 2006; Perkos et al., 2002; Hardy et al., 2001a; Hardy et al., 2005a;). Later studies also suggested the association between self-talk and sustained focus, with athletes reporting the usefulness of self-talk to their focus (e.g., Cutton & Hearon, 2014; Miles & Neil, 2013). More recent studies have also reported support for the impact of self-talk in attention (Galanis et al., 2016) with evidence found that self-talk possibly improves performance through its beneficial effects on athletes’ concentration (Galanis et al., 2018).

Although early studies cited informed Hardy and associates’ (2009) proposed mediating role of focus, the authors acknowledged that given the absence of a focus measure, the studies did not demonstrate improvements in athletes’ concentration. Studies, which

measured participants' concentration reported reduced intrusive thoughts incidence and improved focus during task execution in self-talk experimental groups compared to control group (Hatzigeorgiadis et al., 2004; Hatzigeorgiadis et al., 2007). Notwithstanding, Hardy and associates (2009) highlighted issues regarding said studies' measure of focus. For instance, reduction in intrusive thoughts does not necessarily equate to improved focus. Moreover, measuring intrusive thoughts to assess concentration does not gauge features relevant to focusing on task pertinent stimuli (Hardy et al., 1996). For example, an athlete may concentrate on general defence and not on the speed of an incoming punch (task relevant stimuli). Yet, athletes need to fully sustain, sharpen, and modify attentional focus during sporting activities where circumstances may changing. Variances in circumstances during training or competition demands athletes' ability to switch attention from one stimuli to another, including switching to relevant stimuli (Hardy et al., 2009; Ziegler, 1987).

Research on task pertinent focus found that athletes' use of self-talk augmented such focus in sport such as water-polo (Hatzigeorgiadis et al., 2004), football (Johnson et al., 2004), and tennis (Landin & Hebert, 1999). The findings suggested self-talk's potential in helping athletes know how to and on what to direct their focus during task execution (e.g., Hardy, 2006; Landin, 1994; Perkos et al., 2002). Also, findings indicated beneficial effects of self-talk via attentional focus irrespective of self-talk being motivational or instructional (e.g., Hatzigeorgiadis et al., 2006; Hatzigeorgiadis et al., 2004; Miles & Neil, 2013). Hardy (2006) suggested that instructional self-talk was more suited to attentional concentration. Hardy and colleagues (2009) however, noted the possibility that ambiguity in how focus was described may explain inconsistent findings. Recent studies have reported evidence in support of the mediating role of attentional focus in the relationship between self-talk and task execution (Wright et al., 2016; Zetou et al., 2014). For instance, Zetou and colleagues (2014) reported beneficial effects of instructional self-talk on attentional focus. Still, continued research

incorporating diverse attention measures is recommended to enable thorough examinations of performers' focus of attention (Hardy et al.' 2009).

***Motivational Mechanisms.*** Hardy and associates (2009) noted the association between motivational variables and skill execution in sport (e.g., Scully & Lowry, 2002), education (Shui-Fong and Yin-Kum, 2007), and business (Day & Allen, 2004). Proposition for motivational mechanisms' mediating role between self-talk and performance was based on research reporting athletes' use of self-talk for motivation purposes (e.g., Goudas et al., 2006; Hardy et al., 2001a). Hardy and colleagues' (2009) framework proposed two motivational variables, self-efficacy and persistence.

Self-efficacy has been depicted as a motivational factor due to its impact in the build-up to and during task execution (Lane, Jones and Stevens, 2002). Hardy et al. (2009) described self-efficacy as self-confidence specific to the circumstance. The proposition that self-efficacy is a likely motivational mechanism is based on the reported relationship between self-efficacy and performance (Moritz et al., 2003), increased effort (Weinberg, 1986), positive emotion (Brown et al., 2005), and extended behavioural perseverance (McAuley et al., 2007). Also, cross-cultural research found that positive self-talk was endorsed as a useful technique, which augmented athletes' self-efficacy (Weinberg et al., 1992). Moreover, descriptive research findings pointed to the likely relationship between self-talk and self-efficacy. For example, performers reported the use of cognitive-oriented confidence-managements tactics (e.g., thought-stopping and positive valence) to evade interpretations of anxiety that were incapacitating (Hanton et al., 2004). In addition, correlational research found a positive association between self-talk valence and respondents' self-efficacy in a sit-up task (Hardy et al., 2005a).

Descriptive research's limitation in providing causation evidence necessitates experimental research findings. Causation evidence for self-talk and self-efficacy relationship was reported in a few early studies. For instance, a self-talk intervention enhanced self-efficacy in net volleying skill among skilled tennis athletes (Landin & Hebert, 1999). Hardy (2006) later suggested that self-talk is possibly a verbal persuasion that precedes and enhances self-efficacy. Hardy (2006) echoed Bandura's (1997) proposal that mastery experience, vicarious experience, emotional arousal, and verbal persuasion precede self-efficacy. Based on research at the time, Hardy and associates (2009) suggested that positive self-statements may enhance self-efficacy, effort, perseverance, and skill execution.

Yet Cumming and colleagues (2006) study found contrary findings. The study found improvement in skill execution following intervention, but not in self-efficacy. This suggested a relationship between intervention and performance, but not between the intervention and efficacy. The authors (Cumming, 2006) suggested that athletes' inexact and exaggerated judgements of self-efficacy at the beginning of the study may shed light on why the intervention seemed ineffective on self-efficacy. That said, the intervention combined self-talk and imagery, limiting suitability of the findings as evidence for the impact of self-talk on self-efficacy. Some later studies have supported the proposition that self-talk has an association with self-confidence (e.g., Ay et al., 2013; Wright et al., 2016; Zetou et al., 2014). Precisely, elevated self-efficacy (Ay et al., 2013; Wright et al., 2016) and self-confidence (Zetou et al., 2014) were linked to improved performance. Although Zetou and associates' (2014) study does not give insight on cause and effect, several studies (e.g., Ay et al., 2013; Walters et al., 2019; Wright et al. 2016)) have shown cause and effect evidence on the mediating role of self-efficacy on the self-talk and performance relationship.

The second motivation variable, persistence, otherwise referred to as "long term goal commitment" is also deemed a likely mediator in the self-talk and sport performance

relationship (Hardy et al., 2009, p. 56). Persistence is similar to Hardy and associates (2001a) drive function enabling the performer to stay focused on goals. Therefore, persistence is linked to sustaining or augmenting athletes' drive and task execution attempt (Hardy et al., (2009). At the time, research on the association between self-talk and behavioural components of motivation in sport contexts was limited. Yet, evidence in education contexts suggested a relationship between self-talk and both long- and short term drive among children (Chiu & Alexander, 2000; Harris, 1986; Manning et al., 1994) and high school students (Walters, 1999). Given the common prescription of motivational self-talk to enhance sporting performance, Hardy and colleagues (2009) considered exploration of the mediating role of motivation functions (e.g., persistence) between the self-talk and performance relationship necessary. Research is yet to test the proposed mediating role of persistence in the relationship between self-talk and task execution.

***Behavioural Mechanisms.*** The value placed on good technique is evidenced by time athletes spend refining technique, and research targeting skill execution (e.g., Hatzigeorgiadis et al., 2011). Hardy associates (2009) proposed that behaviour mediates the self-talk and sport performance relationship. Changes in body movement (kinaesthetic), for instance may facilitate the self-talk and performance relationship. Early research reported a link between self-talk and improvements in body movements during tasks such as tennis ball overhand throw (Anderson et al., 1999), tennis groundstroke (Landin & Hebert, 1999; Ziegler, 1987), tennis forehand (Cutton & Landin, 2007; Landin & Hebert, 1999), and tennis volleying (Landin & Hebert, 1999). Aforementioned studies however, employed subjective measures of body movement. Scant research utilising objective measures reported beneficial effects of both instructional and motivational self-talk on such tasks as knee hip movements (Edwards et al., 2008; Tod et al., 2009) and skill execution (e.g., Zetou et al., 2014a; 2014b). The need for further research to enhance understanding of the role body movement plays on the self-

talk and sport performance relationship cannot be understated, even over a decade since Hardy and associates recommended the same.

*Affective Mechanisms.* Informed by theories in wider psychology (e.g., Meichenbaum & Butler, 1979; Mischel & Shoda, 1995), Hardy and colleagues (2009) used the phrase “affective mechanism” as an all-encompassing term for affect, mood, and emotions. The proposition for affective mechanisms’ mediation role is founded in early research targeting the relationship between affective states and performance (e.g., Beedie et al., 2000; Woodman & Hardy, 2003). Support for the relationship between self-talk and affective states, especially anxiety had been noted in studies employing university students (Calvete et al., 2005), and children (Kendall & Treadwell, 2007). Based on similar findings, Hardy et al. (1996) proposed that self-talk regulates anxiety allowing performance to occur.

Early descriptive studies indicated that athletes reported using self-talk to help themselves relax, regulate their nerves, and to psych themselves up (Hardy et al., 2001a; Hardy et al., 2001b). Given the descriptive nature of aforementioned studies however, causality cannot be established (Hardy et al., 2009). At the time an experimental study employing the self-talk strategy to augment affective states reported self-talk’s beneficial effects on cognitive and somatic anxiety (Hatzigeorgiadis et al., 2007). A recent study (Walter et al., 2019) has reported the benefits of self-talk in reducing somatic stress anxiety. The studies, which showed causation, land evidence that that self-talk can improve affective states, and provide cause and effect. Given the association between sports anxiety and competition, and affective states’ potential to hamper athletes’ performance during competition (Hardy et al., 2009), further investigation of affective states’ mediation role on the self-talk and performance relationship is necessary.

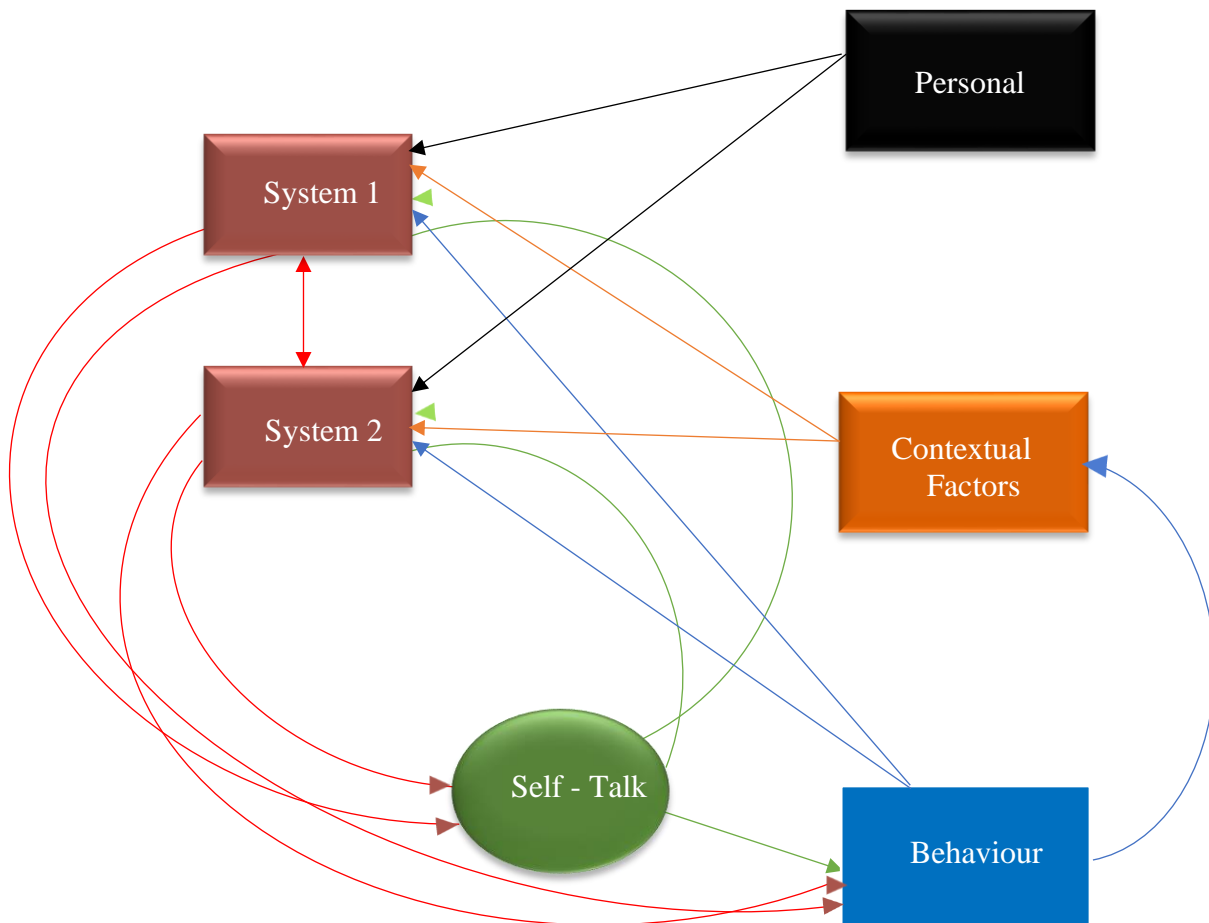
The framework bases its propositions on research which indicated the impact of self-talk on sport performance. Early qualitative and quantitative research provided a foundation for proposed moderating and mediating factors. The authors (Hardy et al., 2009) acknowledged the limitations and emphasised the need for further research testing proposed moderating and mediating variables. Few research have since provided initial evidence and more investigations are needed. Such will evidence a shift from focusing on whether self-talk affects performance to include ways self-talk impacts performance. Findings from such research may yield practical guidelines for practitioners and athletes (Hardy et al., 2009).

### ***2.1.2 The Sport Specific Model of Self-Talk***

More recently, Van Raalte and colleagues (2016) proposed a sport-specific model of self-talk whose definition takes into account the broad nature of inner speech and dual processing theory. Self-talk thus is defined as, “the syntactically recognisable articulation of an internal position that is expressed either internally or out loud where the messenger sender is also the intended receiver” (Van Raalte et al., 2016, p. 141). Their model focused on the interconnections between the model’s six constituents: (a) Self-talk; (b) System 1 processing; (c) System 2 processing; (d) behaviour; (e) personal factors; and (f) contextual factors. This section discusses Van Raalte and colleagues’ (2016) model, presented in Figure 5 below.

**Figure 5**

*Sport-specific model of self-talk*



The antecedents of self-talk, personal and contextual factors, are shown by the black and orange arrows connecting to System 1 and 2. The red arrows represent the connections between System 1, System 2, self-talk, and behaviour; and the reciprocal nature of the links are shown by green and blue arrows (Van Raalte et al., 2016).



**Self-Talk.** Like Hardy and associates (2009), Van Raalte and colleagues (2016) acknowledged self-talk functions, valence, and overtness (described under Hardy et al. 2009's framework and will be revisited when the two models are compared). That said, Van Raalte and colleagues (2016) recognised the grammatical form of self-talk investigated in contemporary psychology settings (Kroos et al., 2014). Regarding grammatical form, interrogative self-talk (e.g., Can I) was found to yield better task execution compared to self-talk phrased in future tense such as "I will" (Senay et al., 2010). Moreover, in situations demanding behaviour control and intentional self-direction the use of second person (e.g., you) or third person (e.g., we) yielded superior performance than first person (Zell et al., 2012). In addition, first person use has been found to have a negative relationship with performance and self-efficacy (Son et al., 2011).

Borrowing on dual process theories' fundamental viewpoint, which describe two different ways in which information can be processed to yield diverse outcomes, Van Raalte and associates (2016) use System 1 and System 2 terms in their self-talk model. System 1 is intuition and System 2 considered to be reasoning (Stanovich & West, 2000). Herein these terms will be used interchangeably: intuition and System 1, and reasoning and System 2. Van Raalte and colleagues' (2016) model depicts the interrelation between self-talk and information processed through intuition and reasoning.

**System 1.** System 1 information processing is an undemanding process that takes place without awareness (Kahneman, 2003; Stanovich & West, 2000). In Van Raalte and associates' words, system 1 is a process which is "automatic, fast, parallel, effortless, difficult to modify and occurs below the level of awareness via biases and heuristics" (Van Raalte et al., 2016, p. 143). System 1 is linked to concepts and therefore can be stimulated by language. The role of intuition processing in influencing self-talk is considered minor compared to the influence of reasoning processing. Even so, the role of intuition cannot be undermined

because when System 2 capacity is depleted System 1 processing becomes the key self-monitoring system (Evans & Frankish, 2009; Morf & Mischel, 2012). Moreover, even when System 2 processing is fully operational mentally taxing tasks can diminish the role thereof yielding regulation to System 1 processing. When system 1 processing is the main self-regulating system subsequent self-talk is reactive rather than thought through (Kahneman, 2003).

Van Raalte and colleagues (2016) suggested the likely role of System 1 processing in negative self-talk and the potential usefulness thereof in explaining valence of athletes' self-talk. The proposition was based on early research, which suggested a possible association between negative self-talk and losing a point for instance (e.g., Van Raalte et al., 1994; Van Raalte et al., 2000). Given that negative self-talk seems spontaneous, and emotion fuelled in nature, Van Raalte and associates (2016) suggested that it is linked to System 1 impressions and resultant self-talk, which is reactive and slow to respond to reason and fresh information (Kahneman, 2003). Accordingly, then, negative self-talk is considered to be challenging for performers to regulate. For example, a highly skilled boxer may have difficulties altering their self-talk when losing a bout to an opponent of lower skills. Considering that positive self-talk can at times be spontaneous and emotion charged, positive self-talk can also be difficult to modify. For instance, athletes can have difficulties modifying their positive self-talk during extreme celebrations when the athlete or teammate scores a decisive goal in an important game (Van Raalte et al., 2016). Yet, given that research is yet to measure System 1 processing, its link to self-talk in general has not been established. Van Raalte and colleagues (2016) noted the lack of research investigations and self-talk interventions intended to modify reactive self-talk to become more thought through and effortless. The case made by the model proponents is that comprehending the interaction between self-talk and Systems 1 and

2 processing may shed light in the proposed link between Systems 1 and 2 self-talk and sport performance.

**System 2.** System 2 (reasoning) processing is described as unhurried, demanding, and consciously regulated (Kahneman, 2003). This system is characterised by three attributes: (a) demands mental exertion to process information (Stanovich & West, 2000); (b) is logical and unbiased (emotional neutrality), regulated by guidelines and reason, and susceptible to modifications should different views be presented; and (c) its role is to regulate thinking processes and activity (Stanovich & West, 2000). Self-talk resulting from system 2 processing therefore: (a) demands mental exertion; (b) is susceptible to change due to new information and/or different vintage points' influences; and (c) has a part in regulating reactive self-talk (Van Raalte et al., 2016). For instance, after watching a video of their bout showing good foot defence, a boxer who previously doubted their foot defence may change that view. Evidence of good foot defence may alter reactive self-talk to thought through self-talk.

Countless studies have shown that athletes use self-talk to enhance skill execution Van Raalte and colleagues (2016) refer to self-talk utilised with intent to achieve a specified goal as proactive self-talk. For instance self-talk used in prevailing self-talk research (e.g., Theodorakis et al., 2002; Tod et al., 2011) seem to fit proactive self-talk. Proactive self-talk is linked with System 2 processing and therefore demands mental exertion. Reactive self-talk on the other hand is associated with emotions and therefore with System 1 processing. For instance, upon failing to convert a penalty, costing the team a championship trophy an athlete may instantly say, "I don't belong here," (Van Raalte et al., 2016). The authors point out that when reactive self-talk is brought into consciousness and verbally expressed it becomes accessible for System 2 processing. Once availed to reasoning reactive self-talk can be

changed to become proactive self-talk. For example, “I don’t belong here,” may change to, “I need to practice penalty shootouts more so that I do better next time.”

Van Raalte and associates (2016) mentioned the notion of self-talk dissonance hypothesis. Self-talk dissonance hypothesis relates to the harmony or lack thereof between proactive self-talk and system 1 impressions (e.g., emotions). Precisely, the hypothesis states that harmony between proactive self-talk and the athlete’s feelings about the task at hand yields self-talk consonance, but disharmony results in self-talk dissonance (Van Raalte et al., 2016). Accordingly then, Van Raalte and colleagues (2016) suggested that individuals will use proactive self-talk (e.g., “I am able”) more consistently when the feelings they have about their capability match the proactive self-talk. A mismatch can however, result in athletes reducing their use of the self-talk strategy (frequency) or ceasing to use it altogether.

Considering that System 2 processing demands mental exertion, its capacity can be drained, disturbing processing and reducing performance (Kahneman, 2003; Schmeichel & Baumeister, 2010). Depletion of System 2 capacity may cause dependence on emotions (System 1 impressions), reversing the outcome anticipated from deliberate self-talk (Frankish & Evans, 2009; Van Raalte et al., 2016). Finding ways to lessen depletion of System 2 capacity is thus necessary to reduce dependence on emotions. Van Raalte and associates (2016) have therefore pointed out that the benefits of self-talk practise on performance (e.g., Hatzigeorgiadis et al., 2011) suggest that self-talk rehearsal makes effortful self-talk use effortless. However, research exploring the possibility that self-talk practice may be the medium through which effortful self-talk becomes effortless is lacking and therefore necessary. Moreover, familiarity and being comfortable with self-selected self-talk (e.g., Harvey et al., 2002; Theodorakis et al., 2012) may also be the vehicle, which alters effortful self-talk to be effortless (Van Raalte et al., 2016).

**Behaviour.** Van Raalte and colleagues (2016) acknowledged abundant self-talk and performance research carried out across sports, such as cycling, golf, running, badminton, swimming, and vertical jump. Findings have pointed to the superior effects of instructional self-talk in precision-based tasks compared to motivational self-talk. Moreover, instructional self-talk tended to be more effective in fine than gross motor tasks, while motivational self-talk was found to be more effective in gross than fine motor tasks. In addition, self-talk tended to influence novel task more than learned tasks, with self-talk rehearsal being beneficial to self-talk interventions (e.g., Hatzigeorgiadis et al., 2011; Tod et al., 2011). Unexpectedly, there are indications that negative self-talk was not necessarily detrimental to sport performance, contradicting earlier research (e.g., Van Raalte et al., 1994; 2000).

On the basis of research pointing to the impact of self-talk on behaviour (sport), Van Raalte and associates (2016) proposed that behaviour also impacts self-talk. The proposition suggested that losing (e.g., losing tennis points) or poor task execution (e.g., poor tennis shot) may yield sudden irrational reactions (System 1) such as ‘weak shot’ (Van Raalte et al., 2000). The emotionally fuelled System 1 self-talk may then result in a System 2 based instructional self-talk (e.g., “control your power”) or a self-talk that does not result in adapting (e.g., “you are weak”) and leading to loss in upcoming sets (Zourbanos et al., 2015). Cognisant that research testing their proposed hypothesis was lacking, Van Raalte and associates (2016) invited further research to do so, and to record self-talk during task execution. The model proponents also acknowledged research limitations include laboratory contexts, non-competitive settings, and the use of what Henrich and colleagues (2010) referred to as Western, Educated, Industrialised, Rich, and Democratic (WEIRD) participants. Moreover, few studies employed elite and highly skilled participants taking part in actual competitive activities (e.g., Hatzigeorgiadis et al., 2014).

**Contextual Factors.** Van Raalte and colleagues (2016) proposed that the environment links with System 1 and/or System 2 directly. On that basis, the setting may either stimulate unbiased analysis (System 2) or emotionally charged reactions (System 1), associated with self-talk and behaviour. The ensuing self-talk and behaviour may then affect features of the context (Morf & Mischel, 2012). Herein, context is inclusive of a cluster of conditions such as physical and social features (Merriam-Webster Dictionary, 2015). Physical context encompasses the weather, site, and physical features of the specific sport. Social context includes: people and culture; competition level and ascribed importance thereof; and training, competition, and experimental environments (Van Raalte et al., 2016). In the sport specific model the association between contexts and self-talk is depicted as bi-directional (e.g., Murray, 1997). This suggestion necessitates investigations on how the performer's self-talk potentially mould and impact distinct sporting environments (Van Raalte et al., 2016; Brewer et al., 2006).

Van Raalte and colleagues' (2016) proposition that contextual factors may have an association with self-talk and performance is based on studies that hinted to physical context influences. Among such research are studies, which suggested variances in performers' self-talk use during practice compared to competition settings (Van de Pol & Kavussanu, 2011; Van Raalte et al., 1994; 2000) and between home and away competition settings (Thelwell et al., 2009). Moreover, reports that self-talk use may increase when executing tasks of moderate difficulty (Ferneyhough & Fradley, 2005) added to Van Raalte and colleague' (2016) case for contextual influences on self-talk and behaviour. Recently, evidence for contextual influences has been noted in a recent study (Nedergaard et al., 2021), which found differences in self-talk content between badminton and runners. Badminton athletes' self-talk reflected worry and efforts to contain anxiety whereas runners' self-talk reflected task detachment. Further, differences in self-talk use between high and low intensity among

runners, where high prevalence of shortened, positive, and repetitive self-talk was noted when runners were not pushing themselves, yielding slower running time (Nedergaard et al., 2021) speak to context influence. There are variances in sport demands necessitating an understanding of contextual influence. For instances, some sports have intervals during action (e.g., golf and darts) or last longer (e.g., marathons and soccer) giving performers the opportunity for self-talk use during task performance (Van Raalte et al., 2015). Other sports are short-lived (e.g., sprints and weightlifting), limiting time for self-talk use during task performance. Contextual differences across sports may influence the frequency and structure of self-talk used (e.g., cue words, phrases, and sentences). For example, more time to play could give more opportunities for self-talk use. Longer intervals during play may give room for the use of sentences in self-talk.

To develop effective sport-specific self-talk strategies, there is therefore, need for studies examining self-talk matching the demands of specific sporting contexts (Van Raalte et al., 2016). For instance, self-talk tailored for boxing, a sport which involves short, high bursts of speed and strength work (high intensity interval), may differ for self-talk intervention tailored for golf. In addition, research based on competition settings is wanting (e.g., Hatzigeorgiadis et al., 2014; Tod et al., 2009), and the few documented competition studies did not comprise elite sport training settings. Competition based research will provide the opportunity to test the proposition for competition context influence (Van Raalte et al., 2016).

Besides physical context influences, social settings are incorporated in the sport-specific self-talk model. Van Raalte and associates' (2016) proposition for the social context's role in the self-talk and performance relationship draws from research suggesting cross-cultural differences in negative self-talk incidence. Peters and Williams (2006) found elevated use of negative self-talk among Asian participants compared to their European American counterparts. Moreover, findings suggesting that team culture (Hardy & Hall,

2006), coaching behaviour (Conroy, Coatsworth, 2007; Conroy & Pincus, 2006; Hardy & Hall, 2006; Theodorakis et al., 2012; Zourbanos et al., 2011), and significant others such as teammates and opponents (Hardy et al., 2009) may be linked to athletes' self-talk (Van Raalte et al., 2016). Research testing the propositions is wanting and Van Raalte and colleagues (2016) recognised that most studies cited were correlational in approach, and thus could not provide cause and effect evidence. Experimental studies are thus vital to test propositions regarding the influence of contextual factors on self-talk and performance. For example, experimental studies could investigate the impact that emotionally fuelled environments have on self-talk use and task performance. Targeting the effects of contextual factors on self-talk and performance will enhanced our understanding of what type of self-talk improves performance under given contexts (Van Raalte et al., 2016).

**Personal Factors.** Besides contextual factors, Van Raalte and associates (2016) also proposed the influence of personal variables on self-talk and performance (Van Raalte et al., 2016). Proposed personal factors included generic, personality, and demographic features (Hardy et al., 2009; Morf & Mischel, 2012). The proposition was that personal variables had direct influence on Systems 1 and 2 information processing. The proposition was based on sport self-talk studies, which found that personal factors such as skill level, emotional intelligence, trait anxiety, and belief in self-talk seemed to influence self-talk (e.g., Burton et al., 2011; Hardy et al., 2009; Theodorakis et al., 2012). For example, research indicated more use of self-talk among athletes with better skill and more emotional intelligence than those with limited skill and less emotional intelligence (Lane et al., 2009; Thelewell et al., 2009). Research also found differences in instructional self-talk's effects on accuracy tasks among athletes with different skill levels (Takashi & Van Raalte et al., 2010). Even more, ego orientation (focus on winning) and task orientation (performance process) have been linked to



self-talk use (Van de Pol & Kavussanu, 2011), self-talk valence (Harwood, Cumming & Fletcher, 2004), and belief in self-talk (Hardy et al., 2009).

Overall, the sport-specific model is based on research suggesting the association between Systems 1 and 2 information processing and self-talk (e.g., proactive and reactive self-talk). The model proponents suggested that as self-talk influences behaviour the reverse is also possible, behaviour can influence self-talk through Systems 1 and 2 processing. Beyond proposition of a bidirectional relationship between self-talk and behaviour, the model suggested the influence of individual and external factors on athletes' self-talk and performance. Limitations of cited studies were acknowledged. The necessity for additional experimental research to test proposed interrelations was highlighted, with implications for practice (Van Raalte et al., 2016).

### ***2.1.3 Comparison of Self-Talk Frameworks***

The framework for the study of self-talk in sport and the sport-specific model have parallels and differences. The parallels are unsurprising given that the frameworks focus on self-talk in sport and that the sport-specific model extends Hardy and colleagues' (2009) framework. The differences are also expected considering each model's purpose, approach, and the gaps in research at times of conception.

The frameworks are similar in five aspects: (a) self-talk definition, (b) framework purpose, (c) types of self-talk, (d) the relationship between self-talk and performance (s), and factors that influence self-talk. First, in their definitions, both Hardy and colleagues (2009) and Van Raalte and associates (2016) emphasised the self-directedness of self-talk and acknowledged that self-talk can be overt or covert. Second, secondary purposes of the two frameworks were to identify limitations of research at the time and make recommendations for future investigations. Third, although Van Raalte and colleagues (2016) use terms proactive and reactive, in essence these resemble self-talk functions and valence in Hardy and

associates (2009). Fourth, the sport-specific model and the framework for the study of self-talk in sport centre on acknowledging the relationship between self-talk and performance, recognising that self-talk influences performance. Finally, both models propose that diverse individual and contextual factors influence athletes' self-talk.

Differences between the frameworks were noted in five areas as well: (a) self-talk definition, (b) framework purpose, (c) underpinning mechanisms, (d) direction of relationship (s), and (e) cognitive processing systems. First, in defining self-talk, the frameworks differed in the aspects emphasised. Hardy and associates (2009) emphasised the context (sport-related) and multidimensional nature (e.g., motivational interpretation, function) of self-talk. Van Raalte and colleagues (2016) however, emphasised identifiable grammar and articulation of self-talk. Second, Hardy and colleagues' (2009) framework purposed to summarise literature existing at the time and identify moderating and mediating variables to enhance comprehension of self-talk. Van Raalte and associates (2016) on the other hand aimed to build on the Hardy and colleagues' (2009) framework.

Third, the sport-specific model (Van Raalte et al., 2016) does not directly highlight self-talk mediators. The framework for the study of self-talk (Hardy et al., 2009) however, proposes four distinct self-talk underpinning mechanisms. Fourth, Van Raalte and colleagues (2016) suggested a bi-directional relationship between self-talk and both performance and moderating variables. Hardy and associates (2016) on the other hand proposed a unidirectional association between self-talk and both performance and self-talk mediators. Lastly, whereas the framework for the study of self-talk (Hardy et al., 2009) did not allude to cognitive processing systems, Systems 1 and 2 processing are at the core of the sport-specific model (Van Raalte et al., 2016).

Table 1 below summarises the similarities and differences between the framework for the study of self-talk in sport and the sport specific model.

**Table 1***Hardy et al. 's (2009) Framework and Van Raalte et al. 's (2016) Model Comparison**Summary*

<b>Frameworks</b>	<b>Frameworks</b>		<b>Similarities</b>
<b>Components</b>	Hardy et al., (2009) Framework	Van Raalte et al. (2016) Model	<b>and</b> <b>Differences</b>
<b>A. Self-Talk</b> definition	- emphasis on context of the self-talk (sport)  - highlights self-talk dimensions (frequency, overtiness, content, motivational interpretation, and purpose of the self-talk)	- emphasis on proper grammar  - Highlights overtiness and self-directedness of self-talk.	Different and similar
<b>B. Framework</b> Purpose	- to enhance and expand comprehension of self-talk (e.g., mediators and moderators)  - to identify limitations in the literature.	- to build on earlier frameworks of self-talk in sport,  - to identify limitations in research	Different and similar

<b>C. Self-talk types</b>	Emphasis on self-talk function and valence.	<ul style="list-style-type: none"> <li>- Emphasis on proactive (function) and reactive (valence) self-talk</li> <li>- Notes other types of self-talk, particularly grammatical self-talk.</li> </ul>	Mainly similar
<b>D. Self-Talk and behaviour</b>	<ul style="list-style-type: none"> <li>- Acknowledges the relationship between self-talk and sport performance</li> <li>- Accept that self-talk affects behaviour</li> </ul>	<ul style="list-style-type: none"> <li>- Recognises the association between self-talk and sport performance</li> <li>- Agree that self-talk has an impact on behaviour</li> </ul>	Similar
<b>E. Factors influencing self-talk</b>	<ul style="list-style-type: none"> <li>- Individual antecedents (e.g., personality traits, and belief in self-talk)</li> <li>- Situational antecedents (e.g., match circumstances, coaching behaviours) influence self-talk.</li> </ul>	<ul style="list-style-type: none"> <li>- Personal factors (e.g., personality, belief in self-talk)</li> <li>- Contextual factors (physical and social)</li> </ul>	Similar

<b>F.</b> Underpinning mechanisms	Proposed four underpinning mechanisms: cognitive, motivational, behavioural and affectual mechanisms	Not directly highlighted	Different
<b>G.</b> Relationship direction	Unidirectional relationships between: self-talk and performance, and between self-talk antecedents (personal and situational) and self-talk.	Bidirectional relationships between: between self-talk and performance, self-talk and personal factors, self- talk and contextual factors.	Different
<b>H.</b> Cognitive Processing Systems	Not stated	Role of Systems 1 and 2 dual processing theory characteristics in explaining self-talk content (proactive and reactive self-talk), self- talk content changes (e.g., from reactive to proactive), and impact of self-talk rehearsal.	Different

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## **2.2 Self-Talk in Sport Research Trends**

This section presents current self-talk research in relation to research methods and performance variables targeted in intervention studies. The section also considers the place of single subject studies in future research and draws on reviews of intervention studies to position the present study.

### **2.2.1 Descriptive Research**

Over the years, descriptive self-talk research has contributed to current comprehension of self-talk, and in the planning and implementation of skill-targeted tailored self-talk interventions. Descriptive studies have employed observational methods to capture athletes' self-talk (e.g., Van Raalte et al., 1994), and open-ended questionnaires to explore the use of self-talk among athletes (e.g., Hardy et al., 2001; Van Raalte et al., 2015), and varsity exercisers (e.g., Gammage et al., 2001). In addition, there have been efforts to capture athletes' inner experiences utilising the descriptive experience sampling method (e.g., Dickens et al., 2018).

Themes identified in descriptive studies suggested that athletes and exercisers use self-talk in different sporting contexts, specifically, in training (e.g., Hardy et al., 2001; Gammage et al., 2001) and competition (e.g., Hardy et al., 2001; Cutton & Hearon, 2014). Furthermore, athletes have reported using different types of self-talk (e.g., Hardy et al., 2001; Van Raalte et al., 2015), and using self-talk for different purposes (e.g., Cutton & Hearon, 2014; Van Raalte et al., 2015). Moreover, descriptive findings suggested that athletes use self-talk more during competition than training (e.g., Cutton & Hearon, 2014; Dickens et al., 2018), and that self-talk has an association with contest conditions (Van Raalte et al., 2018).

Yet, methodological limitations are noted. Qualitative and quantitative research cannot speak to cause and effect between variables (Hardy et al., 2009; Van Raalte et al.,

2016). Notwithstanding thoroughly documented limitations of descriptive research, chief among the limitations is memory inaccuracy of retrospective accounts (e.g., Gammage, et al., 2001; Hardy et al., 2001). Moreover, interviews limitations for example pertain to questions posed, standards of what can be conversed about, what informants imagine the interviewer wants, and what participants assume would be acceptable or not acceptable (Hammersley & Gomm, 2006; Hermanowicz 2002). Additionally, critiques have highlighted the potential for irregularities and inadvertent recall bias in informants' accounts (e.g., Brown, 2001). Even more, qualitative studies specifically, utilise limited sample size (e.g., Brown, 2001; Hardy et al., 2001) because of their time-consuming nature, limiting statistical generalisability of findings (Brown, 2001).

Although quantitative methods may pass the sample size limitation, they are limited in uncovering subtle and authentic complexities of subjects (Miller et al., 2002). Extensive reliance on descriptive approaches, therefore, has potential to limit our understanding of participants' experiences. Consequently, this limitation is likely to happen when investigating populations and ideas not well documented (Milner et al., 2002). Regardless of limitations labelled against descriptive studies they continue to play a role in self-talk research (e.g., Dickens et al., 2018; Van Raalte et al., 2018) and may be necessary in some phases of self-talk interventions.

### **2.2.2 *Experimental Research***

Experimental self-talk and performance research has encompassed individual and mental skills package studies. Mental skills package interventions comprise a combination of cognitive strategies such as self-talk, imagery, and goal setting (e.g., Slimani & Cheour, 2016; Thelwell & Greenlees, 2001). Package interventions have been found to enhance sport performance when compared to control conditions (e.g., Barwood et al., 2008; Kolovenis et al., 2012; Slimani & Cheour, 2016), and baseline (e.g., Thelwell et al., 2006; Thelwell &

Greenlees, 2003; Rogerson & Hrychory, 2002). However, package interventions do not provide efficacy evidence for individual strategies, hence this sub sections discusses trends in self-talk intervention studies exclusively.

Support for the usefulness of self-talk interventions has been widely documented, suggesting that self-talk strategies have potential to enhance motor skill performance in sporting activities (e.g., De Matos et al., 2020; DeWolfe et al., 2020Hardy, Begley & Blanchfield, 2015; Hatzigeorgiadis et al., 2011; Kolovelonis et al., 2011; Tod, Hardy & Oliver, 2011). Randomised control, counterbalanced, and single subject experimental studies showed that self-talk effectively enhances motor skill performance (Beneka et al., 2013; Hatzigeorgiadis et al., 2014; Kolovenis et al., 2011). Categorisation of self-talk cues into motivational and instructional self-talk paved the way for comparison studies investigating how the two self-talk functions compare with each other and with control conditions, on performance in sporting tasks (e.g., Hatizigeorgiadis et al, 2011).

Research found that motivational self-talk benefited performance more than control conditions in speed (Boroujeni & Shahbazi, 2011; Wallace et al., 2017), response time (Hanshaw & Sukal, 2016), endurance (Barwood et al., 2015; Blanchfield et al., 2014), and accuracy tasks (Chang et al., 2014; Hardy et al., 2015; Wallace et al., 2017). Instructional self-talk benefitted performance better than motivational self-talk in skill acquisition, retention, and transfer (e.g., Agdasi & Touba, 2012; Hatzigeorgiadis et al., 2011; Zourbanos et al., 2013). This section highlights current self-talk intervention research targeting: accuracy, speed, endurance, distance, tasks execution, and body movement.

**Performance in Accuracy Tasks.** Research comparing the effect of motivational self-talk, instructional self-talk, and control conditions on accuracy reported mixed results. Some evidence pointed to instructional self-talk benefits on accuracy task performance compared to motivational self-talk, which showed less or no difference between pre and post-



test (e.g., Abdoli et al., 2018; Dana, Vaez Mousavi & Mokhtari, 2012; Dorri, Aslankhani & Farokhi, 2015). Research also documented evidence for instructional self-talk's superior benefits on accuracy performance compared to control conditions (e.g., Boubouki and Perkios, 2014a; Malouff, McGee, Halford & Rooke, 2008; Zourbanos, Hatzigeorgiadis, Bardas & Theodorakis, 2013c). Yet, other studies reported equal benefits of motivational and instructional self-talk intervention on accuracy task performance (e.g., Chang et al., 2014; Dana et al., 2012; Zourbanos, Hatzigeorgiadis, Bardas & Theodorakis, 2013). Evidence for motivational self-talk's greater effect on accuracy tasks compared to instructional self-talk has also been reported, though non-significant (Hardy, Begley & Blanchfield, 2015).

Findings suggest that motivational and instructional self-talk may or may not serve the same function on precision tasks performance. Inconsistent findings may be due to differences in: (a) participants characteristics (e.g., novice, beginner, and elite athletes); (b) study design (e.g., random and counterbalanced); and (c) contexts such as laboratory, training, and competition (Hatzigeorgiadis et al., 2011). More research is needed before reaching conclusions and the current thesis will add to such research.

**Performance in Speed Tasks.** Research investigating the effects of motivational and instructional self-talk on speed task performance also found mixed findings. Although earlier research found beneficial effects of both motivational and instructional self-talk on speed task performance (Theodorakis et al., 2000), later studies yielded contradictory findings. For instance, there is evidence that motivational self-talk improved speed task performance better than instructional self-talk (e.g., Boroujeni & Shahbazi, 2011) and control conditions (Hanshow and Sukal, 2016; McCormick et al., 2018). On the other hand, other research showed evidence that instructional self-talk benefited speed task better than motivational self-talk (e.g., McLaughlin and Mathers, 2016). Other findings show no difference between

motivational self-talk and control condition on speed performance (Boroujeni & Ghaheri, 2011). mc

Abovementioned findings suggested that instructional and motivational self-talk may or may not serve the same purpose during tasks demanding speed. There is therefore, need for further research before drawing conclusions. Published studies on self-talk and speed performance are few, but they can be commended for employing skilled athletes in competition (e.g., McCormick et al., 2018; Hatzi Georgiadis et al., 2014) and training settings (Hatzi Georgiadis et al., 2014; McLaughlin & Mathers, 2016). Studies also utilised novice participants, in laboratory settings (e.g., Hatzi Georgiadis et al., 2000). That said, further research employing skilled and novice athletes in real-life settings (training and competition), undertaking mastered and deficient speed tasks is necessary. Further research may shed more light on current knowledge, augment interventions, and establish consistency in findings.

**Performance in Endurance Tasks.** Self-talk and endurance task performance studies focused on motivational self-talk's effects on endurance during cycling. Studies found greater benefits of motivational self-talk compared to control conditions (e.g., Hatzi Georgiadis et al., 2018; Wallace et al., 2017; Chang et al., 2014). Investigations comparing motivational and instructional self-talk yielded inconsistent findings. For instance, some studies found improved endurance performance in both motivational and instructional self-talk groups (e.g., Beneka et al., 2013; Hatzi Georgiadis et al., 2000; Todorovich, 2013). Other studies found motivational self-talk to have greater effect on endurance compared to instructional self-talk (Koloventis et al., 2011). Several recent studies which compared pre-and post-intervention endurance performance found beneficial effects of motivational self-talk (e.g., de Matos et al., 2020; Wallace et al., 2017) and instructional self-talk (e.g., Agdasi & Touba, 2015; Zetou et al., 2014). Inconsistent findings suggest that motivational and instructional self-talk may or may not serve different functions on endurance task performance (Beneka et al., 2013;

Kolovenis et al., 2011). More research is necessary to give insights on factors (personal and/or contextual) that may account to inconsistent findings.

Current self-talk and endurance performance studies employed students and leisure performers undertaking learned tasks (e.g., Blanchfield et al., 2014; Chang et al., 2014; Kolovenis et al., 2011). Most studies used laboratory settings (e.g., Wallace et al., 2017; Hatzigeorgiadis et al., 2018), with few research utilising training environments (e.g., Chang et al., 2014; Kolovenis et al., 2011). Given the handful of research on self-talk and endurance performance, and inconsistent findings, further research is vital to allow conclusions on which self-talk type is most beneficial to endurance demanding tasks. Future research would do well to include skilled athletes and use training (actual), and competition settings. Such research may curb inconsistencies in findings and enhance current understanding of possible factors driving inconsistent findings.

**Task Execution and Skill Acquisition.** The few studies investigating the effects of self-talk on skill execution focused on instructional self-talk. Findings revealed that instructional self-talk benefitted skill acquisition in swimming, taekwondo, and volleyball better than control conditions (e.g., Zetou et al., 2014a; Zetou et al., 2014b; Zetou et al., 2012). These studies however, mainly used novice performers carrying out tasks in training settings. There is need to further investigate the impact of different types of self-talk on task execution and among athletes of different skill levels. Moreover, future research needs to utilise competition settings.

**Performance in Distance Tasks.** Several studies investigated the impact of motivational and instructional self-talk on distance performance in vertical jump, chest pass, volleyball, shot put, and tennis (e.g., Boubouki & Perkos, 2014; Hatzigeorgiadis et al., 2009; Kolovenis et al. 2011; Tod et al., 2009). Findings showed evidence that both motivational and instructional self-talk improved distance performance, including when compared to control

conditions (e.g., Edwards et al., 2008; Hatzigeorgiadis et al., 2008; Panteli et al., 2013). The finding suggested that self-instructions focusing on technique, tactic, and body movement or instructions encouraging oneself to put in more effort and to be persistent equally enhance distance performance.

That said, other studies (e.g., Chang et al., 2014; Hatzigeorgiadis et al., 2004) found superior effects of motivational self-talk over instructional self-talk on distance tasks. The finding suggested that during distance task execution, self-talk that encourages persistence and effort, psyches one up, and boost confidence, helps performance better than technical, tactical, and kinaesthetic focused self-talk. Findings are inconsistent, however, necessitating continued research on the effects of self-talk on distance performance before drawing conclusion. Further research could also explore mechanisms through which self-talk benefits distance performance. For instance, possible cognitive, motivational, and behavioural mechanisms. Cited research on self-talk and distance performance primarily used novice performers undertaking tasks in the field (e.g., Chang et al., 2014; Panteli et al., 2013). Studies that employed skilled athletes mainly utilised laboratory settings (Edwards et al., 2008; Tod et al., 2009). Consequently, research employing athletes in competition and actual training contexts is necessary.

Notably, the effect of self-talk on body movement is the least studied of self-talk and sport performance association, necessitating additional research. Further research would shed light on the effects of different types of self-talk on body movement during task performance. Could it be that self-talk benefits specific and overall performance through its effect on body movement? For instance, in the vertical jump (e.g., Edwards et al., 2009) could it be that self-talk benefited distance performance through its beneficial impact on hip rotation velocity? Similar questions can be asked in relation to power, accuracy, and speed task outcomes. If

self-talk benefits power punches in boxing, is it through attentional focus to specific body movement(s)? We can only rely on further research to answer such questions.

### **2.3 Positioning the Single-Subject Design**

Single-subject designs have been used less than between-subject and within subject designs in research examining pure self-talk. The number of single subject studies in self-talk research is reduced by the fact that many used package interventions - interventions that employed other cognitive strategies alongside self-talk (e.g., Thelwell et al., 2010; 2006), rendering them unsuitable as examples for self-talk interventions. Though less prevalent, single-subject studies have landed support for the beneficial effects of self-talk on performance in accuracy (e.g., Johnson et al., 2004; Landlin & Herbet, 1997; Stomou et al., 2007;), endurance (e.g., Hamilton et al., 2007), and speed (e.g., Cooper et al., 2020; Mallet & Hanrahan, 1997; Rushall et al., 1988) task goals. Many of the few single-subject studies have employed skilled athletes though mainly in practice settings and none in competition environments. Though few, single subject design studies are worth taking stock from given because of their place in real world practice where interventions may often need to be tailored for individuals rather than a group.

Task performance in any sport, team sport included, involves individuals' actions. This hints to the need to tailor mental skills interventions, including self-talk interventions, to individuals' needs. That self-talk intervention research has been predominantly group-centred, limits understanding of benefits or lack thereof to individual athletes. In team or individual sports, individual athletes still need to self-motivate and self-instruct (e.g., Hardy et al., 2001a). Neglecting the relevance of single-subject designs in ongoing self-talk investigations runs the risk of denying the opportunity to uncover and target individual athletes' unique needs regardless of the activity being individual or team sport. Besides, considering the challenges of accessing highly skilled athletes, accessing as many of these

athletes as necessary for adequate statistical power group-based studies may continually be a challenge for between subject designs. Single-subjects studies on the other hand do not require many participants at a time, and thus could be key to accessing and studying skilled athletes' self-talk use, in actual training and competitive settings. This is important for future research to consider.

## **2.4 Review Studies**

Most reviews focused on cognitive strategies in general (e.g., Martin et al., 2005; Tod et al., 2015). Conclusions, limitations, and implications drawn from these reviews are general, limiting generalisation to pure self-talk interventions. This literature review therefore, focused on self-talk intervention reviews.

Tod and colleagues' (2011) systematic review and Hatzigeorgiadis and associates' (2011) meta-analysis were the most suitable for the current literature review given their focus on self-talk intervention studies. The two reviews investigated the possible influence of the matching hypothesis principle in self-talk interventions. The reviews noted efficacy evidence supporting beneficial effects of motivational and instructional self-talk on tasks demanding precision and conditioning, compared to control conditions (Hatzigeorgiadis et al., 2011; Tod et al., 2011). Challenges pertaining to obtaining empirical data in competition were acknowledged. Tod and colleagues (2011) thus suggested that a focus on performance processes (distinct skills) rather than on competitive outcome (overall performance) may be more useful, at least until suitable study designs are established. For instance, counting the number of punches that land and percentage of defence attempts during a boxing bout may currently be more productive than measuring win/loss statistics.

Although self-talk intervention studies mostly focused on motivational and instructional self-talk, Tod and associates' (2011) review included the few self-talk valence studies documented. Findings were inconsistent suggesting that negative self-talk may not

have adverse effects on sport performance. Such findings point to the likelihood that individual athletes may interpret negative self-talk in helpful ways (Hardy et al., 2001a; Van Raalte et al., 1994). However, the results were cautiously interpreted given the limited number thereof, necessitating more research on self-talk valence and performance (Tod et al., 2011). Also noteworthy was evidence that studies, which utilised highly skilled athletes tended to employ single-subject multiple baseline designs (e.g., Landin & Herbert, 1999). Although single subject designs yielded greater effect size than other designs did (Hatzigeorgiadis et al., 2011), Tod and associates (2011) noted that single-subject designs were yet to use methods that can be measured in modern ways, adding that basing future research in theory may be complementary. Interventions based on theory could help shift focus from what Tod and colleagues (2011, p. 680) referred to as “second-generation questions”. For instance, researchers seeking to find out what type of self-talk is helpful rather than whether self-talk is helpful.

Tod and colleagues (2011) acknowledged the suitability of self-talk mediating factors proposed by Hardy and colleagues (2009), in helping us understand the self-talk and sport performance relationship. Self-talk seemed to benefit athletes’ cognitions (e.g., concentration), behaviour (e.g., skill acquisition), and motivation (e.g., confidence). Self-talk mediators have been discussed in an earlier section of this chapter (p.16 – 22). That said, the reviewers highlighted that Hardy and associates’ (2009) mediators categories need to be expanded (Tod et al., 2009). Distinct from Tod and colleagues’ (2009) review, Hatzigeorgiadis and associates (2011) meta-analysis focused on self-talk moderators: a) task characteristics, b) participants characteristics, c) self-talk characteristics, and d) intervention characteristics. Review studies highlighted that few studies targeted highly skilled athletes and that such studies were mostly single-subject multiple baseline designs (Hartzigeorgiadis et al., 2011; Tod et al., 2011). Tod and colleagues (2011) added that there was need for theory

based self-talk intervention, and more research exploring self-talk mediators rather than focusing on the effects of self-talk on performance. Moreover, incorporating methods that can measure non-specific variables (e.g., heightened expectations) during intervention is necessary. Such inclusions may help identify other mediating and moderating variables, adding to what is currently known (Tod et al., 2011).

Indeed review studies are useful in enhancing current knowledge. Nonetheless, caution is necessary when interpreting systematic reviews and meta-analysis because inclusion criteria employed (e.g., English language) may reject some high quality studies. Furthermore, as insightful as systematic reviews may be, reviews do not provide effect size calculations for self-talk effects on sport performance, as well as moderating and underpinning mechanisms effect sizes (Tod et al., 2011). Hatzigeorgiadis and associates' (2011) meta-analysis thus complemented Tod and colleagues' (2011) review, providing effect size calculations on the effect of self-talk on performance and the influence of specified moderators on self-talk. The ensuing systematic review will add to current reviews with a focus on highlighting self-talk intervention research trends and examining self-talk interventions complexities.

Reviewed literature shows evidence for self-talk intervention efficacy, self-talk benefits performance in ideal conditions. Evidence for self-talk effectiveness however, is yet to be established. Questions regarding the effects of self-talk under unpredictable, uncontrolled conditions remain unanswered, limiting our understanding of the self-talk and performance relationship (e.g., Hatzigeorgiadis et al., 2011; Tod et al., 2011). Experimental research on the subject continues to grow, necessitating review on current trends, especially ahead of the envisioned intervention study.



## **2.5 Summary of the Literature Review**

In summary, two models for the study of self-talk in sport were presented, being, Hardy and colleagues (2009) framework and Van Raalte and associates' (2016) model. The two models have more similarities than dissimilarities. Descriptive and experimental studies continue to contribute to advancements in self-talk and sport performance. Given experimental research's ability to evidence causation, such studies have taken centre stage in current self-talk and sport performance research. Experimental studies' have yielded inconsistent findings regarding the benefits of motivational and instructional self-talk on sport performance (e.g., accuracy, speed, endurance, distance, body movement, and task execution). Superior benefits of instructional self-talk over motivational self-talk and vice versa, have been evidenced. Moreover, both instructional and motivational self-talk were found to improve sport performance. By far, studies employed novice performers in laboratory and practice settings, carrying out novel and learned tasks. There is more need for research targeting body movement, power, strength, and overall performance. Also, there is need to investigate self-talk interventions complexities.

## **2.6 Gaps in Existing Research**

Based on published literature discussed, several gaps are noted. First, there is need for self-talk intervention and self-talk research in general to target non-western athletes. Until then findings remain generalizable mainly to WEIRD populations. Second, few studies seem to have examined skilled and highly skilled athletes undertaking accuracy, endurance, body movement, speed, endurance outcome tasks. Third, limited studies have utilised competition and actual training environments. Fourth, few self-talk interventions have targeted combat sport, and none focused on boxing. Self-talk interventions have not included boxing and boxing athletes. Fifth, self-talk research in sport to date is yet to attempt to capture athletes' actual self-talk, particularly with intent to inform self-talk intervention. Sixth, self-talk

intervention findings across task demands remain inconsistent. We are therefore, yet to fully understand how self-talk affects sport performance, and to comprehend possible mediating and moderating variables involved. Seventh, existing self-talk interventions have not demonstrated a solid theoretical foundation, which may partly explain inconsistent findings. Eighth, self-talk research in sport has not explored the potential of using mixed-methods (sequential) approaches in enhancing intervention success. Nine, although the efficacy of self-talk intervention has been demonstrated, evidence for the usefulness (effectiveness) of the strategy in uncontrolled settings (e.g., competition) is yet to be established. Finally, to date, detailed skill-targeted tailored self-talk interventions are yet to be carried out and/or documented.

Sport performance is an individual activity regardless of whether the sport is an individual or team sport. As such using self-talk interventions to improve individual athletes' performance for their and the teams' benefit (in team sport), necessitates tailored interventions. Borrowing from clinical setting approaches, tailored self-talk interventions need to be founded on in-depth understanding of recipients' technical and motivational needs, challenges, and strengths. In clinical settings, gaining in-depth understanding of recipients needs is a process, which is usually initiated and facilitated by interviews and the use of standardised self-report tools. For instance, Structured Clinical Interview for DSM-5R Personality Disorders, SCID-5-PD (First et al., 2015). Intake interviews and self-report measures ensure comprehensive needs analysis from which practitioners formulate informed interventions. Clinical settings utilise interviews notwithstanding the likely inaccuracies or memory bias in respondents' responses.

Individualised interventions in sport settings can take a leaf from clinical settings practices, and consider the usefulness and value of descriptive approaches despite known limitations. This is particularly necessary given insights gained from the framework for the

study of self-talk in sport, suggesting individual and situational moderators, and distinct underpinning mechanisms (Hardy et al., 2009). To formulate and develop tailored self-talk interventions practitioners need to know which moderating variables apply to individual intervention recipients (needs assessment). It is from this vintage point that the current study will employ a mixed methods approach comprising a systematic review, semi-structured interviews, and think aloud methods in the build up to a tailored single-subject experimental design. The tailored skill targeted intervention will endeavour to improve specific boxing skills as per aims and objectives below.

## **2.7 Research Aims**

The general aim of the present study is to add to current self-talk and sport performance knowledge and understanding. The overarching aim will be driven by five secondary aims:

1. To investigate trends in self-talk intervention studies' demographic characteristics, design characteristics, context characteristics, and implementation characteristics.
2. To explore Batswana boxing athletes' self-talk awareness, beliefs and uses with intent to inform a tailored skill-targeted self-talk intervention.
3. To investigate Batswana boxing athletes' actual self-talk use in training.
4. To explore Batswana boxers perceptions of coaching behaviour influences on their self-talk use.
5. To investigate the effectiveness of a tailored skill-targeted self-talk intervention among Batswana boxing athletes, in training and competition.

## **CHAPTER 3**

### **A Systematic Review of Trends in Self-Talk and Sport Performance Intervention Studies**

#### **3.1 Introduction**

Initial self-talk research investigated the effect of stimulus cues (Ziegler, 1987), content instruction (e.g., Rushall et al., 1988), positive self-directed statements (e.g., Van Raalte et al., 1995), and self-instructions (e.g., Mallet & Hanharan, 1997) on sport performance, providing insights into the relationship between self-talk and performance. In the first decade of the 21<sup>st</sup> century self-talk research increased, particularly, investigating the effects of instructional and motivational self-talk on sport performance (e.g., Goudas et al., 2006; Harvey et al., 2002; Hatzigeorgiadis et al., 2004; Tod, et al., 2009). Studies on the subject increased remarkably in the 2<sup>nd</sup> decade of the century (e.g., Abdoli et al., 2018; Agdasi & Touba, 2015; de Matos et al., 2020; DeWolfe et al., 2020; Hanshaw & Sukal, 2016; McCormick et al., 2018).

Self-talk research has scrutinised the effects of self-talk use on accuracy, distance, endurance, body movement, and speed (e.g., Hatzigeorgiadis et al., 2011) across a variety of sport. The wide range of sports that have been studied include basketball (e.g., Galanis et al., 2018), cycling (e.g., DeWolfe et al., 2020; Hatzigeorgiadis et al., 2018), ultra marathon (e.g., McCormick et al., 2018), football (e.g., Zourbanos et al., 2013a), volleyball (e.g., Shariati & Kalhoran, 2016), darts (e.g., Agdasi & Touba, 2015; Hase et al., 2019), swimming (e.g., Ay, Halaweh & Al-Taieb, 2013; de Matos et al., 2020), and athletics (e.g., Cooper et al., 2020; Panteli et al., 2013). Many self-talk studies used laboratory (e.g., Abdoli et al., 2018; Wallace et al., 2016; Wright et al., 2016; Barwood et al., 2015) and training or field settings (e.g., Boubaki & Perkos, 2014a; de Matos et al., 2020; DeWolfe et al., 2020; Galanis et al., 2018).

Moreover, studies have mostly employed students, novices, and beginner athletes (Hatzigeorgiadis et al., 2011; Tod et al., 2011), research also used assigned more than self-selected self-talk (e.g., Hatzigeorgiadis et al., 2011).

Increase in the number of self-talk and performance studies made it possible for review studies (e.g., Hatzigeorgiadis et al., 2011; Tod et al., 2011) on the subject to be carried out. Review studies have possibly helped spotlight the efficacy of self-talk strategies in sport in ways individual studies may never have. The review studies differed in approach with Hatzigeorgiadis and associates (2011) providing a synthesis of findings of self-talk and sport performance intervention studies. Tod and colleagues (2011) on the other hand provided a systematic review of the studies. To some degree, the review studies also differed in focus, Hatzigeorgiadis and colleagues' (2011) review focused on self-talk moderating factors: a) task characteristics, b) participants characteristics, c) self-talk characteristics, and d) intervention characteristics. Tod and associates' (2011) review however, extended its scope beyond moderating variables to include factors that mediate the effects of self-talk on performance. Although distinct in methods of analysis, generally, both reviews reported beneficial effects of instructional and motivational self-talk on sport performance. Moreover, Hatzigeorgiadis and associates (2011) reported evidence for the influential role of several variables including, type of self-talk and athletes' skill level, with Tod and colleagues' (2011) findings suggesting the same.

Besides reporting findings that echoed popular views (e.g., beneficial effects of instructional, positive, and motivational self-talk, Tod and colleagues' (2011) review reported unexpected findings. Specifically, the systematic review found that contrary to existing views at the time, negative self-talk did not hamper performance. Furthermore, the review found inconsistent evidence regarding differences in the effects of instructional and motivational self-talk when considering task characteristics. Inconsistent findings suggest that variables

pertaining to participant characteristics (e.g., skilled and novices), intervention characteristics (e.g., dependent variable, self-talk content), implementation characteristics (e.g., self-talk practice, intervention duration, and treatment randomisation), and intervention settings (e.g., laboratory, practice/field, and competition) are an important part of the self-talk conversation. In fact, Hatzigeorgiadis and associates' (2011) meta-analysis found superior benefits of self-talk strategies on: (1) fine motor demands tasks than on gross motor tasks, (2) task novelty than learned tasks, and (3) when there is self-talk use training than no training. The synthesis also found that instructional self-talk benefited fine motor tasks more than motivational self-talk. The meta-analysis results however, showed similar self-talk intervention effects: (1) for beginners and athletes that are more experienced, and (2) for both self-selected and cues assigned interventions. That is, self-talk was found to be helpful in both early and later stages of skill acquisition and performance, and regardless of whether participants' cues were assigned or self-selected (Hatzigeorgiadis et al., 2011).

As it is, Tod and associates' (2011) review found support for the beneficial effects of self-talk interventions. Hatzigeorgiadis and colleagues' (2011) meta-analysis on the other hand provided evidence for the efficacy of self-talk interventions. The reviews were however, based on studies conducted mainly in laboratory and training than on real world competitive settings. Questions regarding the effects of self-talk under unpredictable, uncontrolled conditions thus remain unanswered and review studies raised the same concern. Hatzigeorgiadis and colleagues (2011) challenged future research to include a broader scope of tasks and skills than were represented in papers reviewed. They noted the need for studies to include tasks that engage different motor and cognitive demands, such as tasks in competitive settings. Tod and associates (2011) also pointed out the limited number of studies available to allow a thorough review of self-talk effects in competitive settings. Consequently, and given growth in self-talk intervention studies since, a review of current

trends is vital ahead of the envisioned tailored, skill-targeted self-talk intervention in real world conditions.

Hatzigeorgiadis and colleagues' (2011) and Tod and associates' (2011) findings on moderating factors in the self-talk and performance relationship underscore the importance of understanding: (1) who self-talk interventions work for, (2) how self-talk strategies work, and (3) contexts in which they work. Practitioners have a better chance of delivering effective self-talk strategies when such interventions are founded on a better knowledge and understanding of various intervention components that interact during delivery. Besides, knowledge and understanding of intervention complexities can drive tailored skill-targeted interventions, augmenting effectiveness thereof among intended recipients, curbing the gap between research and practice. On that account, it is worth bringing intervention complexities into discussion for purposes of trends categorisation rather than complexities analysis.

### **3.2 Intervention Complexities**

Documented research acknowledges that a variety of variables play a role in how interventions are carried out and on the effect such delivery has on outcomes. The proposition, therefore, is that three distinct complexity areas affect the relationship between taking part in an intervention and the resulting outcome(s). Three intervention complexity have been suggested: (1) complexity in design, (2) complexity in environmental context, and (3) complexity in implementation (Anderson et al., 2013). For instance, when some athletes do not complete an intervention while others do, there might be an explanation(s) to what inhibited them from completing the intervention. The explanation(s) may have to do with the intervention design, intervention context, or intervention implementation, and this will affect the usefulness of the intervention (Hut et al., 2021).

### **3.2.1 *Complexity in Intervention Design***

Understanding complexity in intervention design entails scrutinizing factors such as method of intervention delivery, who delivers the intervention, the intervention content, and duration of the intervention (Hynynen et al., 2016). For instance, to understand differences in the effectiveness of a self-talk strategy in enhancing specified performance (e.g., reaction time) requires an analysis of specific and distinct intervention characteristics that may have contributed to the outcome. Establishing distinct intervention variables (e.g., type of self-talk used and characteristics of the task), which interrelate to influence outcome can enhance our understanding of what is more likely to yield desirable outcomes. A review of evidence extracted from interventions which target a similar performance area (e.g., speed), can enlighten us on whether such performance improvements are a result of joint or independent intervention characteristics. For example, are improvements in speed performance a result of task novelty independently or due to both task novelty and self-talk content? That is, would the results be the same if athletes carried out a task depending on novelty or familiarity regardless of the type of self-talk used or would both task novelty and type of self-talk used affect the results. Enhanced understanding of complexity in intervention design could allow informed recommendations on specific intervention design components likely to yield positive or negative outcomes.

It is important to note challenges faced by reviews of complexities in intervention design. As noted by Ely and colleagues (2020) and Hynynen and associates (2016) the common challenge relates to the quality of reporting included in documented research. Specifically, reported information regarding the intervention design may be unclear (Ely et al., 2020) or be inadequate, hindering thoroughness in conclusions that can be made on intervention design components (Hynynen et al., 2016). Limited information regarding intervention design specifics impedes the review of complexities in intervention designs.



Providing information on for example, intervention objectives and who provided the intervention, but withholding details on intervention content will hamper knowing specifics about intervention components. That said, efforts to examine the possible role of multiple design characteristics on outcome is necessary.

### ***3.2.2 Complexity in Environmental Context***

Context signifies attributes and conditions comprising a variety of factors in which an intervention is delivered (Pfadenhauer, et al., 2015). As an extensive system where an intervention is delivered context consists of environments such as the geographical, cultural, social, organisational, and the political (Petticrew et al., 2013). More relevantly, environmental context in self-talk research includes settings where interventions are carried out (e.g., laboratory, field, and competition), the type of sport targeted (e.g., team sport and individual sport), and societal context (e.g., collective culture and individualistic culture). Accordingly, context interrelates, affects, alters, and aids or hampers the intervention and delivery thereof (Pfadenhauer et al., 2015). That is, the effects of a self-talk intervention carried out in an uncontrolled setting (real world), targeting the sport of boxing (individual sport) in a collective culture may be different from the effect of the same intervention, carried out in a similar setting and culture but targeting the sport of football (collective sport). Knowing how context variables play a role in interventions' usefulness and ways interventions work can enlighten us on specific interventions and inform recommendations. Further, with improved knowledge, research and practice can advance in comprehending intervention effectiveness and complexity. For example, supposed there are numerous self-talk interventions designed to improve endurance performance among boxing athletes, recognizing that low endurance rate negatively affect performance in the final round of playing. Besides investigating the impact of intervention components, to understand the effects of self-talk strategies used, analysis could include contextual variables that are likely

to influence endurance performance during a bout (e.g., the boxer's diet and rest time ahead of play). An intervention that targets endurance performance, therefore, may yield different outcomes depending on whether a player had little rest-time ahead of play and/or had inadequate meals before match day. This underscores the importance of identifying and documenting intervention contexts that influence specific outcomes. Doing so can aid replication and inform real world practice. Indeed, also considering design complexity related to the interaction between different performance aspects in boxing (e.g., speed, endurance, accuracy, strength, body movement), which contribute to overall performance.

Identifying intervention contexts of prevailing studies is of interest in the current study because the findings will guide an intended real world, tailored, skill targeted self-talk intervention. Documented self-talk intervention review studies have generally investigated the setting component of intervention context (e.g., Hatzigeorgiadis et al., 2011; Tod et al., 2015). The review studies have not analysed other context components including type of sport, cultural, and geographical location. Yet, contradictory findings regarding, for example, differential effects of instructional and motivational self-talk based on tasks characteristics (e.g., Abdoli et al., 2018; Chang et al., 2014; Hardy et al., 2015; Panteli et al., 2013; Tod et al., 2011) suggest possible interaction of intervention context variables such as type of sport (individual versus team sport) and intervention settings (e.g., laboratory versus training). The importance of examining whether single contextual factors or an interaction of several have a bearing on intervention outcomes is paramount.

### ***3.2.3 Complexities in Intervention Implementation***

Pfadenhauer and associates (2015) consider implementation to be a premeditated and intentional endeavour meant to introduce a specific intervention into practice, in a specific setting. Complexities in intervention implementation comprise specifics relating to who delivers the intervention, recipients' engagement during intervention implementation,

modifications introduced during delivery, degrees of exposure to the intervention, intervention duration, and randomization or equivalent (where applicable). Current self-talk reviews have noted self-talk practice, self-talk overtness, strategy manipulation, and randomisation (e.g., Hatzigeorgiadis et al., 2011; Tod et al., 2011). Still, reviews have fallen short of exploring the role of other implementation variables, including, who delivered the interventions, recipients' engagement, and intervention duration. Such exclusion hinders insights into whether length of intervention and who delivers the intervention matters. Yet, such knowledge is particularly critical in real world conditions where practitioners may be time constrained or recipients be limited financially to engage a practitioner, and for longer periods if that is needed. Moreover, such knowledge is important in real world practice where performance stakes are high because they determine team selection, qualification to major tournaments and/or podium finish. Truly, exploration of intervention implementation variables may be limited by information studies document regarding said factors (e.g., Bates et al., 2019; Gledhill et al., 2018). Studies may not report necessary details and specifics relating to interventions carried out, hampering conclusions on specific elements of interventions, and so limiting replication (e.g., Ely et al., 2020; Hynynen et al., 2016). Still, it is vital that we have better knowledge of variables at play during intervention delivery: (1) who administered the intervention; (2) whether recipients engaged with the intervention; and (3) whether the intervention duration short and long.

In short, intervention complexity speaks to interactions between components within an intervention. The dimensions of design, context, and implementation complexities are not necessarily focused on the number of components in the intervention itself. Dimensions of complexity could instead be in relation to range of likely outcomes, variances in populations targeted or the number of interlinks between components within the treatment and control interventions (Medical Research Council, 2021). For instance, in the current study

complexity can be in relation to the number of interactions between variables such as task novelty, skill level, self-talk content, task goal, self-talk practice, setting, and type of sport. It is therefore not simple to distinguish between simple and complex interventions.

### **3.3 Aim, Objectives, and Questions**

The current review aims to address the complexity assessment gap evident in prevailing self-talk research and review studies. Four objectives will facilitate the review. First, the review seeks to identify trends in self-talk intervention and performance literature. Second the review endeavours to assess interactions between intervention design, context, and implementation components within self-talk intervention studies. The review asks:

1. Given the continued increase in self-talk intervention research in sport, what are current trends in:
  - a. Sample characteristics of reviewed self-talk intervention studies – gender, sample size, age, and participants skill labels?
  - b. Intervention design - self-talk type, task novelty, study design, and task goal targeted?
  - c. Intervention context – type of sport, geographical location, and intervention setting?
  - d. Intervention implementation – self-talk practice, intervention duration, testing, and manipulation check?
2. How many interactions exist between self-talk type, task novelty, type of sport, intervention setting, self-talk practice, skill level, and self-talk duration?
3. What interactions between self-talk type, task novelty, type of sport, intervention setting, self-talk practice, and intervention duration contribute to desirable or undesirable results in self-talk interventions?

### 3.4 Method

#### 3.4.1 Search Strategy

The present review study was conducted in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement guidelines (Moher, Liberati, Tetzlaff & Altman, 2009). A systematic search of peer reviewed articles, papers in open access, dissertations, and available unpublished manuscripts investigating the effects of self-talk interventions on sport performance among healthy participants was conducted. The search targeted studies which employed randomised control trials (RCTs) (e.g., Paravlic et al., 2018). Borrowing from Hatzigeorgiadis et al. (2011) meta-analysis, studies for the present review were assembled through electronic journal searches, review articles, manual searches, and personal correspondences, limited to the English language. Manual search incorporated backward referencing where reference lists of extracted full-text articles and review papers were scrutinized to identify fitting studies possibly missed during the searches. The study made use of EBSCO, SCOPUS, PsycARTICLES, Sport Discuss, PsycINFO, Medline, PROQUEST, Google Scholar, and ExLibris databases from October 2016 up to December 2021. The search strategy employed key words such as *self-talk*, *self-instruction*, *self-statements*, *stimulus cuing*, *self-verbalisations*, and *mental skills* alongside *sport*, *motor*, *motor performance*, *motors skills*, *sport performance*, *task performance* and *package* (Hatzigeorgiadis et al., 2011). The search process closed when results consistently yielded duplicates.

#### 3.4.2 Inclusion and Exclusion Criteria

Aligned with the Hatzigeorgiadis et al. (2011) synthesis, studies, and intervention conditions were included based on the following five criteria: 1) *Language*: publications that used the English language, though this meant a language bias limitation. 2) *Study Design*: randomised controlled studies (or equivalent) that investigated the self-talk and sport

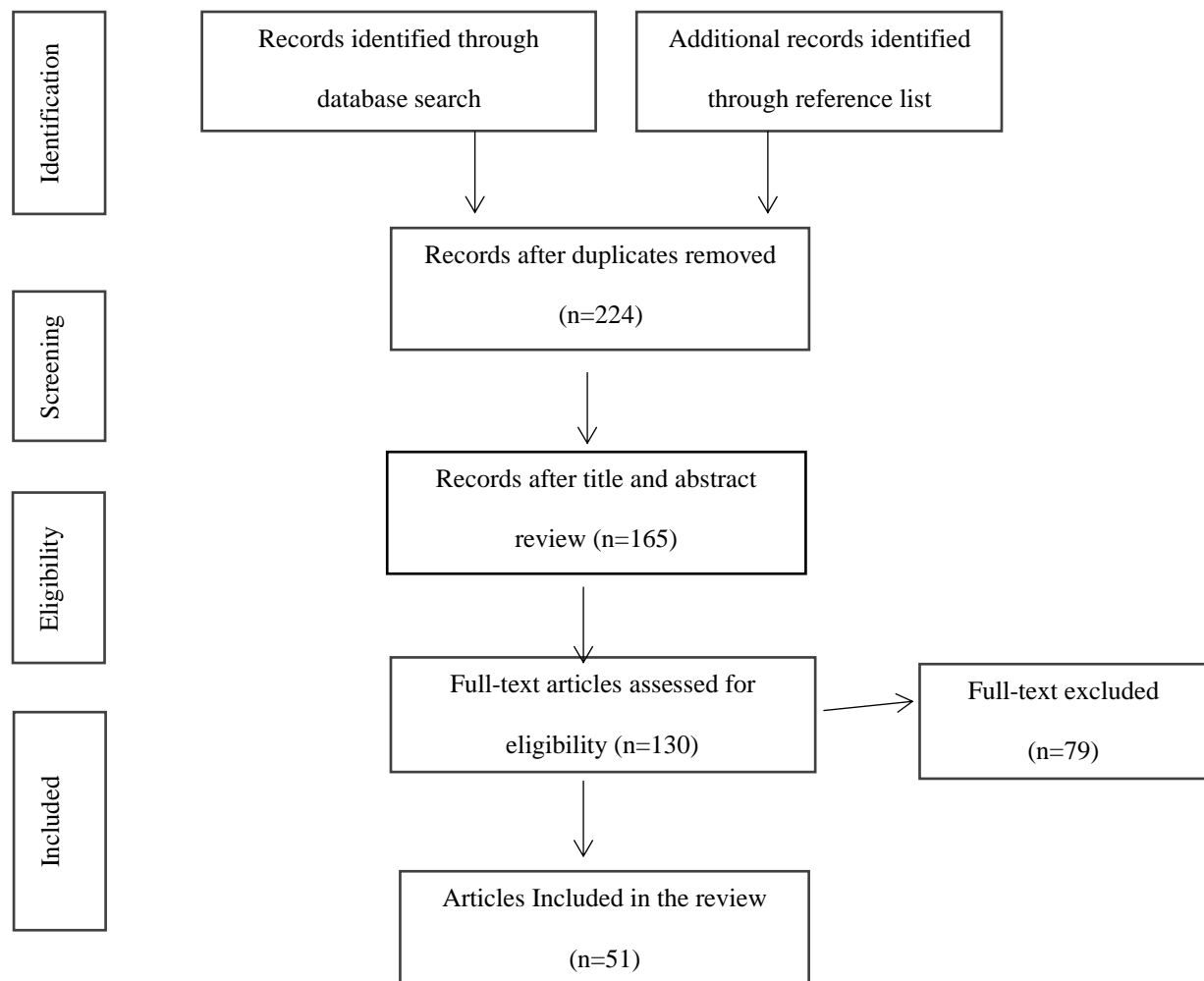
performance relationship. 3) *Package*: package intervention studies that entailed a self-talk only intervention group to allow comparison of pure self-talk interventions with mental strategy package interventions. 4) *Valence*: intervention groups or conditions, which utilised self-talk valence whose aim was to augment sporting skill performance, 5) *Independence*: studies and intervention conditions whose group(s) used unassisted self-talk. Studies were thus excluded based on: (i) the use of languages other than English, (ii) non-randomised, uncontrolled studies, (iii) mental skills package studies that did not have a self-talk only intervention group, (iv), studies of intervention groups that used only negative (e.g., Van Raalte et al., 1995) or inappropriate self-talk (e.g., Theodorakis et al., 2001) on the ground that they did not fit the aim of the current study, and (v) intervention groups or conditions that employed aided self-talk (e.g., use of headphones) were excluded.

### **3.4.3 Screening Strategy**

Guided by the supervisory team the reviewer carried out study identification, screening, and data extraction. The reviewer screened study titles during the electronic searches to determine the pertinence of articles and papers outside the study scope were deemed ineligible. The screening phase was followed by an evaluation of abstracts utilising the pre-decided inclusion and exclusion criteria. Thereafter full texts of articles that met the inclusion criteria were extracted. Articles which were identified through networks were also assessed (abstracts) to ascertain eligibility. Relevant data was then entered into a table comprising columns for the different study variables. During this process reference lists of extracted papers were assessed (backward reference searching) for articles potentially missed during the electronic searches (e.g., Paravlic et al., 2018). Any uncertainty about the eligibility of a given study was discussed with the main supervisor to ensure that the review process was conducted according to the guidelines. The selection process for the current study is illustrated in fig. 6 below.

**Figure 6**

*PRISMA flowchart illustrating the literature search at each stage*



PRISMA Preferred Reporting Items for Systematics Reviews and Meta-Analyses.

### **3.4.4 Data Extraction**

Aforesaid inclusion and exclusion criteria was used to examine reviewed studies.

Upon satisfying criteria the content of reviewed papers was quantitatively scrutinised.

Variables extracted included, (1) participants characteristics (gender, age, sample size, mean age, and participant label), (2) intervention design components (subjects design, dependent variables, self-talk content, type of control, self-talk assignment, and task novelty),

intervention context characteristics (type of sport, intervention setting, and geographical location), and intervention implementation components (self-talk practice, intervention duration, overtiness, manipulation check, and treatment). The procedures allowed a clearer way of organising review studies, yielding an organised table that helped distinguish trends and answer the study objectives. Studies were listed in reverse chronological order. Coding showed studies that investigated multiple dependent variables separately (e.g., Agdasi & Touba, 2012, study 1; Agdasi & Touba, 2012, study 2). Data tables were produced on excel spreadsheet, showing variables related to participants demographics (e.g., age, skills level, and sex) and intervention characteristics (e.g., design variables, context variables, and implementation variables).

#### **3.4.5 *Statistical Analyses***

The data tables mentioned above were scrutinised to produce summary tables and diagrams presented in the results sections. Intervention characteristics were categorised according to design, environmental context, and the implementation of the intervention. Categorisation was guided by literature, which has identified the three categories as distinct areas of complexities in interventions (e.g., Anderson et al., 2013) or discussed specific complexities (e.g., Hynynen et al., 2016; Petticrew et al., 2013). The demographics, design, context, and implementation characteristics were then summarised using a tally count. Excel spreadsheet was used to produce diagrams for context characteristics, allowing further analysis. Coding of the data into was a process that involved continuous review of methods sections of studies under review to ascertain that all considered studies were thoroughly assessed. This processed resulted in few studies, which were initially retrieved to be excluded in the final analysis as discussed in the results section.



### **3.5 Results**

The results presented are based on analysis of studies which were identified, screened for eligibility, and included as shown in the PRISMA flow chat in Fig. 5 above. The results section will first present demographic characteristics findings. Thereafter, findings on self-talk research trends (question 1) will be presented, followed by findings relating to interactions questions (question 2 and 3).

### **3.6 Descriptive Characteristics of Reviewed Studies: Demographics Characteristics**

Analysis of reviewed studies allowed for a clear comprehension of participants and intervention components researchers used. The current review spotlights trends identified in descriptive characteristics (Table 2 below). The review was based on a total sample size of 3734 participants (1770 male, 1455 female, and 509 not specified). Further, as depicted in Table 2, 70.67% of studies utilized less than 60 participants, 60.67% used mixed-sex samples, and 56% employed participants whose age ranged from 17 to 39 years. Competitive athletes were less frequently recruited (30.67%) compared to students and novices combined (57.33%).

**Table 2***Sample Characteristics of Participants Employed in the Reviewed Research*

Characteristic	Total
Gender	
Male only	15
Female only	13
Combined	38
Not specified/clear	8
Sample size	
<20	13
20-39	16
40-59	24
60-79	13
80-99	5
100+	7
Mean age (years)	
<17	19
17-39	42
40+	1
Range	

Not stated/clear	5
	8
Participants Label	
Semi-skilled/ skilled/semi- elite/elite/competitive	23
Pre-novice/novice/beginners	14
Primary-Secondary student/youth	11
University student	18
Experienced	5
Leisure	3
Not stated	1

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Total participants = 3734; male participants = 1770; female participants = 1455; not specified = 509

# **1. What are current trends in self-talk intervention design - self-talk type, task novelty, study design, and task goal targeted?**

Table 3 below Intervention Design Components shows that most self-talk intervention studies reviewed used a between-subject design (77.33%). More than half of the reviewed studies targeted accuracy performance (50.66%) than they did distance, endurance, and speed performance goals (14.67%, 13.33%, and 16%, respectively). Analysis showed that 29.33% of reviewed studies investigated instructional self-talk (only or in comparison to control),

28.05% studies scrutinized motivational self-talk (only or in comparison to control), and 34.67% of studies investigated both instructional and motivational self-talk (comparison). In most review studies, participants were assigned self-talk cues (70.66%) compared to 12% self-selected, and 17.33% collaboration (between participant and researcher/coach). For more than half the studies (34.66%) participants engaged in novel tasks, and in 61.33% of interventions respondents carried out learned tasks. Table 3 below depicts total number of reviewed studies applicable to specified design characteristics.

**Table 3***Intervention Design Characteristics of the Reviewed Research*

Design Characteristics	Total
Between versus within versus Single	
Between subjects	58
Within subjects	9
Single subject	8
Dependent variable	
Accuracy	38
Distance	11
Endurance	10
Speed	12
Execution	3
Various	1
Self-talk content	
Instructional self-talk	22
Motivational/positive self-talk	20
Instructional versus Motivational	26
Other	7

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Assigned versus self-selected	
- Assigned	53
- Self-selected	9
- Collaboration	13
Novel versus learned tasks	
- Learned	46
- Novel	26
- Not clear/stated	3

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## 2. What are current trends in self-talk intervention contexts – type of sport, geographical location, and intervention setting?

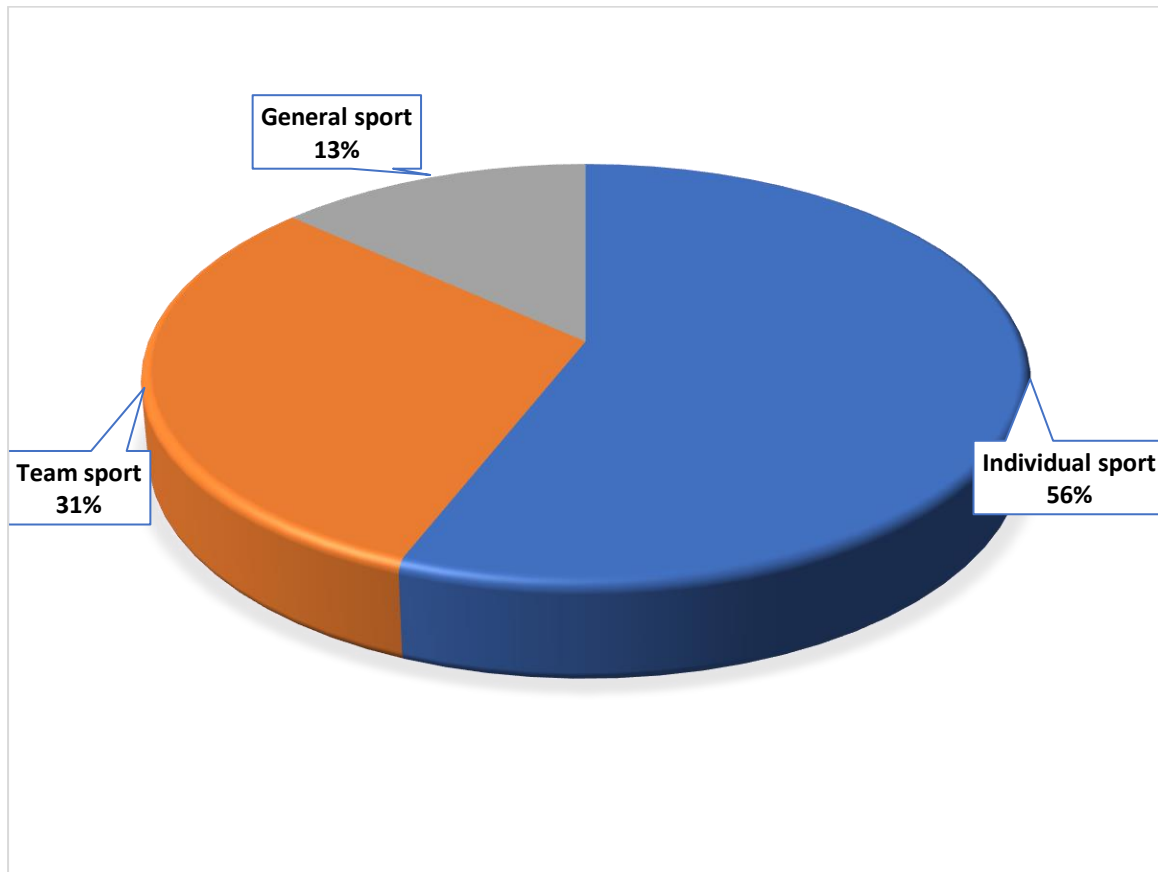
### *Context Characteristics*

Literature analysis presented the opportunity to identify contextual trends in current self-talk and performance studies (Table 3). Contextual trends were categorized according to type of sport, intervention setting, and geographical location. Context characteristics trends are reported in the order, type of sport, intervention setting, and geographical location.

**Trends in Type of Sport.** Figure 6 below shows that self-talk intervention studies have mostly targeted individual sports ( $n = 42$ ) compared to team sports ( $n = 23$ ). Some studies have focused on tasks considered general to several individual and team sports (e.g., treadmill use and jump). Trends in individual sport trends were analysed further given the relevance thereof to envisioned intervention study.

**Figure 7**

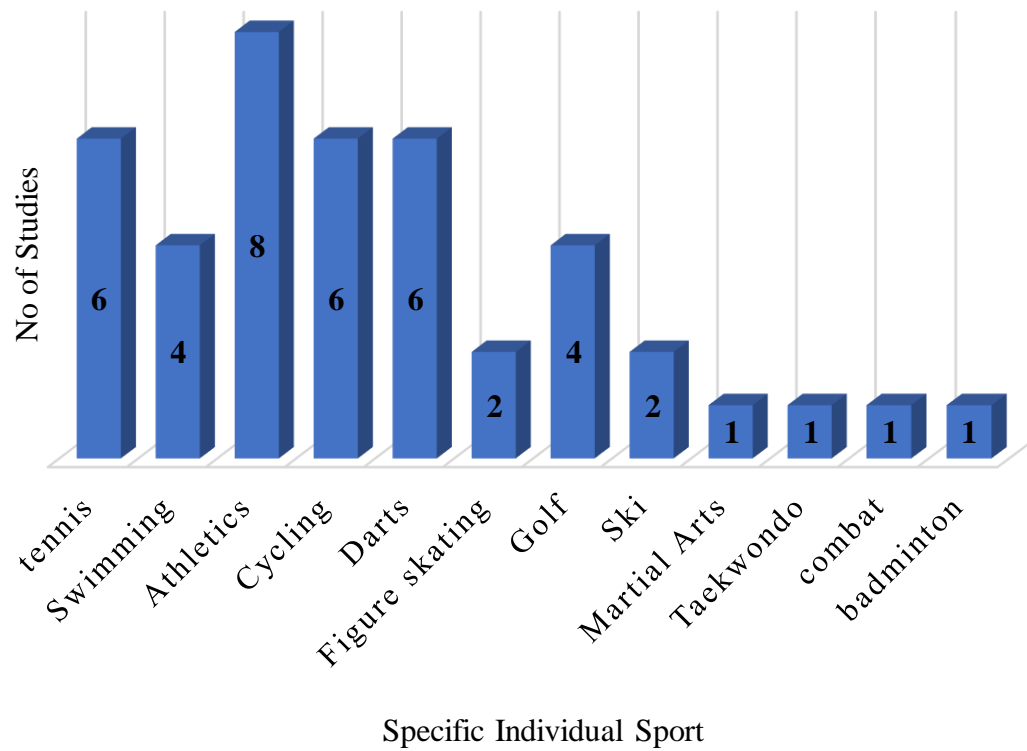
*Type of Sport Trends in Reviewed Studies*



**Trends in Individual Sports.** Further analysis of individual sports trends showed that approximately 20% of studies which targeted individual studies, focused on athletics, followed by tennis, cycling, and darts (14.29% each). Individual sport less targeted included figure skating and ski (4.76 each) and taekwondo, martial arts, and badminton (2.38% each). The above are depicted in figure 7 below.

**Figure 8**

*Individual Sports Trends in Reviewed Studies*

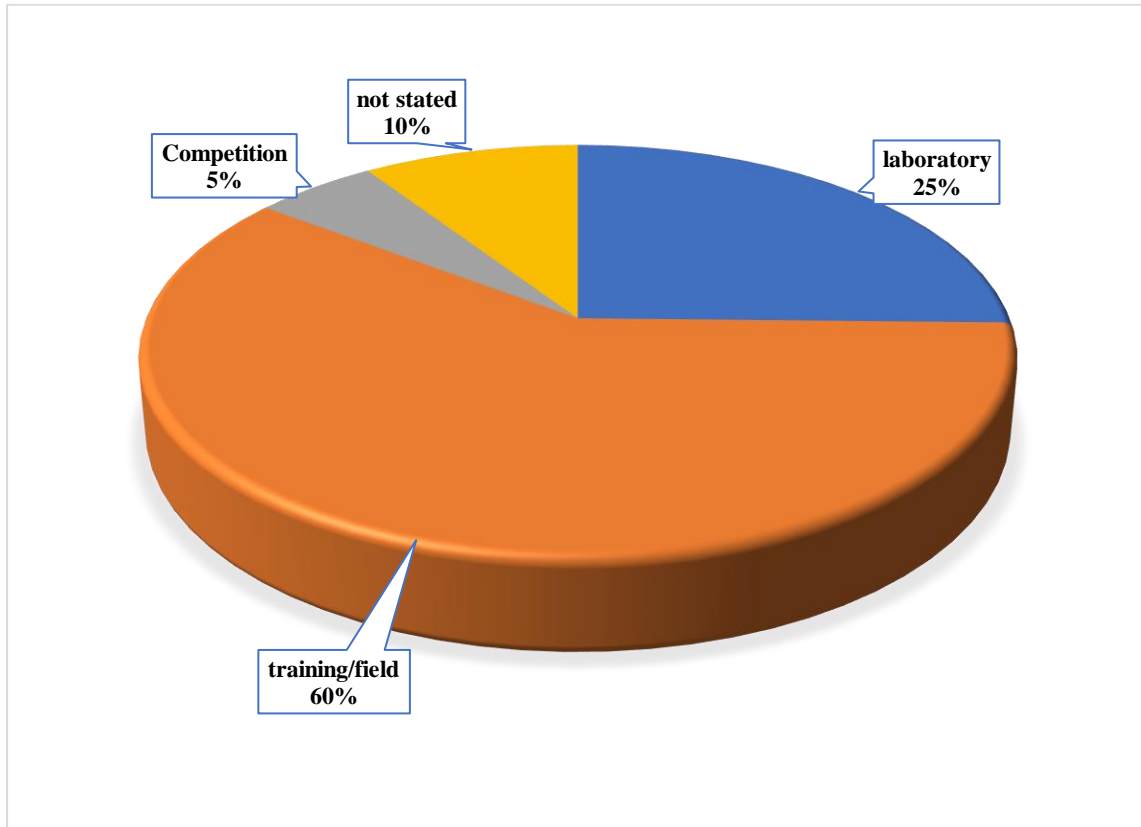


**Trends in Intervention Settings.** Figure 8 depicts self-talk interventions setting representation in reviewed studies. The diagram shows that more than half of self-talk intervention studies reviewed were conducted in field or training settings. Laboratory settings accounted for a quarter of settings used. Competition settings accounted for a 5th of settings, and a tenth of studies were vague or did not state the study setting.



**Figure 9**

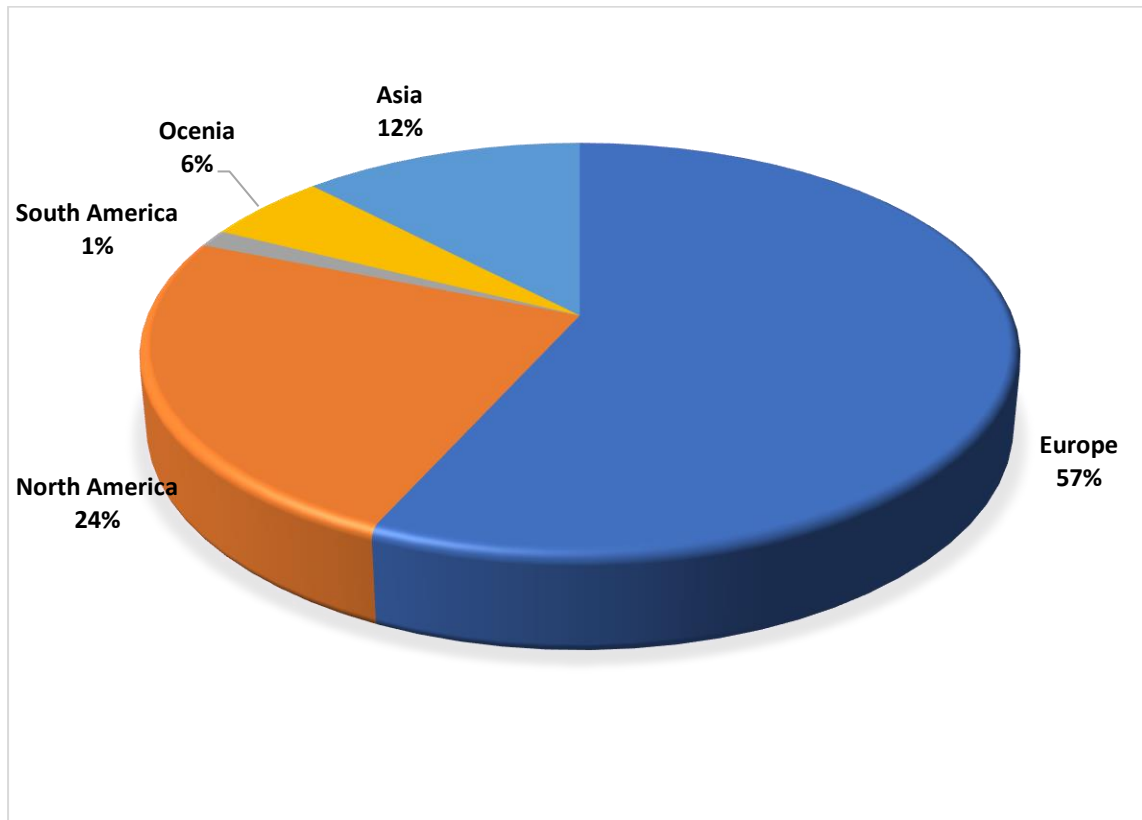
*Intervention Settings Trends of Studies Reviewed*



**Trends in Geographical Location.** According to figure 9 below, more than half of all self-talk and performance intervention studies were conducted in Europe (57%). North America accounts for approximately a quarter of reviewed intervention studies, whereas Oceania, South America, and Asia shared the remainder of the studies (17% combined).

**Figure 10**

*Geographical location trends in reviewed research*



**3. What are current trends in self-talk interventions implementation – self-talk practice, intervention duration, testing, and manipulation check?**

***Intervention Implementation***

Analysis of reviewed studies showed that 42.66% of interventions employed self-talk practice, 38.67% interventions did not use self-talk practice, and 14.67% of studies either did not state or information regarding self-talk rehearsal was ambiguous. More studies employed short interventions of one day duration (40%) or lasting two days to two weeks (29.33%). Interventions lasting more than a month comprised 16% of the reviewed studies total. Most studies employed pre-post-test measures (85.33%). Over half of the studies (68%) reported

using a manipulation check process to gauge self-talk use, whereas 25.33% of the studies did not specify or it was not clear if the utilized manipulation check. Table 4 below shows total number of reviewed studies fitting specified implementation characteristics.

**Table 4***Intervention Implementation Characteristics of Reviewed Research*

Implementation characteristics	Total
Self-talk practice	
- Practice	32
- No practice	29
- Not stated/clear	11
Intervention duration	
- Once/1 day	30
- 2 days – 2 weeks	22
- More than 2 weeks to a month	7
- More than a month	12
- Not clear/stated	4
Testing	
- Pre-post	64
- Post	9
- Not stated/clear	2
Strategy manipulation check used	
- Manipulation check used	51
- Overt	5
- Not stated/clear	19

### 3.7 Discussion

The present study aimed to identify the complexity analysis gap in self-talk intervention studies. First, the review sought to review current trends in self-talk intervention and sport performance literature. Second, the study endeavoured to assess interaction complexity between specific components in intervention design, intervention context, and intervention implementation. Current findings on trends in specified intervention design, intervention context, and intervention implementation are indicative of components that have been examined extensively and those lagging behind.

Generally, the present review showed that self-talk intervention studies have been extensive in employing design components such as the use of between subject designs, targeting accuracy performance tasks, employing both instructional and motivational self-talk, assigning self-talk to participants and using novel tasks. With the exception of trends on performance goal and proportional use of both instructional and motivational self-talk, widespread use of between subjects designs, assigned self-talk cues, and learned tasks have been reported previously (e.g., Hatzigeorgiadis et al., 2011). Present findings thus corroborate Hatzigeorgiadis and associates (2011), self-talk intervention studies continue to predominantly use between subjects intervention designs, assign self-talk cues or phrases to participants, and to employ tasks familiar to participants. Regarding self-talk assignment, Hatzigeorgiadis and colleagues (2011) noted that the use of assigned self-talk does not hamper self-talk efficacy, suggesting that researcher assigned cues are suitably assembled. Still, noteworthy is that in the past decade (since the aforesaid review was published), interventions have increasingly employed collaborative (e.g., Cooper et al., 2020; de Matois et al., 2020; DeWolfe et al., 2020) and self-selection (Hase et al., 2019; Horcajo et al., 2019;

Walter et al., 2019) of self-talk cues, but not enough to dismiss the efficacy assigned cues, to date.

Elevated use of learned tasks in self-talk interventions compared to unfamiliar tasks, was also reported in Hatzigeorgiadis and colleagues' (2011) synthesis. Perhaps expectation can be that as self-talk research calls for more inclusion of skilled and experienced athletes, learned tasks would not fall off the target list, but rather solidify its place because skilled participants by nature have learnt skills of their sport. Besides, interventions have primarily looked to enhance performance and practitioners using self-talk strategy in work with athletes do so to improve performance. That however, is not to imply that self-talk interventions are not important at skill acquisition level, thus novel tasks need to also be equally targeted. Essentially, although benefits of self-talk have been reported to be higher in novel than learned tasks, indications are that benefits are still notable in later stages of skill acquisition and in augmenting performance (Hatzigeorgiadis et al, 2011). Also, learning the self-talk strategy at skill acquisition may refine its use and possibly enhance effectiveness thereof in various performance settings (e.g., competition). The importance of continued research targeting both learned and novel tasks thus cannot be undermined.

There are contradictory intervention design related findings between the present and previous studies. For instance, the current study found somewhat proportional use of both motivational and instructional self-talk, a contradiction to early review findings (Hatzigeorgiadis et al., 2011; Tod et al., 2011). The studies reported greater use of instructional self-talk than motivational self-talk. There are possible explanations to current findings. The current review included positive self-talk in the motivational self-talk category rather than separate, explaining in part, increased motivational self-talk studies. Also, it is possible that over the past decade research has employed designs that compare the self-talk functions more than before. Further, there may be a broadening of targeted performance goals

(e.g., speed, endurance) beyond precision-based goals (e.g., accuracy) compared to when early reviews were documented. Indeed, a closer analysis of performance goals targeted in self-talk interventions recently show that although accuracy performance remain high on the target list, interest on distance, endurance, and speed performance has grown. Although existing reviews did not categorise performance goals in similar ways to the present study, per say, reports on motor demand tasks (Hartzigeorgiadis et al., 2011) and general, precision-based, and condition-based tasks (Tod et al., 2011), point to a sustained focus on fine motor and precision based tasks than other tasks. In that, previous reviews and the current harmonize.

Self-talk intervention context trends are worthy of attention because for example, intervention settings can help distinguish efficacy and effectiveness issues. Whereas controlled conditions and modified field settings yield insights on where interventions improve outcome or not, they do not shed light on intervention usefulness in real world conditions, where variables internal and external to athletes have influence (Hardy et al., 2009; Van Raalte et al., 2016). With clear cut efficacy and effectiveness differences acknowledged, current findings, like previous reviews, found that training or field conditions remain the most used of settings, and with the use of controlled settings also used more compared to competitive settings. Consequently, more remains known about the efficacy of self-talk strategies and less about the effectiveness thereof. Yet, heightened insights on the benefits of self-talk in sport performance demand concerted targeting of competition settings. Competition environments present conditions that are likely to draw the use of different self-talk functions (e.g., Latinjak et al., 2019) For instance, a tennis player practicing with their coach as the opponent may not need to psych themselves up, talk themselves into regulating emotions or hitting a target to similar degree they would in a competition setting.

Intervention setting is not the only context component at play during self-talk intervention in sport. The type of sport targeted (e.g., individual or team), the team environment or simply members of the team even in individual sport (Van Raalte et al., 2017) cannot be undermined in self-talk and performance research. The current review shows that individual sports have been the primary target of self-talk intervention research to date, suggesting that insights we have on the effects of self-talk may be more telling of individual sports than team sports. On that basis, questions necessary in practice for team setting (Van Raalte et al., 2017), which pertain to self-talk relevance (e.g., team culture/climate) and role thereof remain unanswered. Although team sport skills have been targeted as the review shows (31%), said skills would have been employed outside normal team sport settings (e.g., goal kick outside of actual training). As well, limited competition settings employed in prevailing research mean that even where research targeted skills in team sport, chances are the context was not fully reflective on team sport contexts. More research targeting individual sport would seem to suggest that more is understood about self-talk use in individual sport, however, given that few individual sports have been targeted (e.g., athletics, swimming, and cycling), more remains unknown. A recent study (Nedergaard et al., 2021) found differences in self-talk content between badminton and runners. Precisely, badminton athletes reported self-talk that reflected worry and efforts to contain anxiety whereas runners' self-talk reflected task detachment. The study went further and assessed differences in self-talk use between high and low intensity among runners. Nedergaard and associates (2021) reported high prevalence of shortened, positive, and repetitive self-talk when runners were not pushing themselves, yielding slower running time. As it is, although individual sport has been targeted more, the complexity of sport context is yet to be understood. Hints to differences in self-talk effects depending on task at hand are not new.



Another important contextual trend reported in the study is the fact that self-talk intervention studies have predominantly been conducted in western societies. Although it is commonly argued that research has focused on WEIRD populations, previous reviews have not highlighted elements of this fact. Yet given proposed personal self-talk antecedents (Hardy et al., 2009) and cultural influences (e.g., Peters and Williams, 2006; Van Raalte et al., 2016), the fact that over 80% of studies utilized reasonably educated, English speaking, and independent respondents mean that practitioners in different context may not be confident about self-talk efficacy in different populations. The findings could mean that in contexts not studied before, cultural variables may interact with sport type and render the intervention complex. This remains unknown. Indeed, the findings reflect the bias nature of the exclusion criteria where English language as a criterion ensured that research published in other languages were excluded.

Without intervention implementation, design and context variables cannot be tested. Even then, there are variances within interventions, including the presence or absence of self-talk rehearsal, duration of the intervention and testing. Generally, interventions have employed (e.g., De Matois et al., 2020; Wallace et al., 2017) or not employed (Agdasi & Toubia, 2015; Wright et al., 2016) self-talk practice and given reports of improved performance. However, Hatzigeorgiadis and associates' (2011) synthesis evidenced greater effect for the moderating effect of self-talk training, while noting meaningful effects for studies which did not employ self-talk rehearsal. Alongside self-talk rehearsal in self-talk implementation is the component of intervention duration. Previous reviews (e.g., Tod et al., 2011) have not indicated trends regarding intervention duration. Indeed, Hatzigeorgiadis and colleagues (2011) noted data limitations as a hindrance to testing duration as a continuous moderator, even as they noted higher effects in interventions employing longer training and intervention duration. It is not clear what classified as longer training and duration. Currently,

the review found that research predominantly utilize interventions that last a shorter time (up to two weeks). Still, interventions lasting longer (e.g., Cooper et al., 2020; DeWolfe et al., 2020, Walters et al., 2019) are also used, with reported positive outcomes.

The findings have significance for ongoing self-talk interventions which to now have mainly focused on design, context and implementation components in isolation. Research scrutinizing interactions within and between design, setting, and intervention components is wanting. Noting Hardy and colleagues' (2009) call for research to shift focus to also investigate moderating and mediating variables, existing review studies made efforts (Hatzigeorgiadis et al., 2011; Tod et al., 2011). Several studies have gone on to investigate the mediating role of cognitive mechanisms such as attentional focus (e.g., Galanis et al., 2018; Zetou et al., 2014) and motivational self-talk such as self-efficacy (e.g., McCormick et al., 2018; Wright et al., 2016) with results pointing to said variables as mediators in the self-talk and sport performance. Although the matching hypothesis proposition was made two decades back (Theodorakis et al., 2000), and documented support thereof was reported (Hatzigeorgiadis et al., 2011), pointing to self-talk functions attending to motor tasks differently, investigations on the possible interaction between type of self-talk and task demand is yet to be conducted. Reported trends in self-talk and sport research indicate that over time, studies have used some design, context, and implementation components more than others. That said, findings do show that even for variables that have been targeted less (e.g., competitive settings, longer duration, and novel tasks), there is increase. There is abounding self-talk interventions research on sport performance, yet we are yet to understand complexities of said interventions. Insights on interactions within and between design, context, and implementation will enable higher chances of intervention efficacy. Besides, knowing what conditions (design) work under which contexts and how to implement such

may lead to more research targeting overall performance and competitive contexts, for example.

There are limitations to the present study. First, the language exclusion criteria may have left out studies that would have added to current findings. Secondly, lack of research on self-talk interventions complexity meant that analysis of said complexity was not possible. Trends reported currently, in previous reviews, and continuing research, which utilized varying design, context, and implementation variables and yielding desirable outcomes point to possible interactions between components. Future research would do well to investigate interactions between variables commonly included in intervention design, context, and implementation.

Overall, the current study has paved the way for the overall dissertation in several ways. Research remains wanting in targeting combat sport, competitive conditions, non-WEIRD populations, and in employing single subject designs despite reported large effects (Hatzigeorgiadis et al., 2011), collaboration during cues selection. A focus on WEIRD populations renders the general understanding of self-talk in other populations, including Botswana, limited if at all known.

## **CHAPTER 4**

### **Self-Talk Awareness, Beliefs, and Use among Batswana Boxing Athletes: Retrospective**

#### **Recall**

##### **4.1 Introduction**

The preceding systematic review findings indicate sustained interest on self-talk use in different sporting activities, evident in the increase in self-talk and sport performance research. Experimental (e.g., Cooper et al., 2020; Galanis et al., 2018; Hardy, Thomas & Blanchfield, 2019; Hase et al., 2019; Hatzigeorgiadis et al., 2011; Hong et al., 2020), qualitative (e.g., Hardy et al., 2001; Latinjak et al., 2018; Latinjak et al., 2019; Miles & Neil, 2013), and quantitative (e.g., Hardy et al., 2005; Park et al., 2020; Thibodeaux & Winsler, 2020; Van Dyke et al., 2018) studies suggest that athletes use self-talk of varying content or function (e.g., Motivational and instructional self-talk) and valence (e.g., positive, negative, and neutral). Existing models of self-talk also suggest that self-talk serves instructional and motivational functions (e.g., Hardy et al., 2009), and is positive or negative in valence (e.g., Van Raalte et al., 2016). Moreover, early descriptive studies found that athletes and exercisers used self-talk for reasons classified as cognitive, motivational (Gammage et al., 2001; Hardy et al., 2001), and miscellaneous (Hardy et al., 2001).

Early retrospective recall studies examined the where, when, what, and why (four Ws) of self-talk use among exercisers (Gammage et al., 2001) and athletes (Hardy et al., 2001). In both studies individuals (exercisers and athletes) reported using self-talk mostly during sporting activities. The studies generally found similar themes extracted from questions pertaining to each of the four Ws, Findings indicated self-talk characteristics (e.g., structure, nature, and person) and purpose (e.g., motivation and cognitive functions). Further, both exercisers and athletes used phrases more than cue words and sentences, and used self-talk

for similar motivation (e.g., mastery, arousal, and drive) and cognitive (e.g., skill specific and general) purposes. The studies however, differed in the nature (valence) of self-talk reported. Whereas Gammage and associates (2001) reported negative self-talk use Hardy and colleagues (2001) indicated perspective self-talk alongside positive and negative self-talk. The two studies provided a basis for coding schemes future research could use, paved the way for development of self-talk theory, and provided ground for a conversation on self-talk functions rather than a focus on self-talk content (Gammage et al., 2001; Hardy et al., 2001). Had the findings been intended to inform a self-talk intervention for individual athletes in the study, insights gained regarding individual athletes' self-talk use and needs, they would have been invaluable.

Hinged on early but limited research Hardy and associates' (2009) framework for the study of self-talk submits that several factors, termed self-talk antecedents, potentially influence athletes' self-talk use. Self-talk antecedents have been classified as personal and situational antecedents, with the former comprising cognitive processing preferences, belief in self-talk, and personality types. Situational antecedents on the other hand include task difficulty, match circumstances, coaching behaviors, and competitive setting. Beyond self-talk antecedents the Hardy and colleagues' (2009) framework suggests several underpinning mechanisms, factors which possibly explain the impact of self-talk on sports performance: cognitive mechanisms, behavioural mechanisms, motivational mechanisms, and affectual mechanisms. Numerous investigations have since shown that concentration (e.g., Galanis et al., 2018; Zetou et al., 2014a) self-efficacy (e.g., Ay et al., 2013; Wright et al., 2016), motivation (e.g., Zetou et al., 2014a), confidence (Van Raalte et al., 2018), and anxiety (e.g., Hatzigeorgiadis et al., 2009) are likely mediums through which self-talk influences performance. Recently, Van Raalte et al. (2016) proposed the sport-specific self-talk model,

also suggests the influence of personal, contextual, motivational, and behavioral factors on the self-talk and sports performance relationship.

The preceding systematic review examined trends in prevailing self-talk and sport performance. Further, the review scrutinized complexities in self-talk interventions design, context, and implementation. The review study found that prevailing self-talk research has equally targeted male and female participants and utilised self-talk practice and no practice equally. The review also found that self-talk research has mostly utilised student participants, targeted accuracy tasks, used instructional self-talk, assigned self-talk to participants, used interventions with short duration (once or 1 day) in training conditions, targeted individual sport, and populations in the west. Although research has targeted more individual than group sport, findings from the preceding chapter show that less than 1% of self-talk research targeted combat sport. Even then, the sport of boxing is yet to be studied. The review further showed that existing self-talk use studies predominantly targeted athletes from Western backgrounds rather than being multicultural. The present study thus focused on gaps relating to limited studies targeting non-WEIRD populations and combat sport.

By far, current self-talk usage findings remain applicable and possibly more meaningful to athletes from the west. Despite hints that culture and/or ethnicity (e.g., Peters and Williams, 2006; Van Raalte et al., 2016) potentially influence self-talk use, other than Adeyeye and colleagues' (2013) study, the prevailing literature on self-talk use in sport has not employed populations in Africa. Since Adeyeye and associates' (2013) study employed four athletes, it is far from representative of self-talk use among athletes in the African context and is limited in giving insight on the same. Self-talk use research among Batswana in any field is non-existent. Assuming that culture and ethnicity are influential on self-talk use (e.g., Peters and Williams, 2006; Van Raalte et al., 2016), exploring self-talk use among

Batswana athletes is necessary. Before formulating a tailored skill targeted self-talk intervention for Batswana boxers, an understanding of participating boxers' self-talk use, awareness of use, beliefs regarding self-talk, and perceived benefits is paramount. Besides, to my knowledge, no documented self-talk research has comprised boxing athletes. Therefore, although research (e.g., Hatzigeorgiadis et al., 2011; chapter 3) indicates the use of self-talk among athletes from a wide range of sports, including some combat sports (e.g., Hanshaw and Sukal, 2016; Slimani & Chour, 2016; Zetou et al., 2014b), suggestions of the same cannot be confidently extended to boxing.

Accordingly, investigating self-talk use among boxing athletes remains important, particularly because boxing is reportedly the most difficult of all sports based on performance on athleticism variables such as endurance, strength, power, speed, agility, flexibility, hand-eye coordination, nerve, durability, and analytic aptitude (ESPN, 2010; Total Sportek, 2016). Decisions on research aim, objectives, and therefore questions considered the study novelty in the two contexts - sport and population targeted, and the positioning of the study in the thesis. Consequently, given novelty of the study contexts (type of sport and population) and the formative positioning of the study, a comprehensive exploration of participants' self-talk use, including awareness and beliefs was necessary. This would allow for an athlete informed approach to intervention development and implementation. Self-talk use awareness was deemed worthy of including in the exploration because although research on athletes' self-talk use awareness has not been direct, there are suggestions that self-talk can be spontaneous (intuitive) and strategic (intentional). Discussions therefore imply that individuals may use self-talk in the spare of the moment, fueled by emotions or circumstances, and therefore unaware of self-talk usage. Also individuals may use self-talk strategically to achieve set performance related goals (e.g., Latinjak et al., 2019; Van Raalte et al., 2016).

Consequently, in general, the current study aimed to investigate Batswana boxers' self-talk use in boxing settings. Five objectives guided the aim of the study. Firstly, the study sought to establish Batswana boxers' self-talk use, awareness, and beliefs. Secondly, the study endeavoured to establish settings in which Batswana boxers use self-talk. Thirdly, the study sought to investigate Batswana boxers' self-talk content across boxing settings. Moreover, the present study endeavoured to explore ways in which Batswana boxing athletes use self-talk. In addition, the study aspired to identify factors that influence Batswana boxers' self-talk use. Finally, the study sought to determine the uses of Batswana boxing athletes' self-talk.

Eight questions facilitated the study:

1. Do Batswana boxers use self-talk?
2. Are Batswana boxing athletes aware of their self-talk use?
3. Do Batswana boxers believe their self-talk and what reasons do they give for believing their self-talk?
4. In what settings do Batswana boxers use self-talk?
5. What types of self-talk do Batswana boxers use?
6. In what ways do Batswana boxing athletes utilise self-talk?
7. What factors influence Batswana boxing athletes' self-talk?
8. What uses do Batswana boxers assign to self-talk?



The general value of the current study is in its potential to provide ground-breaking insights into Batswana boxing athletes' self-talk use across boxing settings. Specifically, the study is formative in the PhD project, it will inform subsequent studies including Batswana boxing athletes' real-time self-talk use and a tailored skill-targeted self-talk intervention for participating boxers.

## **4.2 Method**

### ***4.2.1 Research design***

The current study employed a realist approach, the view that a real world exists and can be explored, understood, and expounded upon (Patton, 2015). From that standpoint, ideas, thoughts, explanations, and intentions are considered real, although they cannot be directly observed **or** described (Maxwell, 2012). Accordingly, the present study embraced the view that the words and views of participating boxing athletes, their self-talk, are their truth. Analysis and meaning making of the data thus focused on participants' truths (Keller, 2002; Maxwell, 2012) in specified contexts (Patton, 2015). The approach gives participants' voices center stage (Van, 2011), and the researcher's self-awareness is essential for accurate reporting of participants' self-talk and interpretations thereof (Maxwell, 2012). The interview approach was deemed fitting for this exploratory study to allow an extract of participating boxers' self-talk use from their perspective.

Existing experimental self-talk research mostly assigns participants self-talk cues and phrases (e.g., Abdoli et al., 2018; Wright et al., 2016). In other studies, participants had the liberty to select cues, however, from assigned lists (e.g., Hartzigeorgiadis et al., 2018; Hanshaw and Sukal, 2016). In a few studies, athletes purely selected their own self-talk (e.g., McComick et al., 2018; Wallace et al., 2016). Perhaps the significance of self-selection has not received much attention to date because interventions have yielded beneficial effects on

performance regardless of cue selection (Hatzigeorgiadis et al., 2011). Yet, it is necessary to bear in mind that the bulk of studies in the meta-analyses (Hatzigeorgiadis et al., 2011) were not conducted in real life and used WEIRD populations. When considering a tailored skill-targeted self-talk intervention in the real world, the possibility of individual preferences in cue selection needs attention, more so when investigating a population not studied before. Where intervention recipients may prefer choosing from an assigned list, there is a chance that the self-talk cues can be more believable and/or be a better fit when selected from a list extracted from the recipient's self-generated list. Where self-selected cues are modified with the help of the practitioner or coach to enhance effectiveness, such modification may serve the purpose better when founded on and informed by a rich understanding of individual recipients' self-talk use. The interview approach is considered the most suitable for exploring self-talk related information and extracting self-talk cues and phrases. Interviews can spearhead a self-talk needs assessment for individual athletes prior to the anticipated tailored skill-targeted self-talk intervention.

Regardless of whether the athlete is in an individual or team sport, sport performance is an individual activity. For that reason, using self-talk interventions to improve individual athletes' performance necessitates tailored interventions. Borrowing from clinical setting approaches, tailored interventions need to pivot from an in-depth understanding of the intervention recipients' needs, challenges, and strengths, as individuals. In clinical settings, this process is usually characterised by intake interviews. In mental health clinical settings, initial interviews are often structured using interview protocols such as the Diagnostic Interview for Anxiety, Mood, and OCD and Related Neuropsychiatric Disorders (DIAMOND) (Tolin et al., 2016) and the Structured Clinical Interview for DSM-5R Personality Disorders (SCID-5-PD) (First et al., 2015), for diagnostic purposes. In clinical or counselling psychology practice, for instance, structured interview protocols do not substitute

the use of semi-structured interviewing. Semi-structured interviews are at the heart of providing psychological interventions. In the present study, semi-structured interviews will facilitate in depth self-talk needs analysis from which the practitioner can know and understand individual recipients' self-talk needs and strengths, and then consider the best ways to intervene. The current study will therefore employ semi-structured interviews to explore participating boxing athletes' self-talk awareness, beliefs, and uses.

#### **4.2.2 *Participants***

Seventeen participants from four boxing clubs in Gaborone took part in the current study, 14 males and 3 females. All participants had 12 years of basic education, with eleven in full-time tertiary education, three in full-time employment, and four unemployed. The student participants were from a variety of academic disciplines, including humanities, business, engineering, education, and science. Participants' competition level experience included local (inter-club and national) and international (regional and continental) competitions. To ensure anonymity, information indicating the number of participants per specific competition experience level, age range per sex, and weight category per sex is excluded. Table 5 below presents a demographics summary.

**Table 5**

*Summary of Demographics Information*

<b>Demographic Variables</b>	<b>Lowest</b>	<b>Highest</b>	<b>Means</b>	<b>Standard Deviation</b>
Weight (kg)	48	69	58.23	6.40
Boxing Experience (years)	1.6	9	4.99	2.31
Competition Experience (years months)	.10	7.5	4.08	2.45
Age	18	26	22.74	2.27
Duration with club/coach (years/months)	.1	7	3.04	2.19

**4.2.3 Measures**

**Recording Devices.** The recording equipment comprised a Zoom H5 Handy Recorder, a Skype VodBurner (Version 1.1.0.201) video recorder, and a Samsung Galaxy A5 phone.

**The Interview Guide** The interview questions were developed for the purpose of the study, guided by Gammage et al.'s (2001) study. The guide comprised a statement introducing the interview session:

During the next hour, I will ask you to reflect on your boxing training and competition moments. I will ask you questions regarding your thoughts during the different moments of training and competition. I will spend most of the time asking you to reflect on your warm-up, shadow boxing, punch bag and sparring sessions. Towards the end, I will ask you to reflect on your bouts (competitions). However, we do not have to follow this order.

The statement introducing the interview session is followed by five precise instructions. The interview guide then asks questions relating to demographic information such as age, boxing experience, boxing competition experience, weight category and education level. The structure and questions of the main segment of the interview guide pivoted from the Gammage and colleagues (2001) study. Their description of exercise-related self-talk and open-ended questions informed the current approach interview questions such that the open-ended questions invited participants to share what they say to themselves during specified training contexts and in competition. That said, the current study's interview questions went beyond Gammage and associates' (2001) study to ask about self-talk awareness, usefulness, and beliefs in self-talk. The full interview guide is included in Appendices.

#### **4.2.4 Procedure**

**Gaining Entry and Recruitment.** Botswana's Ministry of Youth, Sport and Culture granted permission to conduct the study following the University of Botswana (UB) Research Ethics Office's recommendation. In addition, the Botswana Boxing Association (BoBA)

permitted the research activities. A purposive sampling method was employed in that the study targeted boxing athletes. Participants' inclusion was guided by four conditions:

a) Botswana citizen boxing athletes based in Gaborone, Botswana, b) between the ages of 18 and 26 years old, c) with at least 12 months of boxing experience, d) at least one inter-club competition experience, and e) the willingness to participate in the study. Having read the information sheet (Appendix P), participants formally consented to take part in the present study (Appendix P). Additionally, following a verbal explanation of the current study's purpose, procedures, and participants' rights, participating boxers gave further verbal consent at the start of the interview.

**Rapport Building.** Prior to undertaking my PhD studies, I volunteered administratively and/or as a psychologist at the club and national team levels for a total of 20 months. My roles included facilitating travel and accommodation arrangements for the University of Botswana boxing club, and accompanying teams to local, regional, and continental competitions as the team psychologist. I had interacted with each of the athletes who volunteered for the study at some point during my 20 months of volunteerism. As such, the athletes and the gatekeepers knew me prior to the study.

**Pilot Interviews.** A Skype video call using VodBurner (Version 1.1.0.201) was used during the interview questions piloting phase. The interview guide asked participants to share thoughts that they usually think at the beginning and during specific training and competition components. Nine questions tailored for this study guided the interview. For instance, "Do your best to remember what you usually say to yourself at the beginning and during punch bag sessions. Please share those thoughts". Probing questions included scaling questions meant to shed more light on self-talk use, awareness, usefulness, and beliefs. For instance, "How helpful are your thoughts, out of 10?"

**Study Interviews.** After a brief explanation of the study, its purpose, and the individual participants' right to terminate the interview without explanation, the participants signed two copies of the consent form. One copy was for my records while they retained the other copy. I informed participants that they could use either Tswana, English, or a blend of the two languages. Each participant was interviewed at a time and setting convenient to them, which included Skype video, an office, a car, a minibus, and under a tree.

Nine face-to-face interviews took place in an office, three in a car during participants' tea or lunch breaks at their workplaces, two interviews at a competition venue in a minibus and under a tree, and three interviews via Skype. For safeguarding purposes, participants' right to terminate the interview was emphasised at the beginning of the interviews, even more for those interviewed in my car. The interviews were recorded using either a Samsung A5 phone, a Zoom H5 Handy Recorder, or a Skype VodBurner (Version 1.1.0.201) video recorder. On average, the interviews lasted 30 minutes in duration, and were completed in three months. Participants interchanged the English and Tswana languages throughout the interviews.

**Interviews transcription.** I transcribed the interviews in English, helped by three research assistants fluent in both Tswana and English. I carried out translation accuracy checks for three of the six transcripts (selected at random) translated by the research assistants. One of the research assistants checked the accuracy of the translation in four of the interviews I transcribed. Translation checks focused on content translation accuracy rather than word similarities, allowing synonym differences. I contacted participants through face-to-face, WhatsApp, or phone calls whenever clarification or additional information (e.g.,

demographic information verification, reasons for belief in self-talk, self-talk awareness) was necessary.

**Participants' Anonymity.** I took several measures to heighten anonymity. Firstly, pseudonyms are used, excluding feminine names, given the few female participants. The small number of participants in the study meant that there were even fewer participants per weight category, boxing experience, competition experience, and age. Therefore, weight category, boxing experience, competition level, and age are reported as a range to ensure anonymity. Moreover, the age range is not specified for males and females because there were very few female participants.

#### **4.2.5 Data Analysis**

Two interview transcripts were excluded from the analysis because the content thereof described boxing experiences in general and not self-talk use. Consequently, 15 out of 17 transcripts were analysed. The analysis employed a thematic data analysis process (Braun & Clarke, 2006; Clarke & Braun, 2013). Guided by research questions, I went through individual narratives and extracted specific questions fitting the self-talk use, awareness and belief in self-talk general questions, and responses thereof. For example, the question "are boxers aware that they talk to themselves?" in one column is accompanied by a column entailing athletes' responses relating to that question. The current analysis did not base theme (general or specific) development on prevalence. Therefore, some themes comprise very few units. In addition, the analysis did not focus on the number of participants using specific units given that the study is not about generalisation but exploring self-talk use by individuals for intervention purposes. As a result, the themes for this analysis are determined by their relevance to the research question(s).



I immersed myself in the data for in-depth familiarity and appreciation of athletes' accounts by repeatedly listening to the recordings and/or concurrently reading the transcripts. This activity, besides augmenting familiarisation gained during the transcribing and translation checks, the step was indispensable in safeguarding transcription quality in terms of a suitable degree of detail and accuracy (Braun & Clarke, 2006; 2013). All 15 data items were afforded equity in terms of attention during the coding process, such that transcript extracts (for each participant) pertinent to the research questions (Braun & Clarke, 2006:13) were transferred into a table. It was at this stage that two of the seventeen transcripts were omitted from the analysis. The coding process focused on: (i) self-talk use; (ii) when self-talk was used; (iii) what self-talk was used; (iv) the context in which self-talk was used; and (v) the purpose and value of self-talk. Research questions and existing descriptive self-talk literature (e.g., Gammage et al., 2001; Hardy et al., 2001) guided the coding process.

Coded data extracts were then organised into general themes (Braun & Clarke, 2006) comprising context, content precursors, and uses. Although the themes were generated from the data set, theme names were influenced and refined by early descriptive self-talk literature (Hardy et al., 2001; Gammage et al., 2001) and the framework for the study of self-talk in sport (Hardy et al., 2009). At this phase, tables of each general theme were developed, ensuring sub-themes were developed, i) and extracts from the transcripts transferred into the tables accordingly. Additionally, this process entailed going back and forth within and between themes, ascertaining the suitability of extracted data for given themes, ii) coherence, consistency, and distinctiveness of extracts for given themes, iii) eligibility of some extracts under more than one theme. Thereafter, themes were given descriptions fitting of their data set extracts leading to an analysis, which seeks to give meaning to participating athletes' self-talk stories (Braun & Clarke, 2006). The data analysis

process was not a one-direction process, the researcher when back and forth between phases.

This process is summarised in Table 6 below.

**Table 6**

*Phases of Thematic Analysis*

<b>Phase</b>	<b>Description of the Process</b>
1. Data familiarisation	Listening to the recording, data transcription, reading and rereading data sets.
2. Generating initial codes	Systematically coding attention-grabbing components of the data for each data set, organising data pertinent to each code.
3. Searching for themes	Organising coded data into likely themes, assembling all data pertinent to suggested themes.
4. Reviewing themes	Ascertaining that identified themes depict the assembled codes and the data set as a whole.
5. Defining and naming themes	Continuing scrutiny to hone specifics of respective themes, and the whole story conveyed by the analysis.
6. Producing the report	Selection of persuasive examples, final scrutiny of selected excerpts, linking the analysis to the study questions and literature, report writing.

#### **4.2.6 Research Credibility**

To ensure credibility, the current study considered the eight criteria for excellent qualitative research (Tracy, 2010, p. 840). Appendix A demonstrates the eight standards are demonstrated.

### **4.3 Results**

Research questions guided the presentation structure of the results. Therefore, results are presented in the order of research questions.

#### **1. Do Batswana boxing athletes use self-talk?**

Batswana boxing athletes' responses to specific questions regarding whether they talk to themselves during boxing activities, what would be captured if a recorder was implanted in their heads during boxing tasks, and what they think during boxing-related activities revealed self-talk use. Some of the responses also gave an indication of the extent to which the boxers use self-talk during boxing activities. Table 7 below highlights responses indicating self-talk use among participating boxers.

**Table 7**

*Self-Talk Use Evidence*

Responses Sample
- “I <u>always</u> say things to myself when I am training”
- “I talk to myself <u>all the time</u> .”
- “I say things to myself during training and after...”
- “What you will hear is...’
- “I don’t know what you will hear, I don’t know how to put it but there are things I am thinking.”
- “When I start training every day I always think...”
- “Yeah sometimes, sometimes I do, sometimes I tell myself...”
- “...most of the times it is self-talk.”
- “I say things to myself every day... ”

**2. Are Batswana boxers aware of their self-talk use?**

Although all boxing participants reported using self-talk, most indicated that they were not aware that they used self-talk. Upon probing boxers regarding self-talk use awareness, most participants reported that they were not aware of their self-talk use until they participated in the study interviews. The few participants who indicated self-talk awareness

revealed that they had been aware of their self-talk use prior to participating in the study.

Table 8 below depicts sample responses related to self-talk use awareness.

**Table 8**

*Self-Talk Use Awareness Responses*

Response Sample
- “I wasn’t aware I would say.”
- “Well, I can say I used self-talk but I wasn’t aware of it until we talked about it then I realised that I have been doing it before.”
- “I don’t think I knew I used it.”
- “Yes I am [aware] all the time.”
- “Before research I did not realise that self-talk can work for me, I wasn’t aware of it.”
- “Yeah most of the time I am [aware]”
- “To me I have been talking to myself, I talk to myself about many thing, even at school, I remember in form 5, I did say things to myself to motivate myself to do that particular thing ahead of my duty. It is something that I have always done so when I came to boxing I did it automatically.”

### 3. Do Batswana Boxing athletes believe their self-talk?

Other than participating boxing athletes' reports of self-talk use, responses to questions inquiring about belief in self-talk revealed that almost all participants believe their self-talk. Some responses even gave indications of the extent of belief. Table 9 below illustrates responses related to belief in self-talk. Moreover, participants not only reported belief in self-talk but also stated reasons why they believed their self-talk. The reasons they specified included motivational, technical, tactical, and concentration benefits. Reasons for belief in self-talk overlapped with self-talk uses. Therefore, reasons for belief in self-talk are incorporated into the self-talk uses section.

**Table 9**

*Belief in Self-talk Responses*

Responses Sample
- "I believe them <u>fully, 100%</u> ."
- "...even if I lose, I still believe them."
- "Ah, I believe in them ma'am, <u>very much, 8/10</u> ."
- "Yes, I believe them."
- "I believe those self-talks."
- "For me it's <u>50:50</u> really, some I do [believe], some I don't."

#### 4. In what settings do Batswana boxers use self-talk?

The context theme encompasses *where* and *when* self-talk athletes used self-talk. Specifically, the *where* encompasses training and competition contexts, whereas the *when* refers to specific training (e.g., pre-training, warm-up, shadow boxing, punch bag, sparring, and general training) and competition (e.g., warm-up and bouts) settings. The context in which participating boxers reported self-talk use and the degree of use in each setting is shown in Appendix B. Examples of quotes indicating self-talk use in different settings are shared below in the order: pre-training, warm-up, shadow boxing, punch bag, sparring, and bout:

*I would be like, 'Bangu you are going for training, you are going to enjoy training, you are going to learn and learn, and you are going to improve your skills and your fitness' (Bangu).*

*Honestly, it [what goes on in my head during warm up] is, 'here I am again, oh it's gonna hurt, oh no, I am gonna get beaten today, heish! ahh! I wanna go home, oh my gosh! Do I really wanna be here right now? Eish! I wonder what X is doing...agg! Imagine we had this free time to do something together, like other people, you know, like normal people, ah! Ok no, stop it! Do the work...do it, do it' then I keep doing warm up, and if I don't feel warmed up I say, 'I don't feel warmed up, continue while others are doing special, keep going, keep going,' and then I can become absent minded and not think... (Laone).*

*In shadow boxing it is self-talk I would say because there you fight an opponent that is not there so you can't just throw punches without even telling yourself that 'this person is moving to this side, I should cover them on this side, move to the other side,' so that I can counter that person and attack. 'No, that person is attacking me, no I*



*have to move back and forth, ' so with shadow boxing most of the times it is self-talk'*  
(Aone).

*(Laughs) It's funny because I'll be like, when I get to the punching bag and I feel tired I would be like, 'can I be made tired by something which doesn't see me? It can't think! Why? You can do this, you have to do this, you can beat this punching bag.' I think of some things, that "punching bag is there, it is you who is working on it, why not work?" and then it makes me punch like that (laughs) (Bangu).*

*Sparring is more or less like the bag. In round one I'll try as much to preserve energy but at the same time try to show case the technique we are taught all the time in the gym. So I will try to say to myself, 'first thing I need to do is establish my jab and see how my opponent reacts, and then from there see what type of combinations I can throw, what I can do to win the contest' (Larona).*

*In competitions I have different thoughts, that is, every competition has its thoughts, they are never the same. If I have a tournament today next time I try to do something better, maybe today I wasn't attacking, tomorrow I will be attacking. It will be my number one thought to 'attack, attack!' Maybe today I wasn't using my left hand more, tomorrow I will be saying 'use your left hand more' or maybe next tournament I will be saying 'work like an aeroplane, like a jet, starting off from low...' (Sylvester).*

## **5. What self-talk do Batswana boxers use?**

The self-talk content theme depicts self-talk that participating boxers reportedly used. Self-talk content was categorised into two groups: function and valence, based on existing self-talk literature (e.g., Hatzigeorgiadis et al., 2011). Self-talk function category, which describes the purpose served by specific self-talk, was further classified into two

categories: motivational and instructional functions. Motivational self-talk function encompasses self-directed statements intended to make one ready, amplify effort, and heighten confidence. Instructional self-talk function, on the other hand, comprises self-statements meant to direct attention or ensure focus on the technique or strategy to be used (Hatzigeorgiadis et al., 2011). Self-talk valence category, which describes the nature of self-talk content, was further categorised into three groups: positive, negative, and neutral self-talk. Positive valence theme encompasses self-talk cues, phrases, or sentences that have a constructive or helpful tone. Negative valence category comprises self-talk cues, phrases, and sentences that sound unconstructive and/or signal adverse or undesirable emotions such as disappointment, annoyance, doubt, or impatience. Neutral valence theme, therefore, encompasses self-talk phrases and statements that are not necessarily helpful nor unhelpful in tone (Van Raalte et al., 2016). Table in Appendix C describes the degree to which boxers used the five distinct self-talk types in specified boxing settings. Below are examples of motivational, instructional, positive, negative, and neutral self-talk, respectively:

*“You can do this, you got this!” (Aone)*

*“Move both sides, to the left.” (Noel)*

*“I want to win.” (Bangu)*

*“Eish! I’m really tired.” (Laone)*

*“If he does this, what can I do to him?” (Mokwena)*

## **6. In what ways do Batswana boxing athletes use self-talk?**

Analysis of athletes’ self-talk revealed self-talk that differed in structure and the person referenced. Self-talk structure theme was further categorised into cue words, phrases, sentences, and questions, according to distinct training and competition settings. The analysis

revealed differences in the frequency of self-talk cue words, phrases, sentences, and questions. Generally, athletes reported the use of sentences strikingly more than they used cue words, sentences, and questions. Although overall, athletes used sentences in training more than in competition, when considering the duration of competition (short) versus training (long), there was more use of sentences during the short duration of competition than in training. Table in Appendix D depicts the degree of self-talk cues, words, phrases, sentences, and questions used in training and competition settings.

## **7. What factors influence Batswana boxing athletes' self-talk?**

The self-talk influence theme relates to reported factors that preceded participating boxers' self-talk use. Interview conversations with participating boxing athletes hinted at several factors preceding their self-talk, which Hardy et al.'s (2009) framework for the study of self-talk termed antecedents. Although in some instances, influential factors were indicated in response to specific follow up questions, in most cases, antecedents (e.g., what, who, and where) were stated without any probing. Athletes did not merely list their self-talk, rather, they shared the background relating to *what* would be happening *within them, to them, or around them* before specifying self-talk cue words, phrases, sentences, or questions. Consequently, factors preceding athletes' self-talk were analysed in relation to the individual, yielding two overarching themes: personal and situational factors in alignment with Hardy et al.'s (2009) framework.

Personal variables related to participants' cognitive, physical, or emotional characteristics are directly or indirectly implicated as reportedly preceding ensuing self-talk. Personal antecedents comprised emotions, belief in self-talk, and fitness, with emotions as the more prevalent personal factor. Emotion sub-theme further yielded two sub-themes: tiredness and other emotions. Tiredness was a standalone sub-theme because it was

much more commonly reported than other distinct emotions. Situational factors encompass variables exterior to the athlete, which were directly or indirectly noted as preceding the boxers' self-talk cues words, phrases, sentences, or questions. Situational antecedent sub-themes include significant other and competition influences. Significant other sub-theme further yielded two sub-subthemes, namely coaches and teammates.

Competition influences sub-theme was further grouped into three sub-subthemes, being opponent, bout progress, and competition, with the opponent sub-subtheme more prominent than other situational factor sub-subthemes. Table shown in Appendix E reflects the extent to which primary and secondary personal and situational factors were reported by participating boxers. Quotes demonstrating personal and situational sub-categories are shared below:

Tiredness:

*When you start ...you are not tired so you tell yourself, "I got this!" but as time goes you are tired and when you get tired that's when you need your mind. You need to start telling yourself that "I am not tired, I can do this, I can push myself, I can put strong." (Aone)*

*When I get to the punching bag and I feel tired I would be like, "can I be made tired by something which doesn't see me? It can't think. Why? You can do this, you have to do this, you can beat this punching bag." I think of some things, that "punching bag is there, it is you who is working on it, why not work?" and then it makes me punch like that (laughs). (Bangu)*

Other emotions:

*I think I am a very moody person. It can be that in the morning when I wake up I say, "oh today, the gym, I am so motivated, today I want to do this, I wanna do this and*

*this”, but then as the day progresses something switches in me, it just changes. I get to the gym and I start, “agg! I don’t want to go, this is hard, I don’t want to be here.” Then other days I can start the same way, just being low, “eish, I just don’t want to do it today, what am I doing today, why do I have to get out of bed, I don’t want to do that.” But then when I get to the gym I am just there on the bag, going harder and harder such that I can feel that I am really working, “yeah, go, keep going, keep going”, like I said it just goes by my moods, something can just switch me off...one little thing and it’s done. (Laone)*

*Even though I feel beaten I would still fight and tell myself to at least finish the rounds. This is me learning and it doesn’t matter whether I get hit and then I lose focus and I get angry because I feel that the person am fighting is not fighting fairly or is using more power than I am and stuff like that so I still take that am learning and take it as a learning curve. (Thabiso)*

#### **Belief in self-talk:**

*I believe my self-talk very much because I believe that what I am thinking, say if I say, “uppercuts, uppercuts, in fight” it is because I believe that in fight will work for me or that my uppercuts will work for me, you see. That is, what I say is what I believe will work for me, I would not say anything that doesn’t work for me, you see. Like if I say, “jab, jab, stay outside, stay outside, jab, jab-jab, use a jab Kagiso, use a jab,” I know that I want to stay outside, I avoid his punches using a jab, yeah! (Kagiso)*

*For me it’s 50/50 really, some I do [believe] some I don’t, like the more instructive self-talk like punch, move, duck, do this, attack, those ones work, but then the motivational ones like, “you are a good boxer, you’ve got this, you are confident, you are fit,” they are a little bit harder to believe. Sometimes I do, [believe them]*

*sometimes I don't, like one time before I went into a fight I told myself that, "you know what, you are a good boxer," and then when I got in the ring I actually saw myself doing well. Then other times even when I tell myself that, "you've got this, you are in control, you are doing ok." It's very very hard to believe them... (Laone).*

#### Fitness:

*...but if I get there, imagine my training and I didn't do well in training, there is nothing, when I see my training being low, having not done circuit 1, or having been unfit during circuit 1, falling behind others, them overtaking me many times, it also has an effect. I would say, "ah, I haven't been doing anything at training." (Bangu)*

*When you don't know the opponent, personally for me if I don't know the opponent I look at how I have been training and say, 'I have been training hard, training has been going well, no injuries, no what what,' so I feel that I am perfect. It means that I am going to go for it we will see, I never hesitate and say, "no, I doubt myself" no! When I have trained, I can feel that I am perfect, I just go, I don't doubt anything, yah! (Masego).*

#### Coaches' influence:

*In Round 1 what I will be thinking is that I need to preserve energy for round 3 because it can be that by round 3 I am tired and the coach can get angry and I want to avoid the whole situation, so round 1 I take it easy trying to reserve energy for round 3. I usually say things like, "maybe punch one or two combinations, keep moving, punch maybe a maximum of 3 combinations, don't go all out." (Larona)*

*There are some coaches that when you are doing they keep saying, 'come on Laone, do this, do this,' it annoys me, another coach does it, I don't know why I would feel really demotivated. For example, when usually coach X would come and say, come*

*on, keep going, keep pushing, ' I would feel so motivated I would be like, "you can do this, come on, just keep going." Then coach Y when he says that I get annoyed and find it noisy and I don't want to do it, right there I just want to go, to say, "stop it, agg, don't say that, leave me alone," I don't know why it's that, yeah. (Laone).*

#### Teammates' influence:

*Mostly it is when I am watching someone, what they are doing. Say when I see X being fast in the bag I am like, "ah, I can punch more like X", but then when I try to do and I don't succeed I would be like, "ah, X is a guy, I am a girl, I can't" so there and there performance drops*

*Well, when we are in shadow boxing, when I do shadow boxing I am watching them, X, seeing him do better than what I am doing but then I tell myself that, "I can copy from him, I can do it", and I try to do what he is doing. (Botshelo)*

#### Opponents' influence:

*Those are the things that you think about when you go in. You look at them, at times you even just look at him, his physical appearance then you think, "hei, this guy may have power." When you look at him you see that he may have power so you know that defence, you have to make sure that all the time you have locked. If he is short, you think what, you start making a plan that, "I will keep him outside," if you see that he is taller than you it means, "I should really be closer to him," these things that you think before when looking at your opponent. (Masego).*

*When I am punching the bag that's when I get a real feel of the opponent. So when I punch the bag, the movements when I punch, that's when I feel like I am punching something, that is when I start visualising the opponent. The one thing that I am always thinking is to break him down, "break him down, accumulate more punches*

*on him, just break him down bit by bit, break him down” it is always “break him down” because I am always thinking about breaking the opponent down. I always see him breaking down. (Sylvester).*

Bout progress influence:

*Normally when I am fighting a tough opponent, seeing that he is tough, feeling that he is going to win the bout, I don’t just give up, I push myself that, “even if he wins, let me give him the match.” That is, give him competition so that next time if we play against each other he comes knowing that it is not easy to take a fight from Botshelo.*

[Botshelo]

*Even though I feel beaten I would still fight and tell myself to at least finish the rounds. This is me learning and it doesn’t matter whether I get hit and then I lose focus and I get angry because I feel that the person am fighting is not fighting fairly or is using more power than I am and stuff like that so I still take that am learning and take it as a learning curve. (Thabiso)*

Competition environment influence:

*In competition yeah, it’s a bit tough because there are people cheering out there and you will be thinking about “what if I lose? What if I disappoint these people?” and you put pressure on yourself. (Bangu)*

*Yeah competition is different, I am one person who is shy in front of people so I can be tired before going in the ring. When I see people a lot of thoughts come to mind that, “what if this person knocks me?” or “what if I lose?” so I think most of the times this is what cost me fights when I go into the ring. (Carlson)*



## 8. What uses do Batswana boxers ascribe to their self-talk?

Participating athletes' self-talk accounts were also analysed with regards to their use as an overarching theme. In this context, *use* is an all-encompassing term representing either the purpose, reason, usefulness, value, and advantage (Oxford Living Dictionary) of self-talk as per accounts of participating athletes. To some degree, this theme may seem to overlap with the self-talk function category reported under the self-talk content theme. However, this theme is distinct and is derived not only from reported self-talk cue words, phrases, and sentences but also from accounts where athletes explicitly stated what seemed to be the usefulness, purpose, and reason for using self-talk. The uses were also noted in the reasons participating boxers gave for believing their self-talk. It is worth emphasizing that the term *uses* is precisely used for this theme to highlight the thin line between whether participants' stated that self-talk uses have value and/or the reason. The present study did not probe or ascertain from the participants. The self-talk use theme was reported by almost all boxing participants. Analysis of self-talk use yielded four distinct categories: motivation, performance, control, and general. Table in Appendix F shows the four self-talk themes and the extent to which they are indicated.

**Motivational Uses of Self-Talk.** Participants' narratives reflected self-talk words, phrases, sentences, and stories relating to situations where they encouraged themselves to be in the mood for the activity, to persist when it was not easy or when they felt tired, and to give the activity more effort. Also, there were indications of self-talk geared towards enabling individuals to feel positive about their capability, the task, and the event at hand, and enabling the individual to feel prepared to carry out the task. Without implying superiority, motivation use was the most reported of the four self-talk uses. Advanced analyses of the

motivation use category generated four unique categories, which are: endurance, morale, assurance, and general. Morale category entailed self-talk with purpose, value, or helpfulness relating to mental readiness for the sporting activity and being positive about one's capability regarding the boxing task. Endurance uses relate to persistent effort in the face of difficulties, while assurance uses relate to affirming one's capability, and general uses theme communicates unspecified usefulness. Quotes below illustrate the morale, endurance, assurance, and general uses of self-talk from participants' retrospective reports:

Quotes illustrating the morale uses of self-talk:

*I believe them because it boost my morale, I go inside the ring believing very much that I can do it such that even performance ends up being very high. Also, I like to be positive at all times, it reduces stress. (Mokwena)*

*So you end up motivating yourself saying, "come on, come on!" and ultimately you get into training mode, everything falling in place. (Masego)*

Quotes illustrating endurance uses of self-talk:

*If you feel you are tired you tell yourself, "no I have to keep going, keep going, I am able to do this and that" and always keep on saying those things to yourself because they motivate you. (Aone)*

*...when I am tired I talk more, I would say, "I have been running every morning, I have been doing that circuit I behind X and then I am tired now? No, I can do much more," and then the moment I imagine my training, what I have been doing in training, then I just rise, I can feel that, "no you are not tired" that is, I can punch. (Bangu)*

Quotes illustrating assurance Uses of self-talk:

*Yes, most of the time I keep telling myself that, “never give up, never quit and with God everything is possible.” Even when in the box, I assure myself that with God everything is possible. (Malaki)*

*I usually assure myself that, “I have trained well, I have great skill, I train in the biggest club, I can use tactics I know to overpower the opponent. I can do this,” that what I usually tell myself. (Changu)*

Quotes illustrating general uses of self-talk:

*I think it would affect my training if I just train without telling myself anything...they work for me, they work for me. (Botshelo)*

**Performance Uses of Self-Talk.** Participants' self-talk reports reflect the value and/or purpose of self-talk towards executing their boxing tasks. Self-talk accounts that indicated value/purpose toward task execution were further categorised into two distinct categories, namely, tactic and technique sub-subcategories. Participants' reports reflected strategizing on how to approach bouts given an opponent's characteristics (e.g., weight and stance), how the opponent played (e.g., very mobile opponent and straight puncher), or the individual's level of tiredness (e.g., during a bout and training). Besides self-talk indicating planning, participating boxers also indicated the benefits of and/or reasons for self-talk towards skill learning, correcting, and improving their skills.

Quotes depicting tactical uses of self-talk:

*I like to look at the weight to say, “this guy weighs this much I weigh this much, we are equal.” Like last tournament I had trained, I was fit, but when we got there the guy weighed 74kg I weighed 71kg so I thought, “when he is weighing 74 kg and I weigh 71kg it means he is a bit heavier and if he is heavier it means he has more*

*power,” definitely it was like that. I looked at that and said, “I am lighter than him, and I have trained, so it is defense,” so I count on defense because he has power if he catches me, that’s it! (Masego)*

*It is usually to see what my opponent is doing and tell myself that my opponent is punching a certain group of punches and then I will counter... I will say, “now he is punching 1-2, he is punching jab and right so I should respond by slip and right...” (Noel)*

Quotes depicting technical uses of self-talk:

*So every time I am in there you need to correct yourself each and every second to tell my mind, “this is the punch that I am supposed to use, go southpaw...” They help me in improving my boxing skills. (Aone)*

*Proper technique, throw everything correctly, proper cross, rotate it well... (Sylvester)*

**Control Uses.** Participants shared the value and/or reasons for self-talk in relation to managing or regulating their focus, attention, and emotions during task execution.

Accordingly then, control uses were grouped into two sub-subthemes, attention and emotion control themes. The following quotes demonstrate reported concentration and emotion control uses of participants’ self-talk, respectively:

Quotes demonstrating attention control use:

*It is easier to focus, the moment you go into the ring and say, “I am here for myself, I am here to have fun, I am here to box”, then everything becomes, that is, it becomes automatic. You see things flowing, you punching, having speed, having power, as if you are dancing in the ring, just losing yourself in the ring at that moment. (Bangu)*

*I observed that there is a difference when I use them [self-talk], I tend to be more focused and have higher work ethic. (Larona)*

Quotes illustrating emotions control use:

*I sometimes regulate myself, I tell myself 'regulate your breathing, your breathing will help you through it all' that's what I tell myself. That's what I do and it actually works. (Thabiso)*

*...Also, I like to be positive at all times, it reduces stress. (Mokwena)*

**General Uses.** Amidst the rich self-talk stories shared by participants, some of the expressed value or purpose of self-talk was not specific but just a general indication of self-talk as depicted in the quotes below:

*I think it would affect my training if I just train without telling myself anything...they work for me, they work for me. (Botshelo)*

*Most of them are helpful because the moment you forget that "Bangu, I can do this", that is, being blank, having nothing that you are telling yourself you go out there, and then you go for training, and then after training you feel that, "ah, exactly what was I doing?" Just because you didn't have that motivation, you didn't tell yourself that "I want to do this" and that "I can do it". (Bangu)*

#### 4.4 Discussion

Generally, the current study aimed to investigate Batswana boxers' self-talk use in boxing settings. Five objectives guided the study aim. Firstly, the study sought to establish Batswana boxers' self-talk use, awareness, and beliefs. Secondly, the study endeavoured to

establish settings in which Batswana boxers use self-talk. Thirdly, the study sought to investigate Batswana boxers' self-talk content across boxing settings. Moreover, the present study endeavoured to explore ways in which Batswana boxing athletes use self-talk. In addition, the study aspired to identify factors that influence Batswana boxers' self-talk use. Finally, the study sought to determine the functions that Batswana boxing athletes assign to their self-talk.

The study found that participating boxers Batswana boxers use self-talk, believe the self-talk they use, and that some participants were unaware of their self-talk use until the study interviews. Motivation, technique, tactic, concentration, and emotion-control benefits were reasons cited in the boxers' self-talk beliefs. Since until now, self-talk use research has not targeted boxers and Batswana, besides adding to prevailing reports of athletes' self-talk (e.g., Hardy et al., 2001; Hatzigeorgiadis et al., 2011), the study suggest that populations other than WEIRD populations use self-talk in sporting activities. Further, the study is possibly the first to report direct results, which supports propositions that self-talk use can be intuitive or reasoned (e.g., Latinjak et al., 2019; Van Raalte et al., 2016). This knowledge is necessary ahead of the envisioned intervention because assuming that awareness leads to intentional and/or consistent self-talk use and vice versa, athletes' mastery of the self-talk strategy and/or therefore willingness to embrace the strategy differs. The finding suggests therefore, the likely importance of having some knowledge of athletes' self-talk use history when planning interventions.

Moreover, the present study found that participating Batswana boxers use self-talk in specific training (warm-up, shadow boxing, punching bag, sparring, and general training) and competition (bout) contexts. Without implying that incidence equates to importance, findings further revealed elevated self-talk use in bouts, punch bag, and shadow boxing contexts for

all boxers, than in other contexts (e.g., sparring and warm up). Differences in frequency of reported self-talk use may be indicative of reported unawareness of using self-talk and reflective of recall bias limitations. Still, the study supports documented research of athletes' self-talk use in training and competition (Cutton & Heaton, 2014; Hardy et al., 2001; Samson et al., 2017). The study adds the boxing context to sport contexts already documented such as taekwondo, basketball, darts, and swimming.

In addition, the current study found that Botswana boxers use different types of self-talk classified according to function (motivational and instructional) and valence (positive, negative, or neutral). Precisely, the boxers' reported self-talk content portrayed encouragement and targeted techniques and tactics (functions), and held tones that were either encouraging, discouraging, or neutral. The boxers' use of motivational and instructional self-talk was more prevalent than valence self-talk types. In context, overall, boxers used instructional self-talk more than motivational self-talk, with elevated instructional self-talk use noted more in shadow boxing than in other settings. Use of motivational self-talk was however, equal in bouts, punch bags, and shadow boxing settings. Although valence self-talk types were reported less compared to self-talk functions, noteworthy is that positive self-talk was the more prevalent of self-talk valence. Motivational and positive self-talk were distinguished based on whether the self-talk was only of a constructive tone (positive self-talk) or whether the constructively toned self-talk encouraged effort, confidence, morale, or psyched one up as well (motivational self-talk). However, at a context level, the present study found rather equal elevations of positive and negative self-talk during bouts, a prevalence like that of motivational self-talk in the same context (bout). Interestingly, the boxers used motivational, instructional, and positive self-talk equally during competition, suggesting that participating boxers alternate motivational, instructional, and positive self-talk during competition. Establishing whether the finding hints

to individual differences or competition circumstances is beyond the scope of the current study, suggesting avenues for future exploration.

Ascertaining the importance ascribed to any type of self-talk and the context is beyond the scope of the present study. The study however, provides a picture of self-talk used by participating boxers and distinct settings in which they use the self-talk. The information is considered useful ahead of the anticipated tailored skill-targeted self-talk intervention. Current findings echo reports in existing self-talk research and frameworks (e.g., Abdoli et al., 2018; Hardy et al., 2001; Hardy et al., 2009; Van Raalte et al., 2016), that athletes use self-talk that is described as motivational and instructional, and self-talk that is distinct in valence. Current findings do not provide cause and effect, but suggest that participating boxers use self-talk during boxing activities.

The present study further found indications of personal and situational influences on the boxers' self-talk use. Specific personal factors the boxers hinted to were the influence of emotions, belief in self-talk, and fitness, with emotions influences cited more than the other factors. Tiredness was reported more than other emotions (e.g., anger, laziness, moodiness, fearfulness, and nervousness). Reasons stated for self-talk belief (e.g., motivation, performance, emotion regulation, and focus control) suggested that use or non-use of a self-talk depend on belief about perceived value thereof. The identified situational factors, significant others (teammate and coaching behaviours) and competitions circumstances (bout progress, opponent characteristics, and competition settings), suggest that suggesting that a variety of external variables influence athletes' self-talk use. The aforesaid findings are in harmony with research pertaining to self-talk antecedents (e.g., Hardy et al., 2009; Van Raalte et al., 2016). In specific ways the findings support suggestions of a link between athletes' belief and their self-talk use (e.g., Theodorakis et al., 2000; Van Raalte et al., 1994)



and between coaching behaviours and athletes' self-talk (e.g., Zourbanos et al., 2006; 2007).

As well, early research suggested the association between opponents variables and the individual's self-talk (Hardy et al., 2009; Van Raalte et al., 2006).

In uncovering personal factors beyond those indicated in current self-talk frameworks, the study adds to current knowledge and informs future research. In landing support to already identified specific antecedents, the study strengthens proposition existing research already made, informing practice and future research. The influence of athletes' physical fitness and emotions on ensuing self-talk therefore, need to be incorporated in future self-talk research and conversations. Further, over and above using manipulation checks to verify self-talk use during interventions, inquiry into why agreed upon and/or alternative self-talk was used may provide improved insights into self-talk antecedents. Such insights may benefit practice, informing tailored skill-targeted self-talk interventions and general mental strategies.

Finally, the present study found that participating boxers' self-talk perceived that self-talk was useful for motivation, performance, control, and generally. Precisely, the study found that Batswana boxers associated their self-talk with benefits in such motivation elements as endurance, confidence, morale, assurance, and general motivation. Moreover, the boxers perceived self-talk to be useful in their tactics (e.g., work rate and planning), learning (e.g., correcting and remembering technique), and regulating concentration and emotions. Reports of emotions uses of self-talk are even more interesting given that the participants also reported high prevalence of emotions (personal antecedents), particularly emotions such as sadness, fearfulness, and tiredness. In this the study supports literature that have suggested specific motivational uses of self-talk (e.g., Hardy et al. 2001; Gammage et al., 2001) and showed evidence for motivation (e.g., de Matois et al., 2020); and instruction (e.g., Van

Raalte et al., 2018) benefits of self-talk. Research has reported evidence for the beneficial effects of instructional self-talk in improving attentional focus (e.g., Galanis et al., 2018; Zetou et al., 2014), concentration (Hatzigeorgiadis et al., 2007; Van Raalte et al., 2018) and control (e.g., Zourbanos et al., 2013). Also, studies have reported the beneficial use of motivational self-talk in enhancing effort and self-confidence (Zetou et al., 2014) and self-efficacy (Ay et al., 2013).

The current study findings are based on retrospective recall reports and therefore do not infer causation, necessitating a cautious interpretation of the results and suggestions. Still, the findings weigh in on existing discussions relating to self-talk functions, antecedents of self-talk, and benefits of self-talk use. The study provides a general picture of participating boxers' self-talk use in different boxing settings, their awareness of self-talk use, belief in self-talk, and a glimpse of the value, purpose, or meaning the boxers ascribe to their self-talk. In this, the study lays a necessary foundation for the anticipated think aloud and intervention studies employing the same boxers. Also, the value of the current study needs to be understood from the perspective of possible meaningfulness to the participants and the sport of boxing in Botswana. Given the close-knit boxing fraternity in Botswana and the small population of competitive boxers (approximately 100), the study may be useful, meaningful, and insightful to local boxers, boxing coaches, sport psychology practitioners, and other stakeholders. Accordingly, the value of the present study is by potential usefulness and provision of insights (Smith, 2018) on self-talk use among Botswana boxers rather than statistical representation. More so because that self-talk use has never been studied in the boxing context, and among Botswana.

Although the study's aim is achieved, methodology limitations related to retrospective recall being prone to recall bias or recall inaccuracies (Wisdom et al., 2012; Baskarada &

Koronios, 2017) are acknowledged. The ensuing study will thus address said limitation by investigating the same boxers' self-talk in real-time. Results of both studies will be useful in planning and implementing a tailored skill-targeted self-talk intervention for the boxers.

## **CHAPTER 5**

### **A study of Batswana Boxing Athletes' use of Self-Talk in Real Time**

#### **5.1 Introduction**

Following retrospective interviews, Chapter 4 reported the use of self-talk among participating Batswana boxing athletes. The athletes reported using self-talk in both training (e.g., shadow boxing, punch bag and sparring), and competition (pre and during bouts) settings. Participating boxers reported self-talk that reflected motivational (e.g., psyching oneself up) and instructional (e.g., telling oneself what technique to use) functions as well as self-talk that is constructive (positive), unconstructive (negative), and neutral in nature. Furthermore, chapter 4 found that participants' self-talk depicted characteristics categorised as 'person' and 'structure' themes. Specifically, the study reported that the person characteristic theme comprised first, second, and third person characterised self-talk, besides imperative and undetermined perspectives. The structure characteristic theme on the other hand entailed cue words, phrases, sentences, and question structure self-talk. Chapter 4 findings alongside other self-talk studies which utilised retrospective methods (e.g., Hardy et al., 2005; Latinjak et al., 2014; Miles & Neil, 2013) are limited by the likelihood of recall bias, yielding possible inaccuracy in reported information. There is therefore, the need to capture athletes' self-talk in real time to supplement self-report findings (e.g., chapter 4), adding to what is known about self-talk use in sport. This is formative by design in the thesis.

Self-talk studies have used methods such as observations (e.g., Van Raalte et al., 1994), case studies (e.g., Cutton & Hearon, 2014), open-ended questionnaires (e.g., Hardy et al., 2001; Van Raalte et al., 2015), interviews (e.g., Miles & Neils, 2013), surveys (e.g., Van Dyke et al., 2018) and intervention manipulation checks (e.g., Abdoli et al., 2018) to investigate athletes' self-talk use. However, prevailing research methods have shortcomings. For instance, observational studies enable analysis of self-talk that is audible but not

inaudible self-talk. Retrospective self-reports and questionnaires on the other hand have limitations pertaining to possible recall distortions (Dickens et al., 2018). For example, there is no way to verify that a boxer said, “jab to score” or something else, during task execution.

Efforts to capture inner experiences of athletes during sporting activity have used descriptive experience sampling (DES) (Dickens et al., 2018) and the think aloud (TA) (Whitehead et al., 2018; Whitehead et al., 2019; Whitehead et al., 2016; Whitehead and associates (2015) methods. These methods supposedly circumvent likely distortions labelled against retrospective self-reports (Dickens et al., 2018; Ericsson & Simon, 1993; Jasper et al., 2003). In the DES method, participants provide notes or ratings of their thoughts, mood, and aspects of the training or competition when prompted to do so, and during task execution. Subsequently participants are interviewed about noted experiences (Dickens et al., 2018; Stone et al., 1999). Nonetheless the probable impact of prompting athletes to write notes and pause play during training and/or competition raises questions about athletes’ natural flow of inner experiences during DES. The DES approach, therefore, cannot be feasible in boxing settings without hampering and/or influencing the natural occurrence of recorded thoughts.

Also, although the DES’ practicality in golf has been demonstrated (Dickens et al., 2018), it may not be as feasible in some sporting activities given the unique nature of such sports compared to golf. For instance, boxing is characterised by elevated levels of physical arousal during both training and competition. Also, boxing is a contact sport where protective gear such as gloves and mouth guard are used. Employing DES during boxing training and competition would therefore require giving athletes time to cool down (reduce heightened physical arousal) and/or remove protective gear to write or speak. When cooling down occurs during training or competition as opposed to at the end of the activities it is likely to tamper with performance thereafter and consequently related self-talk. On that basis, in boxing

settings the DES as an approach would need to be altered and tailored, reducing the fidelity thereof. Consequently, for purposes of the current study the DES was considered impractical.

The alternative approach to use to further explore Batswana boxers' self-talk use was the think aloud (TA) method. The TA approach entails respondents concurrently and continuously verbalising their inner thoughts aloud during task performance (Eccles & Aarsal, 2017; Ericsson & Simon, 1993; Jasper et al., 2003). The method encompasses three verbalisation levels. Level 1 verbalisation relates to effortlessly verbalising aloud one's inner thoughts. For example, a boxer saying, 'step in' or 'hook to turn' aloud. Level 2 verbalisation entails converting and vocalising internal representations that are in nonverbal codes. For instance, converting pain sensation, auditory stimuli, or visual stimuli. The individual only says aloud information that is in their focus. For instance, on hearing two loud taps on the table a boxer says, '10 seconds' communicating to themselves that there is 10 seconds left to the round. Level 3 verbalisation entails explaining one's thoughts, views, assumptions, or intentions (Ericsson & Simon, 1993). For example, a boxer explaining the verbalised phrase, '10 seconds'.

Following a review of studies, Ericsson and Simon (1993) found no proof that verbalisation at Levels 1 and 2 (concurrently verbalising thoughts) hampered task execution compared to when similar tasks are executed quietly. The finding was later echoed by a synthesis of studies (Fox et al., 2011), which found no evidence for alteration in thought sequence or accuracy performance when respondents concurrently verbalised thoughts (Levels 1 and 2) during performance without elaborating on the thinking process (Level 3).

The TA method has been used to investigate athletes' cognitive processes and decision making in numerous sports including cycling (e.g., Whitehead et al., 2019), Australian rules football (Elliot et al., 2020), golf (Aarsal et al., 2016; Whitehead et al., 2015),

baseball (McPherson & MacMahon, 2008), running (Samson et al., 2017), and cricket (McRobert et al., 2011). Further, the TA method has been used to capture athletes' thought processes during task execution in both non-competitive (e.g., Calmeiro and Tenenbaum, 2011; Samson et al., 2017) and competitive (Whitehead & Jackman, 2021; Whitehead et al., 2017; Whitehead et al., 2015) sport settings. Several points are noted from TA studies. Firstly, the studies demonstrate that athletes do use verbalisations during training and/or competition, in for example, long distance running, Australian Rules football, and cycling time trial. Secondly, the studies demonstrate the TA method's practicality in capturing athletes' real-time verbalisations during training and/or competition in for example precision (e.g., Calmeiro & Tenenbaum, 2011; Elliot et al., 2020), and endurance (e.g., Samson et al., 2017; Whitehead et al., 2018) tasks. Although many studies did not collect performance data to inform whether verbalisations were linked to performance parameters (e.g., Elliot et al., 2020; Whitehead et al., 2019; Whitehead & Jackman, 2021), some findings indicated that even at level 3 verbalisation (describing cognitive process) the TA does not hinder performance (Whitehead et al., 2015) or that the TA generally does not seem to alter performance (Fox, Ericsson & Best, 2011).

Whitehead and associates' (2015) study, which comprised two distinct but related studies is worth elaborating on because it reported comparisons made between the TA and interview findings. Study 1 explored differences in the amount of words produced by experienced and novice golfers during level 2 and 3 verbalisations. The study expected no performance differences between participants in level 2 verbalisation condition and those in the control condition. There was, however, expectation that experienced golfers in the level 3 verbalisation condition would be worse off than both the control and level 2 verbalisation conditions. Novice golfers in level 3 conditions were expected to perform better than both control and level 2 verbalisation conditions. Contrary to predictions, level 2 and 3

verbalisations did not significantly influence performance for both experienced and novice golfers. The findings thus suggest that the TA method does not hamper performance. The study also found that regardless of skill level, more data was generated at level 3 verbalisation than at level 2. To test the practicality of the TA method in collecting real-time cognitive processes compared to retrospective interviews Whitehead and colleagues (2015) followed up performance with retrospective interviews conducted at three different time intervals (10 minutes, 24 hours, and 48 hours) post-performance. It was expected that the more times passed the less congruent would the TA verbalisation and retrospective recall data be. Although data revealed congruency in data quantify, there were differences in types of information verbalised in real-time TA data compared to retrospective recall data, suggesting that thoughts golfers verbalised during the TA differed from what they reported in interviews. The incongruence between TA and retrospective recall data was low regardless of time interval post performance. The findings point to limitations of interview-based studies in shedding light on athletes' thought processes.

The present study draws from Whitehead and associates' (2015) findings to justify the need to follow up findings from chapter 4 and investigate participating boxers' real-time self-talk. Previously participating Batswana boxers took part in an interview study which investigated the boxers' use of self-talk in boxing settings (training and competition settings). Findings indicated that all participating boxers reportedly use self-talk, with most reporting being unaware of their self-talk use until interview questions were posed. Several themes relating to type of self-talk and characteristics of self-talk the boxers used were determined. The present study will thus conduct a follow up study using the TA method to capture athletes' level 1 and 2 verbalisations. Findings from the TA study will then be compared to the interview study findings to examine congruency or incongruence in identified self-talk use themes and prevalence.



Recently efforts to assess the association between self-reported and verbalised self-talk has been documented. Muynck and colleagues (2020) used a multi-method approach to investigate the relationship between competitive tennis players' self-reported and live-recorded self-talk. The study in which the players verbalised their thoughts during several tennis exercises found considerable correspondence between verbalised and self-reported measures, permitting the approximation of a latent factor demonstrating the use of multi-methods to assess self-talk. The study provided initial validation of the possible convergence between self-talk derived from athletes' recollection (retrospective reports) and in-action verbalisations (Muynck et al., 2020). Muynck and associates' (2020) study, lends support to Whitehead and colleagues' (2015) findings, which noted low incongruence between retrospective recall and TA data. The aforementioned studies are important in the self-talk research and make a case for the use of the TA as a follow up to chapter 4 study, particularly since the current study like the previous (chapter 4) is formative by design. The current findings will be used to tailor a skill targeted self-talk intervention for individual participating boxers.

The current study will record participants' self-talk during the shadow boxing and punch bag settings, in real-time. Although sparring and competition settings would be ideal to record self-talk in real-time, both are contact settings making the TA approach impractical. Shadow boxing and punch bag were therefore, considered practical and the safe contexts for the study. Shadow boxing and punch bag activities serve several purposes: a) refining punching and footwork skills, b) improving hand, eye, and foot coordination, c) developing and maintaining general fitness, and d) heightening strength and power. In addition, shadow boxing is beneficial to speed improvements (England Boxing Coaching Handbook, nd). Through shadow boxing and punch bag therefore, boxers practice skills, improve coordination, fitness, strength, and power needed during sparring and competition (bout)

performance. On that basis, the study considered shadow boxing and punch bag settings suited to identify self-talk, which participating boxers likely use even in contact scenarios.

The current study aimed to explore real-time self-talk use among Batswana boxers, during shadow boxing and punch bag settings. The study also endeavoured to explore self-talk use congruence between the boxers' real-time and retrospective reports data, during shadow boxing and punch bag settings. Findings will elicit the development of a tailored skill-targeted self-talk intervention for participating boxers. Three questions guided the study:

1. What self-talk do participating Batswana boxers use?
2. In what ways do participating Batswana boxing athletes use self-talk in real-time during shadow boxing and punch bag settings?
3. In what ways, if at all, are participating Batswana boxing athletes' real-time and interview self-talk similar and/or dissimilar?

## **5.2 Method**

### **5.2.1 Research design**

The current study utilised a realist approach. The approach stems from a view that a real world exists, a world that can be explored, understood, and expounded (Patton, 2015). From that standpoint, ideas, thoughts, explanations, and intentions are considered real, even if direct observation and description thereof is impossible (Maxwell, 2012). Further, the approach acknowledges that one incident may be interpreted differently by insiders because of differing perspectives. The various interpretations would be both meaningful and valuable to individual in context (Olsen, 2010). Having previously (chapter 4) reported participating boxers' retrospective self-talk, the present study chose a method that permitted the recording of the boxers' self-talk in real-time. The present approach (realist) gives participating

athletes' real-time self-talk centre stage. The recorded self-talk is considered to be their actual thoughts during specified boxing activities, at the time. The researcher's awareness of own limitations and influence is deemed essential for accurate reporting and interpretation of the athletes' recorded self-talk (Maxwell, 2012; Van, 2011). On that basis the position of the researcher in the current study is worth noting. The position of the researcher, (1) stems from curiosity regarding self-talk use during task execution in sport, (2) is driven by interest in exploring self-talk use among Batswana athletes in general, an interest heightened by previous provision of performance psychological support to said athletes, and (3) acknowledges and embraces culturally ascribed (fixed) aspects, which in this case include race, nationality, and, gender (Holmes, 2020).

To avoid the potential to under and/or over-report experiences or distort personal accounts (e.g., Stones et al., 1998; Brewer et al., 1991) the TA method was deemed the most suited approach for the present study. Participating boxers had previously taken part in a retrospective interviews study exploring the athletes' self-talk use. The TA method would allow for exploration of congruence between chapter 4 and current findings. The study captured level 1 and level 2 verbalisations without asking participants to describe or explain (level 3 verbalisation) their thought processes. Albeit, the TA approach has limitations, which include the potential for incomplete verbalisations (Wilson, 1994), verbalisations being enhanced by descriptions and explanations outside of participants' actual experienced thoughts at the time (Eccles, 2012), and possible unfavourable impact on task performance (Ericsson & Simon, 1993; Klatzky, 1984). The likely influence of elevated self-consciousness resulting from wearing the recording device or the presence of the researcher in the room cannot be denied. There is a chance however, that the extent of rapport built during the preceding interview study (chapter 4) and self-talk use awareness enhanced during the same may reduce chances of self-talk consciousness. Besides, comparison of the interview and

current study findings may help establish the likely influence of self-consciousness during real-time recordings.

The absence of documented self-talk research utilising boxing athletes necessitated the engagement of experts in the field of boxing. The experts would provide clarity and explain boxing language that is commonly used. Considering the lack of self-talk research conducted in the African, and specifically Botswana context, it was paramount that experts engaged be familiar with regional if not local boxing context. Consequently, to heighten social validation the current study purposefully engaged internationally accredited local boxing coaches with local and international coaching experience. The boxing experts had themselves played the sport at the highest amateur level (Commonwealth and Olympics Games) before their coaching careers. The study intentionally engaged expert coaches from the same cultural background as the participants, some of whom having coached the boxers at some point. That said, the study also included a coach from a different country who had expertise and experience level (coaching and boxing) similar to the local coaches. This would help reduce bias during discussions of participants' self-talk. In assembling local and regional boxing experts the study hoped to heighten accurate interpretation of the data and thereby findings that reflect boxers' thoughts and possibly, intentions.

### **5.2.2 *Participants***

Of the 17 boxing athletes who took part in the preceding interview study, 12 consented to participate in the current study: nine males and three females. To ensure anonymity, weight categories are indicated as a range rather than stating specific categories represented. Participants' competition level experience included inter-club, national, regional, and continental championships. To heighten anonymity, details pertaining to the number of participants per competition level are excluded. Participation reduction from 17 to 12 was due to work and/or academic demands resulting in schedule challenges and/or boxing training

cessation, as indicated in Figure 2. Table 9 below depicts other important demographic information.

**Table 10**

*Summary of Demographic Information*

<b>Demographic Variables</b>	<b>Lowest</b>	<b>Highest</b>	<b>Mean</b>	<b>Standard Deviation</b>
Weight (kg)	48	69	56.67	5.88
Boxing Experience (years)	1.6	9	4.24	1.98
Competition Experience (years)	.10	7.5	3.23	2.00
Age	18	26	22.02	2.16
Duration with club/coach (years)	.10	7	2.63	2.21

### 5.2.3 *Measures*

**Recording Devices.** The recording equipment comprised a Kam KWM1900 HS - UHF Wireless Headset Microphone System and a Zoom H5 Handy Recorder. Participants wore the headset microphone over the head supported by the ears. The headset mouthpiece stood at an angle, which allowed the capturing of participants' verbalisations without obstructing normal training.

**Technical Advisory Team (TAT).** Prior to the current study, I assembled a team of team of experienced International Boxing Association (AIBA) Star 3 coaches to offer technical expertise. Two of these coaches assisted in clarifying ambiguous self-talk cues words or phrases. Both coaches have competed at the Commonwealth and Olympics Games during their time, and have elite boxing coaching experience, which includes coaching athletes in World Championships, and the Commonwealth and Olympics Games. One of the coaches has a bachelor's and a master's degree in boxing coaching.

### 5.2.4 *Procedure*

**Gaining Entry and Recruitment.** Botswana's Ministry of Youth, Sport & Culture granted permission to conduct the study following the University of Botswana (UB) Research Ethics Office's recommendation. A purposive sampling method was utilised in that this group of participants was targeted because they: a) were boxers, b) had taken part in the preceding interview study, and c) reported self-talk use. Having read the information sheet (Appendix Q) participants formally consented to take part in the current study when they gave consent for the interview study (Appendix Q). Additionally, following a verbal explanation of the current study purpose, procedures, and participants' rights, participating boxers gave further verbal consent.

**Rapport Building.** Before I introduced the TA recording devices to the coaches and participating boxers, I attended boxing training sessions daily for two weeks to reinforce rapport built during the interview study (chapter 4). In addition, attending training was intended to enhance participants' familiarity with my presence during training and reduce chances of athletes' self-consciousness during the TA recordings.

**TA Practice Recordings.** Twelve TA practice recordings were scheduled and conducted (M = 3 minutes) during individual athletes' shadow boxing component of training. Each boxer practiced verbalising their self-talk aloud into an attached headset microphone for a complete shadow boxing round (three minutes) with options to have further practice if needed or preferred. During practice recordings, where necessary (e.g., if participant is observed to not be thinking aloud) the researcher prompted individual participants to think aloud. The purpose of practice recordings was to achieve several goals. Firstly, to establish a comfortable headset position for each participant and familiarity with using the device, minimising interference with training routines during actual recordings. Secondly, to ensure that athletes understood the instructions and were familiar with the study requirements, which would minimise prompting and interference with participants' natural thought processes flow. Thirdly, since the TA exercise would take place during normal training and in the presence of coaches, conducting practice sessions during normal training would hopefully normalise coaches' presence during recording. Finally, the TA practice recording would present an opportunity to invite coaches' feedback on the clarity of instructions given athletes and the practicality of the TA in specified training segments.

**TA Actual Recordings.** I involved the coaches in scheduling the TA exercise since recordings would take place during the shadow boxing and punch bag components of their normal, afternoon training time. The TA exercise was thus conducted during normal shadow boxing and punch bag components of daily training. The coaches accommodated the study

and made boxers shadow boxing and punch bag line-up flexible to ensure that the recordings took place as scheduled. At the most, I scheduled and recorded two participants in both the shadow boxing and punch bag per training session. The wireless device could record from several metres away, which allowed me to remain at a reasonable distance from participants during the recordings. Positioning oneself at a distance from athletes minimizes chances of interfering with participants natural thought flow (e.g., being a thought trigger) and normal training for both participating and non-participating. I simultaneously observed and listened to recordings on the recording device using a headset away from the training floor. Observing and listening to ongoing recordings allowed for detection of audibility, consideration of the practicality of the exercise, and informed decision making should there be reason to discard any recording(s) (e.g., activity disruption when prompted to think aloud). Such disruptions would be deemed to potentially interfere with natural thoughts flow during task execution, invalidating captured verbalisations.

Thirteen rounds of shadow boxing and 12 rounds of punch bag lasting three minutes each were recorded. One participant was only available for shadow boxing recording hence there were less punch bag recordings compared to shadow boxing recordings. Inaudible recordings were discarded, and participants were given the opportunity to repeat the process depending on their availability. One participant's shadow boxing and punch bag recordings were discarded and due to scheduling challenges, the process could not be repeated. Instructions given to participants are indicated in the appendix. TA instructions (Appendix R) were repeated after an athlete had worn the device, and prior to the start of shadow boxing or punch bag activities. Athletes did not receive any language related instruction. Participants said their thoughts in English with minimal Tswana language used.

**Participants' Anonymity.** I took several measures to heighten anonymity. Firstly, I used masculine and unisex pseudonyms to protect the three female participants. Secondly,



given the small number sample and therefore smaller sample per weight category, boxing experience, competition experience, and age, these are reported as a range to ensure anonymity. Moreover, age range is not specified for males and females because there were only female participants.

### **5.2.5 Data Analysis**

Three bilingual (Tswana and English) research assistants transcribed the TA recordings verbatim. During the transcription process the research assistants translated any Tswana words into English. I then concurrently listened to recordings and read the transcripts to verify the transcription and translation accuracy. Appendix G provides a sample of captured self-talk. Similar to chapter 4 (Table 6), a thematic analysis approach (Clarke & Braun, 2013, p. 121). The six phases are detailed in the preceding study (Chapter 4). It is noteworthy that some themes were predetermined based on the interview study. Moreover, the review and defining of themes phases were enlightened by existing self-talk literature (e.g., Hardy et al., 2009; Hatzigeorgiadis et al., 2011; Van Raalte et al., 2016).

**Engaging Boxing Experts.** I engaged the two coaches (TAT) to help me gain a better understanding of recorded cue words, phrases, and sentences. In addition, the TAT was involved to facilitate categorisation of transcribed self-talk. I shared a list of instructional and motivational cue words and phrases, with the TAT via a WhatsApp group created for the study purpose. The lists comprised self-talk cues that possibly overlapped between categories or sub-categories. I indicated to the coaches the instructional sub-categories (offense, defence, and tactic) and motivational sub-categories (effort, endurance, nerve, and morale) in which to classify the list of self-talk. The statement and question below preceded the lists posted in the TAT WhatsApp group:

The following is a list of some of the self-talk used by boxers and categories these self-talk may fit into. Under which category would you classify each of these self-talk cues and phrases?

The TAT classified self-talk cue words and phrases with explanations. The explanation included how some self-talk in the list (Appendix H) overlap between instructional and motivations (e.g., ‘10 seconds’), technical and tactical (e.g., ‘in and out’), offence and defence (e.g., ‘counter’), or between nerve and morale (e.g., ‘you are a beast’). The discussion afforded me the opportunity to interrogate explanations put forward, challenge my understanding of categories resulting in thoroughly considered classifications.

**Engaging Participants.** Participants were engaged to enhance my understanding of recorded motivational cue words and phrases, augmenting confidence in sub-categorisation of motivational self-talk. I sent a message comprising two questions and a list of motivational words and phrases (Appendix H) to each participant via WhatsApp. The list comprised motivational self-talk cue words and phrases shared with the TAT, however, the athletes’ list had no theme names indicated. I asked the athletes:

1. When a boxer says the following words or phrases during shadow boxing or punch bag what does a boxer mean?
2. What is a boxer trying to achieve?

Eight participants responded by either a message or voice note. I then used the responses to understand the self-talk cues and phrases’ similarities and differences and compared the athletes’ follow up responses to the consensus reached by the TAT forum. There was harmony in interpretations enabling me to finalise motivational self-talk sub-categories lists.

### **5.2.6 *Research Credibility***

To ensure credibility the current study considered eight criteria for excellent qualitative research (Tracy, 2010, p. 840) as demonstrated in Table presented in Appendix I.

## **5.3 Results**

Data comprised 14 941 characters, making up 3830 (100%) words. Shadow boxing data comprised 1839 (48.02%) words to 1991 (51.98%) punch bag words. The results are presented in alignment to the order of the two research questions: ways in which participants use self-talk in real-time, and ways in which participants' real-time and retrospective self-talk use is similar/dissimilar. Data was classified into two main categories relating to self-talk functions, self-talk characteristics, and ensuing sub-categories. Table 11 below presents identified real time self-talk themes and sub-themes, and descriptions thereof.

**Table 11***Themes and Sub-Themes Description*

Categories/sub-categories	Description
Self-talk function	Refers to the purpose of self-talk athletes use.
Motivational self-talk	Encompasses self-talk that is intended to make one ready, amplify effort, and to heighten confidence.
Instructional self-talk	Refers to self-talk that is meant to direct attention or ensure focus on the technique or strategy to use.
Self-talk characteristics	Relates to the way participants used self-talk and encompasses the structure and person of self-talk used.
Self-talk structure	Refers to the use of self-talk as either cue words, phrases, sentences, or questions.
Self-talk person	The use of self-talk phrased as either first person, second, person, third person or imperatives.

**1. What self-talk do participating Batswana boxing athletes use?**

Participating boxers recorded self-talk was categorised into two types of self-talk referred to as self-talk functions. Self-talk function relates to the purpose attached to athletes' self-talk. The athletes' self-talk function was classified into two categories, namely, instructional, and motivational self-talk. Examples of instructional and motivational self-talk used by the athletes include, 'swing your body' and 'now punish him', respectively. Table in

Appendix I shows the degree of instructional and motivational self-talk use in shadow boxing and punch bag settings. Further analysis of instructional self-talk category yielded three instructional sub-categories: technique (e.g., ‘combination’), tactic (e.g., ‘in-fight’), and kinaesthetic or body movement. Motivational self-talk category yielded seven sub-categories: effort (e.g., ‘work, work’), morale (e.g., ‘I can do it’), nerve (e.g., ‘you are a beast’), endurance (e.g., ‘you are not tired’), feedback (e.g., yeah, nice!), relaxation (e.g., ‘relax’), and alert (e.g., see the opponent’). Table in Appendix J depicts the extent of specified instructional and motivational sub-categories. Some self-talk cue words and phrases overlapped between sub-categories thus total units thereof exceeded main categories units total (Appendix J). For example, participating boxers and the technical advisory team considered the phrase and cue word ‘quick 1-2’ and ‘counter’ as both technique and tactic instructions, and the phrase ‘10 seconds’ as both morale and effort motivations.

Given the prevalence of technique sub-category in both shadow boxing and punch bag (Appendix K), further analysis thereof yielded two sub sub-categories: offence focused-self-talk (e.g., ‘hit target’ and ‘follow with a jab’) and defence focused self-talk (e.g., ‘guards’ and ‘catch the jab’). Some technique cue words and phrases overlapped between offence and defence sub sub-categories resulting in sub sub-categories units total exceeding the total of the main and the sub-category units total (Appendix K). For example, cue words ‘jab’ and ‘counter’ are categorised as both offence and defence technical instructions.

## **2. In what ways do participating Batswana boxing athletes use self-talk in real-time shadow boxing and punch bag settings?**

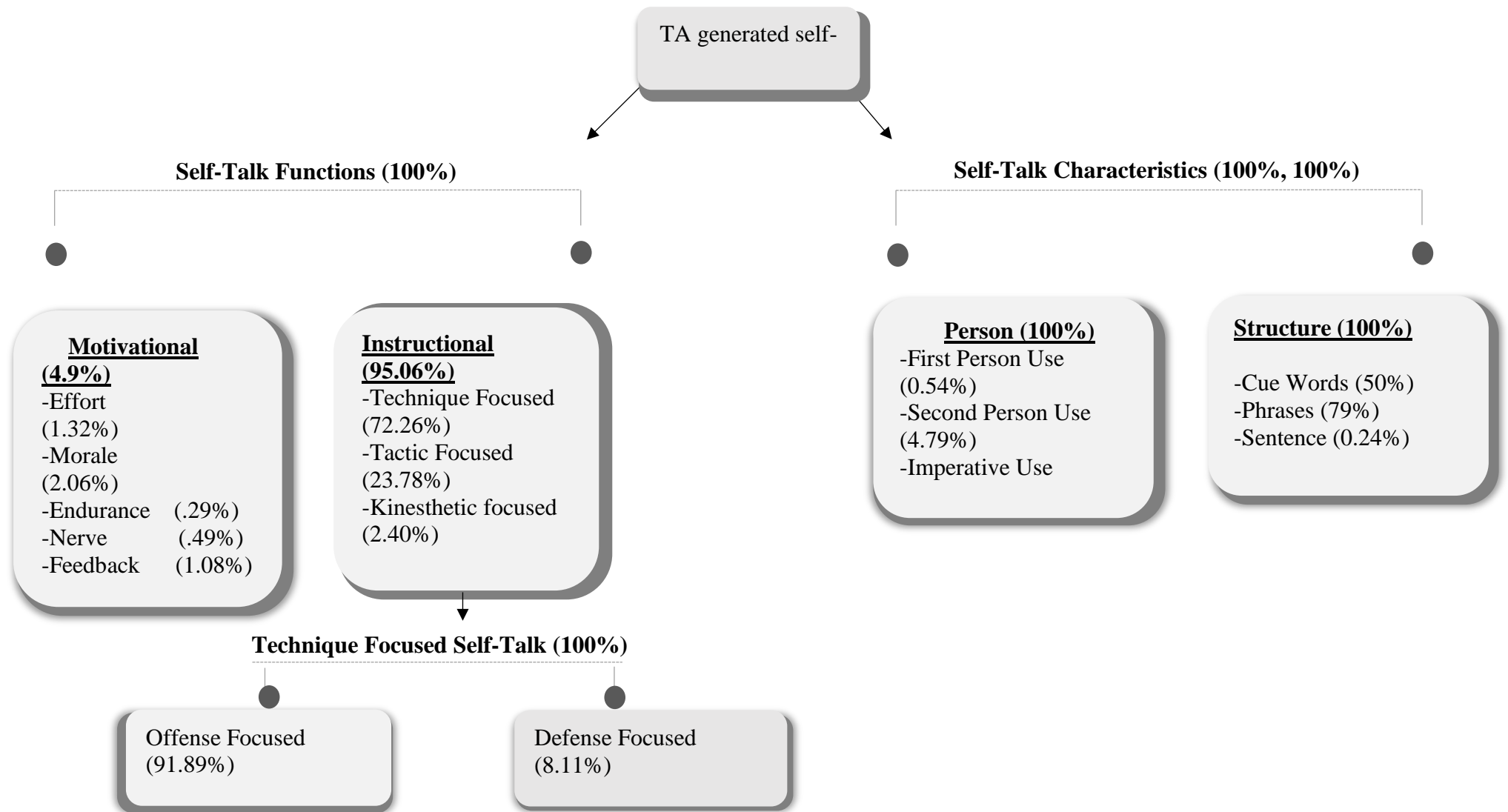
Self-talk characteristics represented the way participating boxers talked to themselves during shadow boxing and punch bag. Two self-talk characteristics sub-categories were derived, namely, structure and person characteristics. The self-talk structure category comprised three sub-categories: cue words (e.g., ‘jab’), phrases (e.g., ‘to the left’), and

sentences (e.g., ‘destroy this man, he is nothing’). The person characteristic category also consisted of three sub-categories: first person (e.g., ‘I can do this’, second person (e.g., ‘You are a beast’), and the imperative (e.g., ‘step in’). Table in Appendix L indicates the extent to which participating boxers used specified self-talk characteristics.

A summary of real time self-talk findings is shown in Figure 10 below

### **Figure 11**

*Summary of self-talk in real time finding*



**3. In what ways are participating Batswana boxing athletes' real-time and interview self-talk similar and/or dissimilar?**

Considering differences in the TA and interview approaches, comparison of participating boxers' shadow boxing and punch bag actual (TA) and retrospective (interview) self-talk focused on comparing similarity or dissimilarity between generated themes (type of self-talk and self-talk characteristics), sub-themes (e.g., function of the self-talk, person of the self-talk, and structure of the self-talk), and degree of self-talk use. Boxers' real-time and retrospective self-talk was similar and dissimilar in function and characteristics. In both real-time and retrospective data sets participating boxers' self-talk served motivational and instructional function. Moreover, in both methods the use of self-talk was similar in structure, data sets showed the use of cue words, phrases, and sentences. Another similarity related to the characteristics of self-talk used in real-time and interview, participating boxers phrased their self-talk in first and second person terms, and in the imperative.

Real-time and retrospective interview self-talk data sets were, however, dissimilar in that the latter reflected self-talk valence themes: positive (self-talk that has a constructive or helpful tone), negative (self-talk that sound unconstructive and/or signal adverse or undesirable emotions), and neutral (self-talk that is not necessarily helpful nor unhelpful in tone) self-talk (Van Raalte et al., 2016). Also, interview self-talk structure included self-talk expressed as questions. Table 5.8 (p. 38) exhibits real-time and retrospective interviews similarities and differences in type and characteristics of self-talk used. For purposes of appreciating the uniqueness of each method and hint to the likely complementary nature of the TA and interview approaches a comparison table illustrating prevalence of main themes in real-time and interviews is provided (Appendix M, N & O).



### 5.4 Discussion

The current study aimed to explore Batswana boxers' actual self-talk use during shadow boxing and punch bag settings following findings of retrospective interviews. The study findings would complement the preceding interview study and inform the formulation and implementation of a skill-targeted self-talk intervention for participating boxers. The study would also add to existing self-talk insights. Guided by three research questions the study endeavoured to (1) identify types of self-talk participating boxers' use in real time shadow boxing and punch settings, (2) establish ways in which Batswana boxers use self-talk during real world shadow boxing and punch bag, and (3) compare Batswana boxers' real time self-talk and retrospective self-talk findings in shadow boxing and punch bag settings.

Firstly, the study found that participating Batswana boxers do use self-talk during shadow boxing and punch bag settings, lending support to the preceding interview study, which reported that participating boxers use across training and competition settings, including shadow boxing and punch bag. Present findings echo documented studies which reported self-talk use during training in real-time (e.g., Calmeiro and Tenenbaum, 2011) and in retrospect (e.g., Hardy et al., 2001) and in laboratory and/or field experiments (de Matois et al., 2020; Hatzigeorgiadis et al., 2011; McCormick et al., 2018). Further, the findings concur with existing think aloud literature, which indicated actual self-talk use among athletes in different sport including golf (Whitehead et al., 2015), cycling time trial (Whitehead et al., 2017), and long distance running (Samson et al., 2017). The study therefore addresses recall bias issues associated with retrospective reports (Stones et al., 1998; Brewer et al., 1991), validating the preceding chapter findings. Moreover, the findings boost theories, which were founded on studies that did not demonstrate actual self-talk use (e.g., Hardy et al. 2009; Van Raalte et al., 2016), resulting in a rather cautious consideration of the models.

## SELF-TALK USE AMONG BATSWANA BOXERS

Noteworthy is that although the boxers' self-talk use was prevalent across settings, it was even more so in the punch bag setting, despite shadow boxing having more TA recordings (one more), suggesting that participating boxers use the strategy during the punch bag than the shadow boxing. Being aware of settings in which athletes use self-talk in training can be useful information for self-talk practice during interventions. Coaches and practitioners may know settings in which self-talk rehearsal may or may not benefit from prompting. Given that shadow boxing and punch bag activities are both useful for improving skills such as hand coordination, strength, power, and punch technique (England Boxing Coaching Handbook, n.d), recorded self-talk prevalence differences may be due to variances in the cognitive load between the two boxing activities.

Second, the study found that participating boxers' shadow boxing and punch bag self-talk classify into instructional and motivational self-talk. The boxers' instructional self-talk pertained to technique, tactic, and body movement, while their motivational self-talk related to effort, morale, nerve, endurance, positive feedback, relaxation, and being alert. Further, the findings support documented literature that described and categorised self-talk as serving instructional or motivational functions (e.g., Hardy et al., 2001; Hardy, 2006; Hatzigeorgiadis et al., 2011; Van Raalte et al., 2016). Moreover, experimental research has suggested the use of motivational and instructional self-talk in enhancing skills such as accuracy, speed, strength, and body movement (e.g., Hartzigeorgiadis et al., 2011; Tod et al., 2011; Tod et al., 2015), skills which shadow boxing and punch bag target (England Boxing Coaching Handbook, n.d). Also, the findings harmonise with the retrospective interviews study (chapter 4) and early research (e.g., Hardy et al., 2001) findings, which noted instructional (e.g., skill execution and tactical) and motivational (e.g., confidence, focus, relaxation, and effort) uses of self-talk. The findings are significant for the widely accepted definition of self-talk (Hardy,

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2006), which states that self-statements athletes use in sporting context serve at least the motivational or instructional functions.

Third, the study found differences in incidence of instructional and motivational self-talk. The use of self-talk pertaining to technique, tactic, and body movement exceeded that which pertained to motivation in both shadow boxing (98%: 2%) and punch bag (92.26%: 7.74%) settings (Table 5.4). Without implying attributed importance, the findings suggest that boxing athletes use self-talk more for instructional than motivational purposes, at least in said settings, hinting to untapped or underuse of self-talk among the boxers. This possibility is worth noting ahead of the anticipated tailored and skill-targeted self-talk interventions. Further exploration thereof found that the boxers used technical (e.g., ‘uppercut’ and ‘tight guards’) focused self-talk much more than tactical (e.g., ‘stay out’ and ‘stay out’), and body movement (e.g., ‘move your head’ and ‘rotate’) focused self-talk (72.26%, 23.78%, and 2.40%, respectively). The study further found that boxing participants’ technique instructions focused on two skill sets, offence (e.g., ‘keep jabbing’ and ‘lead with a two’) and defence (e.g., ‘guards up’ and ‘move away’), with offense-oriented self-talk the more predominant across settings.

If the actual self-talk represents skill execution, the finding may be indicative of participating boxers’ technique strengths and/or weaknesses. Although existing self-talk studies have highlighted instructional self-talk targeting technique, tactic, and body movement skills (e.g., Hardy et al., 2009; Hatzigeorgiadis et al., 2011; Van Raalte et al., 2016), exploration of, for instance, athletes’ self-talk specific to offence and defence components of technique skills is not documented. Perhaps such exploration is hindered by the limits of retrospective self-talk in providing a wealth of self-talk data that natural thought flow, which the TA can provide. Still, lack of further scrutiny to explore instructional self-talk in relation specific technique (e.g., offence skills) can limit self-talk use knowledge and

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comprehension. The present study findings suggests that instructional self-talk, at least as used by the boxers, is more specific to type of skill (offence and defense) than general skill, necessitating further research on the same.

Fourth, the study found that the boxers' self-talk took on two distinct characteristics, namely, structure and person. The boxers' self-talk was structured in the form of cue words, phrases, and sentences, with cues words and phrases equally were used (50% and 49.76%, respectively). The finding suggests that participating boxing athletes used self-talk that is concise and easy rather than detailed and complex, supporting self-talk structure used in experimental studies (e.g., Hardy et al., 2015; Hatzigeorgiadis et al., 2018). To my knowledge, no documented TA study has examined the *structure* of athletes' self-talk, limiting comparison to existing findings. The finding however, harmonise and validates early retrospective research findings (e.g., Hardy et al., 2001; Gammage et al., 2001), which indicated that athletes and exercisers used similar self-talk structures. The findings reflect the perspective of early private speech research (Goudena, 1992), which noted that private speech tends to be brief (e.g., 'in fight' instead of 'stay very close to the opponent and punch') and abbreviated, illustrating the individual's familiarity with the inferred statement.

Moreover, shortened self-talk may demand less mental effort compared to sentences, and thus may be the easy choice during physical strain in training. Since the boxers' experience in boxing averaged two years, the use of brief private speech may be reflective of participants' familiarity with tasks undertaken and /or preference for using self-talk that demands less mental exertion. Van Raalte and colleagues' (2016) sport-specific model of self-talk depicts System 2 (logical system) as prone to straining when overexerted, diminishing capacity thereof (Kahneman, 2003; Schmeichel & Baumeister, 2010). The use of shortened self-talk may help minimise depletion of System 2, sustaining proactive self-talk and minimising reactive self-talk (System 1 self-talk). Besides, shortened self-talk is easier to

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rehearse and can easily become automatic, preserving System 2 capacity, which can aid performance (Van Raalte et al. (2016). Nonetheless, further research is needed to scrutinise whether self-talk structure reflects athletes' preferences, and the relevance of self-talk structure in existing theories.

Besides using self-talk in structured form, the boxers self-talk was phrased in first person, second person, and imperative terms (e.g., 'I will drive him to the ropes,' 'you need to work' and 'step forward,' respectively), with imperative phrased self-talk predominantly used (94.67%). Absence of real-time self-talk studies investigating ways in which athletes use self-talk deprives the current study of suited comparisons. Still, present findings reverberate Hardy and colleagues' (2001) study, which reported first and second person terms in athletes' self-talk. Although existing self-talk frameworks (e.g., Hardy et al., 2009; Van Raalte et al., 2016) acknowledge different types of self-talk (e.g., self-talk functions and valence), the models do not incorporate self-talk characteristics. Indeed, Van Raalte and associates' (2016) model notes the grammatical form of self-talk (e.g., Sena et al., 2010), the models does not discuss self-talk characteristics. As theory stands then, self-talk characteristics relating to both person (e.g., first person and imperatives) and structure (e.g., cue words and phrases) of self-talk are yet to be explored and/or theoretically explained.

Although mindful of methodological differences and therefore the limitations of comparing TA findings with retrospective interview findings, comparisons were made between the present study and retrospective interviews findings (Chapter 4) because the studies employed the same participants. The TA and interview findings harmonise in three keyways, the studies revealed: (1) that participating Batswana boxers use self-talk in shadow boxing and punch bag settings; (2) similarities in main themes generated (type of self-talk and self-talk characteristics) under the specified settings. Harmony between real-time and retrospective reports findings (use of self-talk and derived themes) strengthens early research

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which reported self-talk use among athletes, athletes' self-talk functions, and structural and person characteristics of self-talk (Hardy et al., 2001; Gammage et al, 2001). Comparison findings partially support Whitehead et al.'s (2015) findings which reported some similarity between TA and retrospective interviews first-order themes. The current study found no difference in TA and retrospective interviews first-order themes (type of self-talk and self-talk characteristics) but found some differences in second-order themes where retrospective interviews generated more themes (second-order) than TA recordings.

One of the second-order theme differences related to the type of self-talk. Retrospective interview findings indicated self-talk valence type (positive, negative, and neutral self-talk) whereas TA findings only revealed self-talk functions - instructional and motivational self-talk (Appendix M). In addition, comparison findings noted differences within the person and structure characteristics second-order themes. Specifically, in terms of self-talk person interview findings included self-talk whose form was undetermined, and regarding self-talk structure interview findings comprised self-talk structured in question form. It is possible that the use of question structured self-talk in interviews suggests the reflective nature of interviews. Interview questions used in Chapter 4 invited reflection or recall of boxing activities to stimulate responses (Appendix Q). Although methodological differences between TA and interview approaches limits prevalence comparison, such comparison(s) is still noteworthy. Comparison may point to the possible complementary nature of TA and interview approaches in self-talk research and as self-talk needs assessment tools ahead of tailored interventions. The TA study recorded exceedingly more self-talk (2044 units) than the interview study (157 units), across the two settings. The stark difference in prevalence limited comparison at theme level, although it is worth noting that in both instances, imperatives were used more than first and second persons.

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Differences in self-talk prevalence between real-time and interview studies may be indicative of three possible explanations. First, recall inaccuracies and/or lack of self-talk use awareness may explain possible underreporting of self-talk use during interviews. Most participants (63.64%) in the present study had indicated (chapter 4) not being aware of their self-talk until participating in the interview study. Secondly, assuming the interview study enhanced participants' self-talk awareness, it is possible that enhanced awareness resulted in intentional and/or enhanced self-talk use ahead of and/or during real-time self-talk recordings. Lastly, real-time has the added advantage of thought flow (e.g., uninterrupted three minutes), yielding more self-talk use opportunity than may be recalled and reported during interviews or open-ended questionnaires. This is supported by Whitehead and colleagues' (2015) finding that TA data was richer compared to data from cued interviews, suggesting the superiority of real-time recorded self-talk over retrospective reports.

Comparison findings suggest the need to further investigate self-talk in real-time, without dismissing interview explorations because together the two approaches may augment understanding of athletes' self-talk use. The findings hint at the benefits of synchronised use of the TA and reflective practice echoed in a Whitehead and colleagues' (2016) study, which mainly used the TA method to provide reflection-in-action followed by retrospective recall to give reflection-on-action. The likelihood that retrospective recall (chapter 4) enhanced awareness of self-talk use and encouraged self-talk use among participating boxers suggest that using TA and reflective practice sequentially may benefit athletes' self-talk use and awareness thereof. Further, comparison findings from the present study suggest the supplementary role of using different methods sequentially, to gain in depth insight of the issue and participants under study. The use of different methods is common in psychology practice where for instance, in-depth intake interviews (e.g., Hughes & Byrne, 2009), diagnostic tools relevant to the a given psychology field (e.g., Diagnostic and Statistical

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Manual of Mental Disorders 5<sup>th</sup> edition, American Psychiatric Association, 2013), and observations (e.g., Epp et al., 2012)) are commonly used together to gain in-depth understanding of the individual's presenting problem(s) (e.g., Chafey, 2009). In sport, sequential use of TA and reflective practice has been documented in work with coaches (Whitehead et al., 2016). The study found improved awareness among the coaches, Self-talk interventions could utilise sequential method approaches to establish athletes' self-talk strengths and needs, guiding tailored interventions and possibly heightening effectiveness thereof. Research needs to include identifying skills needs assessment in the process to ascertain that tailored interventions are also skill targeted.

### ***5.4.1 Implications***

Current findings have implications pertaining to theory, method, practice, education, and subsequent research. First, existing self-talk frameworks do not incorporate the structure and person of self-talk in propositions made. Real-time and preceding interview findings indicate that participating athletes' self-talk has structural and person characteristics. Current findings, which echo early descriptive research and prevailing intervention studies make a case for consideration and incorporation of self-talk characteristics in future self-talk models or modification of existing frameworks. Second, present findings suggest the feasibility of the TA method in capturing athletes' self-talk during non-contact boxing settings, and providing rich data on the individuals' self-talk in action. Also, comparison of TA and interview findings suggest the potential for real-time recordings to validate retrospective self-reports, enhance understanding of athletes' self-talk use. Third, current findings suggest the potential use of TA as a self-talk and perhaps skills need assessment tool alongside the use of other methods of information gathering such as interviews and video analysis. By extension, the findings suggest the potential of the TA to complement other needs assessment tools to inform tailored skill-targeted interventions. Fourth, elevated use of technique focused self-



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talk during shadow boxing than punch bag setting suggests the need to educate athletes on the importance of rehearsing various techniques across settings. Also, the glaring difference in frequency between offence and defence focused self-talk suggests the need to educate athletes about the significance of rehearsing defence skills as much as they do offense techniques.

Lastly, aforesaid theory, method, practice, and education implications necessitate further research. More research is needed to enhance understanding of self-talk use and characteristics thereof. Moreover, further research is vital to scrutinise the practicality of the TA method in boxing non-contact settings, particularly in relation to whether using TA affects performance, and if so, in what way(s). Continued research can help explore ways in which the TA approach can benefit sports which like boxing, capturing self-talk in competitive settings is impractical. Also, there is need to explore the potential of TA as a self-talk and/or skill needs assessment tool, and/or a complimentary method to other methods including interviews. Moreover, it is necessary to investigate whether prevalence differences in the use of offense versus defence focused self-talk in punch bag and shadow boxing settings reflect skills deficiencies and consequently, opportunities for self-talk intervention. Finally, more research in boxing contexts is paramount to further understanding of self-talk use in the sport of boxing.

### **5.4.2 Limitations**

Although the current study method is novel in capturing actual self-talk of athletes in the sport of boxing and from a Botswana context the study has limitations. First, the study cannot establish whether and/or the extent to which actual self-talk athletes used in shadow boxing and punch bag is representative of real-time self-talk boxers use during contact settings (sparring and competition). The second limitation relates to the degree to which the TA captured self-talk is credible, whether the recorded self-talk occurred naturally. The study

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cannot ascertain whether participants' self-talk was not triggered by the fact that they were recorded and if so, the extent of such influence. Also, the study cannot establish the influence of situational factors (e.g., significant others and the researcher) during the recording and degree of such influences. Even so, the influence of variables such as significant other would not be deemed entirely a weakness of the study because existing literature has alluded to self-talk antecedents (e.g., preceding study; Hardy et al., 2009; Van Raalte et al., 2016). Third, although the TA method seems feasible in boxing non-contact settings, its feasibility in contact settings may never be established, therefore, we may never ascertain actual self-talk boxers use during contact settings. Consequently, there may never be an opportunity to investigate and compare actual self-talk during sparring and competition settings. Finally, the current study captured Level 1 verbalisations only, limiting comparison with existing think aloud literature, which captured Level 2 verbalisations as well (e.g., Whitehead et al., 2015).

In conclusion, the current study found that boxing athletes used self-talk during shadow boxing and punch bag. The study found that the boxers' self-talk served instructional and motivational functions, with participating boxers using instructional self-talk more than motivational self-talk, in both settings. At instructional self-talk sub-category level boxers utilised technique-focused self-talk more than they used tactical and body movement focused instructions. At technique sub-levels offence-focused self-talk was used more than defence-focused self-talk. In addition, Batswana boxers utilised self-talk structured in the form of cue words, phrases, and sentences, though phrases and cue words were used much more than sentences. Furthermore, participating boxers' self-talk was phrased in first person, second person, and imperative terms. Imperative phrased self-talk was employed far more than first person and second persons. Comparison of real-time and interview findings revealed similarities in self-talk use, self-talk functions, self-talk structure, and person, echoing existing literature findings. Nonetheless, there were differences observed between the current

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study and the preceding study relating to types of self-talk, self-talk characteristics, and self-talk prevalence. Further research is needed to explore actual self-talk use among boxing athletes, Botswana athletes, and athletes in general. Future research may shed light on differences in self-talk types, characteristics, and prevalence across settings, adding to existing theory, knowledge, and understanding of self-talk in sport. Moreover, future research is needed to explore the utility of the TA method as a supplemental diagnostic means towards identifying athletes' self-talk use, strengths, and needs ahead of tailored self-talk interventions. This will be depicted in a suggested model in the thesis synthesis.

## CHAPTER 6

### **Batswana Boxers' Perceptions of Coaching Instructions Influence on Their Self-Talk Use**

#### **6.1 Introduction**

The preceding interview study with Batswana boxers found that significant others are among the situational factors, which possibly influence boxers' self-talk use. The study found that teammates, coaching behaviour, and opponents' words and actions played a role in participating boxers' ensuing self-talk. Boxing athletes indicated that coaching instructions given during boxing activities (training and competition) played a role on their self-talk. Boxers reported self-talk content indicating the need to preserve energy in early rounds to avoid tiring easily and avoid negative reactions from coaches. Moreover, some boxers described being demotivated or motivated by different coaches despite similar coaching instructions, an interesting revelation which athletes could not explain. It is useful to point out that: (1) coaches differed in gender, (2) athletes who described being demotivated or motivated by coaches despite similar instructions were mainly females, and (3) motivation was gained from instruction given by coach of the same gender as the athlete. It seems that the coach's gender played a role in the coaching behaviour and self-talk relationship.

The interview study findings supported early research and current theory. The study harmonised with Hardy et al.'s (2009) framework, which proposed coaching behaviour, opponents, and teammates' influence on athletes' self-talk. Moreover, the study supported Van Raalte et al.'s (2016) model, which suggested that contextual factors, such as who is present, influenced athletes' self-talk. Earlier studies on the subject suggested coaching behaviour (e.g., feedback) influenced on athletes' sport experience, development, performance, and perceptions (Smith & Small, 2007). A few studies specifically investigated

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coaching behaviour's influence on athletes' self-talk (e.g., Zourbanos et al., 2006; 2007; 2010). Studies suggested a relationship between coaching behaviour and athletes' self-talk valence. For instance, Zourbanos et al. (2006) found coaching behaviour to be a predictor of athletes' positive self-talk.

Still, some research (e.g., Smoll & Smith, 1989) suggested that unsupportive coaching behaviour may have desirable impact on athletes' thoughts, especially in sports where negative coaching behaviour may be considered acceptable (e.g., aggressive sport). That is, when athletes consider negative coaching behaviours to be tolerable for their sport, such behaviours have no adverse effects on ensuing self-talk. The authors explained that, the impact of coaching behaviour depends on athletes' interpretation of such behaviour (Smoll & Smith, 1989; Zourbanos et al., 2010).

The aforementioned studies (e.g., Smith & Small, 2007; Zourbanos et al., 2006; 2007) suggested the role of coaching behaviour on athletes' self-talk. The studies did not determine cause and effect. A later study (Zourbanos et al. 2010) investigated the association between coaching behaviour and athletes' self-talk in the field, based on Hardy et al. (2009)'s framework, which suggests the role of coaching behaviour on athletes' self-talk. Generally, the study findings pointed to the importance of coaching behaviour role on athletes' self-talk and the need to further investigate this situational antecedent on athletes' self-talk. Zourbanos et al. (2010) went beyond correlation, the third study aimed to establish cause and effect between coaching behaviour and athletes' self-talk. The investigation found that coaching behaviour influences athletes' self-talk. Precisely, in the study, positive coaching behaviour reduced negative self-talk and negative coaching behaviour decreased positive self-talk. Even so, more research (correlational and experimental) investigating the influence of coaching behaviour on athletes' self-talk is needed. For example, we know little about ways in which coaching behaviours may influence athletes' self-talk.

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Current self-talk research (the preceding interview study included) and self-talk frameworks have not comprehensively expanded our understanding of the association between coaching behaviour and athletes' self-talk. For instance, we know little about how coaching behaviours in general, and how specific coaching behaviours, elicit positive or negative self-talk. We do not understand how or why athletes react differently (e.g., unpleasant and pleasant emotions; negative self-talk and motivational self-talk) to similar instructions when given by different coaches (e.g., the preceding interview study). Further research on the subject would add to what we know on the subject, and inform practice. Precisely, understanding how and why coaching variables affect athletes' self-talk in similar or unique ways will inform tailored self-talk interventions, and hopefully enhance the effectiveness thereof. Moreover, such understanding may underscore the importance of tailored self-talk interventions. Furthermore, findings have potential to strengthen current self-talk models (e.g., Sport-Specific Model and Framework for the Study of Self-Talk in Sport)'s proposition regarding coaching behaviour's influence on athletes' self-talk. Beyond self-talk intervention and research, in depth understanding of specifics of coaching behaviours' impact on athletes may be useful information towards team selection (athlete-coach pairing), augmenting performance.

The present study builds on the preceding interview study, which identified coaching behaviour as one of the self-talk situational antecedents. The study thus aimed to explore the role of coaching behaviour on Batswana boxers' self-talk. Firstly, the study sought to establish the influence of coaching behaviour on Batswana boxers' self-talk use. Secondly, the study endeavoured to identify specific coaching behaviour that seem to influence Batswana boxers' self-talk. Lastly, the study set out to investigate ways in which identified coaching behaviours possibly influence the boxers' self-talk. Three research questions guided the study:

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1. Do Batswana boxers perceive coaching behaviour to have influence on their self-talk?
2. What coaching behaviour(s) seems to have influence on their self-talk?
3. In what ways do identified coaching behaviour(s) seem to influence Batswana boxers' self-talk?

### 6.2 Method

#### 6.2.1 *Research design*

The current study employed a realist approach, athletes' reality of their interactions with coaches was explored, understood, and expounded (Patton, 2015). Directly observing and describing athletes' views, ideas, thoughts, explanations, and intentions was impossible, yet the validity thereof is considered and accepted (Maxwell, 2012). The realist approach gave athletes' voices centre stage (Van, 2011), and acknowledged that self-awareness of my limitations is necessary for accurate reporting of athletes' thoughts and interpretations thereof (Maxwell, 2012).

#### 6.2.2 *Participants*

Of the 17 boxing athletes who participated in the interview study, 11 took part in the current study: nine males and two females. To ensure anonymity, participants' weight divisions are reported as a range instead of specifying number of boxers per weight division. Participants' competition level experience included inter-club, national, regional, and continental championships. Details pertaining to the number of participants per competition level are excluded for anonymity reasons. Participation dropped from 17 (interview study) to 11 (current study) because of academic demands and injury, which resulted in participants missing training or ceasing boxing activities. Eight of the 11 participants completed the study with three not interviewed due to work schedule challenges. Table 12 depicts relevant demographic information for eight boxers. Besides athletes, five coaches consented and took

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part in the study. The coaches differed in terms of coaching experience and boxing level experience. Coaching experience ranged from 1 year to 13 years, and their boxing level experience ranged from local interclub to international (Worlds, Commonwealth, and Olympics) experience.

**Table 12**

*Participating Athletes Demographics Summary*

<b>Demographic Variables</b>	<b>Lowest</b>	<b>Highest</b>	<b>Mean</b>	<b>Standard Deviation</b>
Weight (kg)	48	69	57.63	8.19
Boxing Experience (years)	1.9	9	5.1	2.62
Competition Experience (years)	.10	8.5	3.96	2.71
Age	18	26	22.30	2.55
Duration with club/coach (years)	.1	7	3.33	2.85



### **6.2.3 *Video Assisted Interviews***

Miles and Neil (2013) considered video assisted interviewing a reasonably practical way to capture within performance responses post competition, with minimal recall inaccuracies. Their study used video footages of participating cricketers' batting innings (e.g., walking out to bat, facing first ball, and premeditating a bowler's delivery) to reduce chances of participants' poor recall during self-talk interviews about their batting innings. Video assisted interviews fell within 48 hours of recordings, lasting on average 25 minutes. This approach allowed athletes to reflect on self-talk they used during task execution, possibly enhancing participating cricketers' self-talk awareness and knowledge (Miles & Neils, 2013).

In sport activities where capturing athletes' inner experiences during task execution is difficult (e.g., boxing sparring and competition) video assisted interviewing can be an alternative, reducing memory bias. Video assisted interviews however, falls short in providing real-time experiences, and even with potential to curb poor recall, the method is still retrospective. Still, the present study deemed video assisted interviewing the best practical approach to employ in exploring athletes perceived coaching behaviour influence on their self-talk. This is in comparison to interviewing without video assistance. Video assistance can be useful in helping the individual relive the event and thus remember things better, it provides a vivid context for the athlete to speak in relation to.

### **6.2.4 *Measures***

**Recording Devices.** The recording equipment comprised a Kam KWM1900 HS - UHF Wireless Headset Microphone System and a Zoom H5 Handy Recorder for audio recordings. A Samsung Galaxy A5 tablet was used to concurrently video record athletes and coaches' interactions from the time the athlete entered the ring until they exited at the end of the bout.

### 6.2.5 *Procedure*

**Gaining Entry and Recruitment.** Botswana's Ministry of Youth, Sport & Culture granted permission to conduct the study. Participating athletes were targeted based on: a) participation in boxing, b) having taken part in preceding studies, c) reported using self-talk, and d) willingness to participate in the study. Coaches of participating athletes were informed of the present study during the interview study. The information sheet was shared with coaches and athletes (Appendix R), who afterwards signed the consented indicating willingness to participate in the study (Appendix R). On the day of recording (video and audio) a verbal explanation of the study purpose, procedures, and participants' rights to withdraw was given to athletes and coaches (individually), who then verbally consented to proceed with the study.

**Rapport Building.** Prior to the study I attended athletes training and interclub tournaments during which I recorded videos for individual athletes. Attending training and inter-club tournaments and recording the boxers' bouts enhanced rapport. In addition, video recordings prior to the present study recordings familiarised athletes with playing while being recorded.

**Video and Audio Recordings.** Coaches wore the Kam KWM1900 HS - UHF Wireless Headset Microphone System overhead with the mouthpiece at an angle allowing the capturing of coaching instructions and verbal interactions with athlete. Eleven video and audio recordings were captured during four different interclub tournaments. All video and audio recordings were visible and audible, and no recording was discarded.

**Video & Audio Assisted Interviews.** Interviews took place within 48 hours of recordings. Participants used Tswana and English languages interchangeably.

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***Interviewing.*** An interview guide was developed for the purpose of the study comprising six overarching questions and a possible follow up question under each main question (Appendix R). The interview guide was piloted to ensure clarity and suitability. The guide facilitated the interview and helped ensure coverage of the study objectives. The interviewing moments were cued by critical moments in the recorded bout at which point the video was paused and a conversation ensued. Critical moments included: moments before the start of a bout and/or round, the end of a round and/or bout, the athlete hinting that they wanted to talk about an occurrence during a round, a moment when the athlete turned their head to look at the coaches, moments when coaches shouted specific instructions repeatedly at a time, times during a round when the athlete had the upper hand or when the athlete was dominated, and when the referee paused play for technical reasons.

***Transcription & Translation.*** I am fluent in both Tswana and English languages and I transcribed all eight interviews verbatim, directly translating Tswana responses into English. I then concurrently listened to the recordings and read the transcripts twice to verify both the transcription and translation. A bilingual research assistant conducted a translation check on two transcripts randomly picked. The assistant concurrently read transcripts and listened to corresponding interview recordings. The assistant verified the translation accuracy.

***Participants Anonymity.*** I took several measures to heighten anonymity. Firstly, I gave participants pseudonyms (e.g., Laone, Lame, Botshelo, and Larona) excluding feminine names to protect the few female participants' identity. The small number of participants in the study meant that there were even fewer participants per weight category, boxing experience, competition experience, and age. The aforementioned demographics are therefore reported as a range and not specified for gender to ensure anonymity (see Table 12).

### **6.2.6 Data Analysis**

Data sets for eight participants who completed the study (recordings and the interview) was analysed. Like the preceding studies, the present study used a thematic analysis approach (Clarke & Braun, 2013, p. 121). The six phases are detailed in the preceding study (Table 6).

### **6.2.7 Research Credibility**

Generally, rigour in interviews can be affected by the interviewer's skills and rapport (Kidd & Parshall, 2000). I had worked with the study participants in two preceding studies. In addition, I had interacted with the boxers during training and competition for at least two months prior to the study, in addition to assisting the athletes for over a year prior to my departure to study abroad. There was a high level of rapport. The preceding interview study and 11 years of counselling psychology practice where interviewing skills are used daily, helped reduce the extent that interviewer skills became a credibility limitation. The current study considered eight criteria for excellent qualitative research (Tracy, 2010, p. 840) as demonstrated in Table 13 below.

**Table 13***Eight “Big-Tent” Criteria for Excellent Qualitative Research*

<b>Criteria for quality</b>	<b>Quality demonstration</b>
Worthy topic	The Topic: a) is relevant to current self-talk research, b) timely and important given the limited research exploring coaching behaviour influences, c) is interesting, presenting the opportunity to expand our knowledge and understanding of coaching instructions influence during competition, and d) encourages further research.
Rich rigor	The study: a) context and sample fit the study purpose, b) sufficient data collected in fitting context to answer research questions, and c) followed and documented appropriate video assisted interview approach, and the transcription and data analysis processes.
Sincerity	The study: a) research methods and challenges were openly discussed with the supervisory team.
Credibility	Findings link to preceding interview study findings and echo self-talk models' propositions.
Resonance	I hope the findings inspires practical and continued scholarly interest in interactions between athletes and coaches.
Significant contribution	The study has meaning and significance to a) self-talk frameworks, b) coaching behaviour influences research, c) methodology – the usefulness of video/audio assisted interviews conducted within days of recording., d) practical – encourages factoring in coaching instructions influences in self-talk interventions.
Ethical	The research process entailed: a) obtaining ethical clearance from relevant government authorities, formal permission from gatekeepers, and written and verbal consent from participants, b) emphasising participants' right to withdraw, and c) the use of pseudonyms to ensuring anonymity.

## SELF-TALK USE AMONG BATSWANA BOXERS

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Meaningful coherence	The study achieves stipulated goals and employed data collection and analysis methods and procedures fitting to the study goals.
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### 6.3 Results

The study results are presented according to the order of the study questions.

#### 1. Do Batswana boxers perceive coaching behaviour to have influence on their self-talk?

Participating athletes' responses indicated that coaching behaviour plays a role in their self-talk. Quotes below depict coaching behaviour influence on self-talk.

**Table 14**

*Sample*

What the coaches said	Resulting self-talk
<i>when I heard the coaches saying jab...</i>	<i>I was hesitant to follow their instructions because I was thinking, 'what if I jab and then I am not able to last long,'</i>
<i>The coaches were telling me that I should use two a lot, for me to use two and three because they said most of the times when I used them they landed</i>	<i>I told myself in my mind that, 'it means I should start using a combination that has three and two since they are the ones that are adding point for me.'</i>
<i>I wanted to hear how the coach would help, what he would say and he was saying, 'move from there'</i>	<i>but then it was difficult to move out and I thought, 'how can I move out?'</i>

*...when I heard the coaches saying jab I was hesitant to follow their instructions because I was thinking, 'what if I jab and then I am not able to last long, '' [Bangu]*

*The coaches were telling me that I should use two a lot, for me to use two and three because they said most of the times when I used them they landed, that is, when I used a two it scored but I wasn't using it and I told myself in my mind that, 'it means I should start using a combination that has three and two since they are the ones that are adding point for me.' [Malaki]*

*I could see that he had put me under pressure and I wanted to hear how the coach would help, what he would say and he was saying, 'move from there' but then it was difficult to move out and I thought, 'how can I move out?'. [Botshelo]*

## **2. What coaching behaviour(s) seem to influence Batswana boxers' self-talk?**

Having established that athletes perceived coaching behaviour to be influential during bouts, the analysis identified the specific influential coaching behaviour. In every response relating to coaching behaviour athletes used words that referred to speech and hearing. Athletes did not use words that referred to coaches' actions or non-verbal communication. One coaching behaviour was identified, verbal communication. Verbal communication incorporated phrases referencing to coaches' instructions and feedback. Coaching verbal communication influence was also reflected in accounts stating the impact of not hearing coaches during bouts. Table 15 below depicts evidence for the verbal communication behaviour.



**Table 15***Verbal Communication Theme Evidence*

<b>Theme</b>	<b>Evidence</b>
Verbal communication	<i>when you hear</i>
	<i>do what the coach says</i>
	<i>when I heard the coaches saying</i>
	<i>I would listen in the corner</i>
	<i>when they tell me</i>
	<i>the coach was talking</i>
	<i>listening to what the coach was saying</i>
	<i>every time when he said</i>
	<i>when the coach talks</i>
	<i>to hear what they are saying</i>

**3. In what ways does coaches' verbal communication seem to influence Batswana boxers' self-talk?**

Athletes' accounts indicated that coaches' verbal communication probably influences their self-talk through its influence on athletes' emotions and behaviour as well. Table 16 below shows sample quotes on the likely influence of coaches' verbal communication on athletes' emotions and behaviour.

**Table 16**

*Quotes Illustrating Possible Moderators of Verbal Communication Influence*

<b>Influence Moderators Theme</b>	<b>Evidence Quotes</b>
Influence on Behaviour	<p><i>...I remember the other fight..., there I could do what the coach was saying. He was saying, 'Bangu use that 2, it is effective,' you see, every time when he said 2 I used two and it landed...so it works when you can focus on what the coach is saying... [Bangu]</i></p> <p><i>I was not countering from a far, the coach was telling me to be medium distance so that whenever he made a movement, I would see him, and I did exactly what he told me. [Kagiso]</i></p> <p><i>For me to end up throwing that two I heard the coaching telling me to throw straight punches, 'long range, long range,' so I did that, I kept thinking, 'straight punches, straight punches.' [Botshelo]</i></p> <p><i>The coaches kept telling me, 'increase work rate' so I was trying to do what the coaches were saying outside because I could see that it benefitted me. [Malaki]</i></p>
Influence on Emotions	<p><i>...They [coaches] are very influential, they give you that strength, that energy, if they are very audible you can hear that they are with you in the fight. It sort of lifts you in the fight... I was fired up, it was now or never, it was time to win the bout and even the way the coach was talking, there was a lot of morale to tell the truth. [Lame]</i></p> <p><i>It's important [coaches' instructions] it's really good for your morale, you get motivated when you hear that positive feedback from the coach that you are on the right track, keep on going... [Larona]</i></p>

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*As the coach is talking outside...I feel that I have to do what he says if I don't do it I feel that maybe I might be disappointing him.... [Laone]*

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That said, athletes also revealed that coaches' verbal communication was not always influential, at times they disregarded coaches' instructions with reason. Three reasons athletes disregarded coaching instructions were identified: athletes' fitness, athlete's judgement, and bout circumstances. Table 17 below shows sample quotes reflecting the possibility that coaches verbal communication is not always influential.

**Table 17**

*Reasons Verbal Communication was Disregarded*

Themes	Evidence
Fitness	<p><i>Went in thinking that 'I am not fit, I haven't been training well' so even when I heard the coaches saying jab I was hesitant to follow their instructions because I was thinking, 'what if I jab and then I am not able to last long,' [Bangu]</i></p> <p><i>I was thinking, 'I am tired, so tired but ok, try and listen to what the coach is saying.' [Laone#]</i></p>
Athlete's Judgement	<p><i>...when the coach tells me to do something but I see that it will not work for me, I can make the coach think I am following the instruction, maybe do that once and then do what I deem would work for me... [Botshelo]</i></p> <p><i>...whenever I punched with a five I felt that it was missing because he stood far from me so...five was not working for me, but the coaches were saying, 'keep punching a five, that five is scoring, it is scorning.' While I felt that, 'eish, when I punched a five...combination with a five I usually feel that...I become exposed if I punch a hook first,' [Kagiso]</i></p>
Bout Circumstances	<p><i>...at times it is challenging to do exactly what they [coaches] want. Like there they wanted me ...to hit an uppercut and no longer use the left... (Sighs) it was a bit difficult [to do] because he hit with power and he punched behind the head and it was uncomfortable for me... [Mokwena]</i></p> <p><i>I could hear the coach saying, 'move out, move out'. This guy was disturbing me with punches, when someone disturbs me with many punches when I am supposed to move it becomes difficult...but I had heard the coach.' [Botshelo]</i></p>

## 6.4 Discussion

The present study built on the preceding interview study, which identified coaching behaviour as one of the self-talk situational antecedents. The current study thus aimed to explore the role of coaching behaviour on Batswana boxers' self-talk. Firstly, the study sought to establish the influence of coaching behaviour on Batswana boxers' self-talk use. Secondly, the study endeavoured to identify specific coaching behaviour that seem to influence Batswana boxers' self-talk. Lastly, the study set out investigate ways in which identified coaching behaviours possibly influence the boxers' self-talk. Findings indicated that coaching behaviour seems to influence the boxers' self-talk.

Participants' responses reflected self-talk use and content that seemed to be triggered by coaching behaviour and/or whose content reflected coaching behaviour. This supports the preceding study (chapter 4) which found that coaching behaviour reportedly influenced Batswana boxers' self-talk use. Moreover, the study echoes Hardy et al. (2009) self-talk framework model's proposition that coaching behaviour influences athletes' self-talk. Specifically, coaches' verbal communication was the specific coaching behaviour recurring in the boxers' responses and referenced where associated self-talk was used.

By identifying a specific influential coaching behaviour, the study adds to early research findings, which pointed to the influence of coaches' instructions (e.g., Zourbanos et al., 2010). It seemed that verbal communication not only influenced athletes' self-talk, but also influenced their behaviour and emotions. This suggests the likelihood that verbal communication influences athletes' self-talk directly and indirectly through its seeming influence on behaviour and emotions. The direct influence of coaches' verbal communication on thoughts is possible when viewed from a cognitive theory. The theory proposes that individuals' interpretation or perceptions of events (e.g., coaches' instructions) affects ensuing emotions and behaviour (Neisser, 1967). For instance, when coaching instruction is

deemed useful it is likely to be implemented, and when coaching instruction is considered helpful, positive emotions are likely to ensue. From that perspective, the study adds weight to findings that found a link between coaching instructions and self-talk valence (Zourbanos et al., 2006; 2007).

The likely indirect influence of coaches' instructions on athletes' self-talk can be understood from the cognitive behavioural model, depicting an interaction or interconnection between thoughts, emotions, and behaviour (Keagan & Holas, 2009). For instance, when athletes feel motivated by the instruction, they are likely to follow such instruction. When athletes can execute instructions their thoughts are likely to reflect the same. The cognitive behavioural model also helps explain the current finding that coaches' verbal communication did not always influence athletes' behaviour. For instance, when athletes deemed coaches' instructions to be impractical given bout circumstances or their fitness levels, athletes made a judgement to disregard instructions. The finding suggests that personal and situational factors possibly underpin coaching instructions influence on athletes' self-talk. Further, the study points to a possible interrelationship between personal factors (e.g., fitness, technical ability), situational factors (e.g., coaching behaviour, competition circumstances), and athletes' self-talk. This possibility supports Van Raalte et al.'s (2016) sport-specific model's proposed bidirectional relationships between self-talk and both personal and contextual factors.

Existing coaching behaviour influences studies (e.g., Zourbanos et al., 2006; 2007; 2010) and self-talk models (Hardy et al., 2009; Van Raalte et al., 2009) have not alluded to what athletes do with coaching instructions and ensuing emotions. Yet given the likely interaction between thoughts, emotions, and behaviour, paying attention to athletes' actions during bouts, and establishing emotions experienced at the time can enlighten us more on athletes' self-talk during competition. Moreover, given that coaching instructions are at times disregarded, and with reason, suggests ongoing decision-making during bouts. Although

decision making cannot be avoided during play, the expectation is that decision making be swift. Yet, in the preceding interview study boxers reported using sentences and questions, which may impact focus on skill execution, strategizing and problem-solving during bouts. Given that amateur boxing is characterised by high intensity three-minute rounds of offence and defence, decision making needs to be swift in comparison to such sport as golf and football. Deciding on whether or not to follow external instructions need be swift.

#### **6.4.1 Limitations**

Firstly, the study examined coaching behaviour influences during bouts, a setting where the degree to which boxers' can observe the coaches' non-verbal communication is limited compared hearing the verbal communication. Training settings such as during pad work or shadow boxing may therefore have provided a perspective beyond verbal communication influences. This is worth considering in future research. Secondly, from a statistical view point the sample size can be considered a limitation, limiting applicability of findings to other Batswana boxers and boxing athletes in general. That said, the study's aim was not to be statistically representative, rather, to add understanding of participants' self-talk use before planning a tailored skill-targeted intervention for the same boxers. From that perspective, the study representation is considered from a meaningfulness or relevance perspective. Thirdly, limitation relates to the method, the study is qualitative therefore the findings cannot make correlational and cause and effect claims. The study can only hint to the likely association between coaching instructions and athletes' self-talk, and likely bidirectional relationship between self-talk and both personal and situational factors. Finally, the study being retrospective in approach carries the likelihood of memory inaccuracies. To avoid inaccurate recollection, the study had minimal prompts related to self-talk and coaching behaviour aiming to instead allow athletes to share voluntarily. This possibly resulted in a less in-depth exploration of the subject.

#### **6.4.2 Implications**

The current study has implications for theory, practice, and future research. Regarding theoretical implications, findings suggest a likely bidirectional association between self-talk, personal factors, and situational factors. Current self-talk frameworks are limited in explaining ways in which coaching behaviour influence athletes' self-talk. Indeed, Van Raalte et al. (2016) model suggests bidirectional relationship between contextual factors and self-talk. However, similar to Hardy et al.'s (2009) framework, both are not extensive in suggesting explanations of how coaching behaviour, for instance, influences self-talk. The models and current studies are limited in explaining ways distinct coaching behaviours may influence athletes' self-talk. Limitations in current models to elaborate on how coaching behaviours influence athletes' self-talk indicates limitations in prevailing self-talk research.

The current study has practical implications. Given support for the role coaching instructions have on athletes' self-talk, behaviour and emotions, interventions aiming to enhance the effectiveness of coaching instructions are necessary. Such interventions may help lessen athletes' internal conflicts regarding whether to and when to adhere to instruction. Although the findings do not provide causation and effect indications, it sensitizes coaches and sport psychologists on factors to consider (e.g., athletes' judgement, self-efficacy, and technical ability) when planning and delivering self-talk interventions. Findings suggest the need to enhance athletes' decision-making abilities regarding coaches' instructions and thus lessening internal conflict regarding adhering or not adhering to instructions during bouts. Improving personal factors is ideal since it is within the athletes' control and improvements thereof can lessen negative influences of situational factors including coaching behaviour. Even more, improving personal factors is best given that athletes often change coaches, especially when selected into national teams.



Stated theoretical and practical implications necessitate furtherer research. Findings point to the need to investigate the likely interrelationship between personal antecedents, situational antecedents, and self-talk. Specifically, research investigating coaching behaviour influences during training environments would add more insights because in training (e.g., during pad work) there is more interaction (e.g., space, time, permissible), wide range of interaction (e.g., verbal and non-verbal communication), and occasion for boxers to both hear and observe coaches (e.g., feedback and technique demonstrations). Furthermore, future research can have repeated data collection points in both competition and training environments, allowing in-depth data collection. In depth data collection would yield opportunities to investigate types of verbal and non-verbal communication, types of self-talk variable and variances thereof across settings. Even more, research could use the think aloud method to capture athletes self-talk in training settings with the coach present and absent, and varying interactions when coach is present (e.g., with and without interaction, with and without verbal interactions). Additionally, further research needs to examine causation in the association between coaching behaviour and participants self-talk, including behaviour and emotions. Cause and effect studies may give added insights on how coaching instructions, for instance, affect self-talk.

### **6.4.3 Conclusion**

In conclusion, boxing athletes' self-reports suggest that coaching instructions play a role not only in their self-talk during bouts, but also in their emotions and behaviour. The influence of coaching instructions on athletes' self-talk seems to be direct and indirect. Indirect in that coaching instructions seem to also influence emotions and behaviour, suggesting interrelatedness between thoughts, emotions, and behaviour. The findings also suggest that both personal and situational factors influence athletes' adherence to coaching

instructions. Further research is needed to establish causation and to give insights on coaching behaviour influences outside competition.

## CHAPTER 7

### **Tailored Skill-Targeted Self-Talk Intervention: Botswana Boxers**

#### **7.1 Introduction**

Numerous studies have demonstrated that self-talk enhances sport performance (e.g., chapter 3; De Matos et al., 2020; DeWolfe et al., 2020; Hatzigeorgiadis et al., 2011; Javier et al., 2019) including systematic reviews (e.g., Tod et al., 2011) and a meta analytic review (Hatzigeorgiadis et al., 2011). Prevailing self-talk and sport performance research, however, has limitations. One limitation pertains to contexts utilised by the bulk of present studies. Many self-talk studies in sport have occurred in laboratory contexts (e.g., Abdoli et al., 2018; Hatzigeorgiadis et al., 2018). Laboratory settings are useful for controlling untargeted variables (McLeod, 2012). For example, bicycle heats carried out in laboratory settings do not entail opponents, audience, and importance of the event variables. Other studies employed training or field settings, (e.g., Galanis et al., 2018; Hardy et al., 2015; Zetou et al., 2014a). In many field settings, although intervention occurred in natural environments, targeted skill execution was isolated from normal training. In normal training conditions untargeted variables are not controlled. For instance, in normal volleyball practice there are teammates, coaching behaviour variables, and athletes do not practice the serving skill in isolation from other skills. Given that self-talk intervention research employing competition and actual training settings is wanting, our understanding of self-talk intervention effectiveness is limited.

The second issue is that studies have employed few highly skilled or competitive athletes (chapter 3, Hatzigeorgiadis et al., 2011; Tod et al., 2011) and studies which utilised highly skilled, experienced, competitive athletes used laboratory settings (e.g., Abdoli et al., 2019; Edwards et al., 2008; Hase et al., 2020) and field settings (e.g., Cooper et al., 2019;

Walter et al., 2019). Prevailing self-talk efficacy evidence is, therefore, generalizable to mainly students and novice athletes' sport performance than to skilled and competitive performers. The final issue pertains to self-talk intervention effectiveness. Evidence for self-talk intervention efficacy, the ability to enhance performance in randomised controlled trials, abounds. However, little is known to make us confident about self-talk intervention's effectiveness, the usefulness thereof in the real world. Moreover, self-talk intervention's ability to yield expected results when tailored to specific skills needs in the real world is limited. Competition and actual training contexts are not controlled. Skill execution in unregulated environments (actual training and competition) therefore requires athletes to not only focus their attention on task-relevant stimuli, but to also switch concentration between changes in task-pertinent stimuli and other factors (Hardy et al., 2009; Van Raalte et al., 2016). For instance, effective execution of skills necessary for overall performance (e.g., accurate punches, effective guards, and feinting) requires athletes to navigate various complex personal and situational variables (e.g., own fitness, opponent's style, and coaching instructions).

The need to investigate the usefulness of self-talk interventions on competitive sport performance, and “on performance features in sports where overall performance depends on multiple and complex factors, such as performance of the opponent” (Hatzigeorgiadis et al., 2014, p. 93) cannot be overemphasised. Sport such as boxing, where overall performance depends on various and multifaceted variables, demand self-talk interventions that target overall performance (technique and tactic). This is not to imply that interventions ought to target all technique and tactic skills, rather, that self-talk interventions need to be tailored to target skills necessary for heightened overall performance. Such an approach can reduce chances of athletes focusing on one skill (e.g., defence) over others (e.g., offense and tactic).

During competition, combat sport demands swift responses, elevated concentration, self-control, temperance, regularity, and determination (Pedro & Durbin, 2001). Further, during combat (training or competition) situations change in a blink of an eye, placing demands on the individual's emotions and mental skills. To defend and attack concurrently during bouts when tensions are high, and without giving away ones' intentions is strenuous. Moreover, making decisions under competition pressure, in the face of hostile opponents' is difficult, as is making tactical decisions without losing sight of goals (Ziv & Lidor, 2013). Thus besides, agility, power, muscular strength, and advanced speed, psychological attributes such as self-efficacy, motivation, and mental toughness are considered vital components for superior skill execution in combat sport (Blumenstein et al., 2005; Devonport, 2006; Slimani & Cheour, 2016). Though self-talk interventions carried out in combat sport are limited (e.g., Slimani & Cheour, 2016), combat sport practitioners (e.g., martial arts, kickboxing, and participating boxers) have reported the use of self-talk in their sporting activities (e.g., chapter 4 and 5; Devonport, 2006). Limited research on the effects of self-talk intervention in combat sport, competition, and actual training ought to provoke continued research on the subject. The current study thus focused on the combat sport of boxing, in the real world.

Boxing has been ranked as the most difficult of sports, the closest of combat sport, martial arts, ranking sixth (ESPN, 2010). The 60 sports were rated on 10 athleticism categories: endurance, strength, power, speed, agility, flexibility, hand-eye coordination, nerve, durability, and analytic aptitude. Total Sportek (2016) also ranked boxing the most difficult of 25 sports based on performance scores in athleticism categories. Given the difficulty of boxing (ESPN, 2010; Total Sportek, 2016), the strain of making technical and tactical decisions during heightened tension when facing an aggressive opponent, and the swift circumstance changes during combat (Ziv & Lidor, 2013), tailored skill targeted interventions may help augment boxers' performance. Establishing the effectiveness of self-

talk use among boxers can add to current comprehension of self-talk and sport performance. Investigating self-talk usefulness in boxing real training and competition settings has potential to inform practice and help heighten boxing athletes' holistic performance in competitive environments. Heightened performance following self-talk interventions may make it possible for aspiring boxers to qualify for and compete well at major games like the Commonwealth Games and the Olympic.

The primary aim of the study was to investigate the effectiveness of a tailored skill-targeted self-talk intervention among skilled and competitive Batswana boxing athletes in training and competition. The study had three objectives:

1. To examine the effectiveness of a tailored skill-targeted self-talk intervention on individual boxing athletes' straight, uppercut, and hook punches during sparring and competition.
2. To investigate the effectiveness of a tailored skill-targeted self-talk intervention on individual boxing athletes' guards use during sparring and competition.
3. To highlight perceived usefulness of a tailored skill-targeted self-talk intervention on individual athletes' holistic performance during competition.

## **7.2 Method**

### **7.2.1 *Experimental Design***

The study employed a single-subject multiple baseline approach to examine the effectiveness of a tailored, skill-targeted self-talk intervention on boxing athletes. The experimental contexts comprised training (sparring) and competition (bout). The experiment entailed assessing baseline performance, an intervention introduction session, an intervention

planning session, self-talk use during practice sessions, assessing post-intervention performance, and conducting manipulation checks.

### **7.2.2 Context**

**Boxing in Botswana.** The sport of boxing in Botswana comprises mainly young people from low socioeconomic status, many only having basic education. Young people who play boxing usually join the sport during their junior secondary school years. This is a time when most school age children in public schools are introduced to or have access to a variety of sports besides football, netball, and athletics. In Botswana, boxing clubs bear the financial responsibility of providing their athletes with transportation, accommodation, and meals, during tournaments. Many of the athletes also depend on their clubs to help them with public transport fares to attend training during the week. Boxing clubs, therefore, strive to reach podium finish during the National Championship, partly because the resulting monetary incentive helps them feed and transport their teams during tournaments. Individual boxers aim to win the National Championship, hoping to earn a place in the national team. The Nation and the Botswana Association have sent at least one boxer to the Olympics since 1996 except for Rio 2016, Brazil. Boxing is thus one of the few sports locally that have represented Botswana more times on the global stage. Failure to represent the country at the Rio Olympics challenged the Boxing fraternity to ensure that in the next Olympics there would be representation.

**Boxing Season.** The Botswana boxing season commences in early February of every year, ending nine months later. During the nine months boxers participate in fortnightly inter-club tournaments scheduled in venues across the country. The season culminates with a National Championship at the end the year, November/December. The Championship applicable to the current study lasted a total of five days, spread over two weekends. To qualify for the championship boxers needed to have played in at least 70% of local bouts.

Boxers could also make the 70% bouts percentage by including participation in regional, continental, and international competitions.

**Timing of the Study.** The study was conducted in the last three months of the season, allowing enough time (six tournaments) for competition baseline recordings during the fortnightly tournaments. When athletes could not participate in a tournament due to ill health, fitness challenges, work, or academic commitments, there were opportunities to record competition baseline in future tournaments. Post intervention competition tests targeted the national championship and Botswana Games.

**Training and Competition Settings.** Athletes trained in the club gyms for the first month of the study. I was then granted permission to use the Botswana Boxing Association (BoBA) gym for the duration of the study. The gym was more spacious and better equipped. The entire club (including non-participants) relocated to train at the BoBA premises for the remainder of the project duration. The spacious gym minimised interrupting or inconveniencing participants and non-participating teammates, particularly during sparring baseline and post-test recordings. Competition baseline recordings took place during four tournaments, in different venues. Most competition baselines were recorded in Gaborone City (study venue), and a few in Francistown, 500km from Gaborone.

### **7.2.3 *Participants –Demographics***

Nine boxing athletes participated in the sparring and competition baseline phase: seven males and two females. Seven participants commenced the intervention but only five completed the full intervention and testing regime. Participants' competition level experience included inter-club tournaments, national championships, regional, and continental championships. Participants thus comprised of semi-skilled and highly skilled competitive boxers (see Table 18 below). To ensure anonymity, weight categories are indicated as a range, and the numbers of participants per competition level are excluded. Injury and



work/academic demands led to a reduction in full participation from nine to six participants.

Table 18 below depicts other demographic information for the nine boxing athletes who commenced the study.

**Table 18**

*Summary of Demographic Information*

Demographic Variables	Lowest	Highest	Mean	Standard Deviation
Weight (kg)	51	69	57.33	
Boxing Experience (years)	1.6	9	4.33	
Competition Experience (years)	.10	7.5	3.16	
Age	18	26	22.31	
Duration with club/coach (years)	.1	7	2.71	

**7.2.4 Participants' Background**

**Participant 1.** Bangu is an amateur boxer with tertiary education and at least two years of boxing experience. The boxer's competition experience comprised inter-club, regional, and continental competitions. At the beginning of the intervention the athlete had

participated in 13 of the expected 16 bouts for the season. Bangu had been training in the same club and under the same coaching team since becoming a boxer.

**Participant 2.** Larona is an amateur boxer with tertiary education and over a year boxing experience at the time. The athlete's competition experience comprised inter-club and regional tournaments. At the beginning of the intervention the athlete had participated in 12 of the expected 16 bouts for the season. The national championship semi-final and final became Larona's 13<sup>th</sup> and 14<sup>th</sup> bouts of the year, respectively. The athlete had been training in the same club and under the same coaching team since becoming a boxer.

**Participant 3.** Kagiso is an amateur boxer with over seven years boxing experience. The athlete's competition experience comprised inter-club, regional, and continental participation. At the start of the intervention Kagiso had participated in 15 of the expected 17 bouts for the season, winning 11 of 17 bouts. The national championship semi-final and final became Kagiso's 16<sup>th</sup> and 17<sup>th</sup> bouts for the year, respectively. The athlete had been training in the same club and under the same coaching team since becoming a boxer.

**Participant 4.** Aone is an amateur boxer with tertiary education and at least 12 months experience in boxing. The boxer's competition experience comprised inter-club, regional, and continental competitions. At the beginning of the intervention the athlete had participated in nine of the expected 16 bouts for the season. Aone had been training in the same club and under the same coaching team since becoming a boxer.

**Participant 5.** Botshelo is an amateur boxer with tertiary education and over four years boxing experience. The athlete's competition experience comprised inter-club tournaments. When the intervention commenced Botshelo had participated in 12 of the expected 16 bouts for the season, winning most of the bouts (8). The athlete's participation in all four rounds of the championship (preliminary, quarterfinal, semi-final, and final) became

their bout 13<sup>th</sup>, to 16<sup>th</sup>, respectively. The athlete had been training with the current club and coaching team for less than six months.

**Participant 6.** Malaki is an amateur boxer with tertiary education and over two years' competition experience. The athlete's competition experience included junior level competitions and over a year of senior competitions. At the time of the study Malaki had been with the club under the same coaching team for at least 12 months. At the start of the intervention the athlete had participated in 10 of the season's 16 inter-club bouts. The National Championship bouts thus became the athlete's 11<sup>th</sup> and 12<sup>th</sup> bouts of the season.

#### ***7.2.5 Participants' Strengths***

Participants' self-talk, personal attributes, and technical strengths identified during preceding studies are depicted in Table 19 below:

**Table 19**

*Intervention Formulation – Participants' Strengths*

<b>Case Study</b>	<b>Self-Talk Strengths</b>	<b>Personal Attributes Strengths</b>	<b>Technical Strengths</b>
1	<p>(1) self-talk use during boxing activities and in other sport prior,</p> <p>(2) belief in self-talk, and</p> <p>(3) acquired self-talk awareness.</p>	<p>(1) awareness of and strengths and limitations in boxing,</p> <p>(2) desire and commitment to performance improvement,</p> <p>(3) adaptability observed during prior studies, and</p> <p>(4) awareness and acknowledgement of coaches' influence.</p>	<p>1) consistent use of punch variations, and</p> <p>(2) consistant use of punch combinations</p>
2	<p>(1) a history of self-talk use prior to joining boxing and during boxing related activities,</p>	<p>(1) awareness and acknowledgement of skill strengths and limitations,</p> <p>(2) commitment to performance improvement,</p>	<p>(1) use of punch combinations,</p> <p>(2) punch power,</p> <p>(3) reach, and</p>

	(2) belief in self-talk, and (3) heightened self-talk awareness.	(3) adaptability observed during the study phases,  (4) awareness and acknowledgement of coaches' influence, and  (5) independence in decision making	(4) proper boxing stance during training and competition.
3	(1) self-talk use during boxing related activities,  (2) belief in self-talk, and  (3) acquired self-talk awareness.	(1) awareness and acknowledgement of skill strengths and limitations,  (2) eagerness and commitment to improve performance,  (3) adaptability observed during the project phases, and  (4) awareness and acknowledgement of coaches' influence.	(1) the use of all three types of punches in both training and competition,  (2) movement,  (3) feinting, and  (4) counterpunching

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4	(1) self-talk use during boxing activities,  (2) belief in self-talk, and  (3) acquired self-talk awareness.	(1) awareness of their limitations in boxing skills,  (2) desire and commitment to improve boxing, and  (3) adaptability demonstrated throughout the project.	(1) punch power, and  (2) reach
5	(1) acquired self-talk awareness,  (2) belief in self-talk, and  (3) self-talk use in boxing activities.	(1) acknowledgement of skill strengths and limitations,  (2) keenness and commitment to performance improvement,  (3) adaptability demonstrated during the project phases,  (4) awareness of coaches' influence, and	(1) punch combinations,  (2) work rate,  (3) follow up during combat,  (4) punch power

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		(5) some degree of autonomy in decision making	
6	(1) self-talk use, (2) belief in self-talk, and (3) acquired self-talk awareness.	(1) awareness of skill strengths and weaknesses, (2) commitment to performance improvement, (3) adaptability demonstrated during the project phases, (4) independence in decision making, and (5) awareness of coaches' influence.	(1) work rate, (2) movement in the ring, and (3) persistence throughout bout rounds.

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### **7.2.6 Measures**

**Targeted Skills.** After thorough consultation (formal and informal sessions) with the coaches about athletes' skills needs the intervention targeted Batswana boxing athletes' offence and defence skills. Specifically, accuracy in three offence skills: straight, hook, and uppercut punches was targeted with the understanding that bout conditions (e.g., type of opponent) often demand switching between punches. The execution of one defence skill, the use of guards was targeted with the coaches explaining that use of guards was generally a major defence weakness for participating boxers.

**Performance.** Punch accuracy performance was calculated as a percentage of punch frequency, being the sum of landed punches and missed punches. Similarly, defense performance was calculated as a percentage of attainable defense use frequency, being the sum of executed defense and defense use missed opportunities. The formula used is illustrated in the data analysis section.

**Manipulation check.** Post sparring and competition tests interview questions (Appendix S) sought to establish: (1) the use of selected self-talk, (2) the use of other self-talk; (3) perceived self-talk belief and awareness; (4) perceived significant other influence and (5) self-ratings on physical weight, focus, distractions, and bout/sparring enjoyment.

### **7.2.7 Procedure**

**Study Permission.** I obtained a research permit from Botswana's Ministry of Youth, Sport & Culture following the University of Botswana's Research Ethics Office recommendation. I also got permission from gatekeepers (BoBA and clubs) to access athletes during training competition.

**Consent.** Participants read the information sheet supplemented by verbal explanation of the study purpose, procedure, and right to withdraw. Thereafter participating boxers signed



consent in duplicate, retaining a copy while the other copy remained for research records (Appendix S).

**Inclusion Criteria.** Boxers were included in the study based on four conditions: (1) being a Botswana citizen boxing athlete and playing the sport in Botswana, (2) aged 18 and above, (3) more than 12 months boxing experience, (4) at least one competition experience, and (5) participation in preceding studies (e.g., self-talk use interview and think aloud studies).

**Rapport Sustenance.** I had established rapport with the athletes and coaches in preceding studies. I maintained rapport in the following practical ways:

- (1) Attended training sessions at least four days a week and attended every inter-club tournament, even when not collecting data,
- (2) Accompanied injured athletes to local health facilities during tournaments,
- (3) Provided psychological or career counselling to athletes when needed,
- (4) Helped facilitate travel and accommodation logistics during tournaments,
- (5) Aailed video recordings to athletes when requested,
- (6) Organised venue and necessary equipment (e.g., projector) for post competition team feedback sessions,
- (7) Volunteered to keep time during training as and when needed,
- (8) Printed and posted copies of the weekly training programme in the gym, and
- (9) Designed and provided a hard copy of daily weight recording sheet at the gym.

#### **7.2.8 Pre-Intervention**

**Sparring Baseline.** Although sparring baseline measurements commenced in September, recordings captured in September were discarded following a weeklong training disruption. The disruption was due to the University mid-semester break and Independence holidays. Training disruption had potential to affect performance due to a drop in fitness

level. Sparring baseline measures were therefore restarted mid-October, lasting a month. In collaboration with coaches, data collection schedule was flexible to accommodate availability of participants and their sparring partners without compromising normal training and tournaments preparations. Where sparring baseline schedules were hindered by academic or work commitments, coaches adjusted the schedule for concerned athletes. Ten boxers completed sparring baseline phase, but one athlete's recordings were later excluded for ethical reasons. On average two sparring baseline sessions were recorded for each participant.

**Competition Baseline.** Competition baseline recordings took place during interclub competitions over three months commencing in mid-August ending early November. Ten boxers completed the competition baseline phase, but recordings for one participant were excluded for ethical reasons. On average two competition baseline bouts were recorded for each participating boxer.

### ***7.2.9 Pre- and Post-Intervention***

**Performance Scoring.** I learnt to differentiate types of punches, punch frequency, and accuracy. I practiced scoring targeted skills using two bouts. Practice scores were compared to that of two coaches to ensure accuracy in my scoring. Thereafter I manually scored baseline recordings by counting the number of executed punches (e.g., hooks) and the number of punches that landed (accurate). Thereafter accuracy and guards use performance was scored using the formula indicated in the section above. The same was done for post-tests recordings. A software engineer graduate also assisted me with the manual scoring of both pre- and post-test recordings, including recordings I had scored. I also randomly re-scored half the recordings scored by the graduate to compare scores and ascertain scoring accuracy.

### **7.2.10 Intervention**

**Introduction Session.** Session one entailed explaining the intervention purpose, process, and settings to athletes. Due to work and academic commitments session one was presented to athletes in three separate groups: four athletes, two athletes, and one athlete. The following piloted instructions guided session one, explain: (1) self-talk and its use; (2) the intervention purpose and process, manipulation check, and post study feedback; (3) the link between the baseline phase and the intervention; and (4) contexts for self-talk use practice (normal training) and post-test recordings (sparing and competition).

**Planning Session.** Immediately after the introductory session I met athletes individually to discuss their intervention plan. For the athlete seen alone, the introduction and planning occurred in one session. The planning session entailed: (1) ascertaining that the athlete understood what was shared in the introductory session; (2) conversing about the purpose of the pre-intervention sparing and competition videos recordings; (3) showing the individual diagrams depicting their baseline performance; and (4) facilitating discussion about self-talk use and self-talk selection to improve baseline performance for targeted skills.

**Self-talk Selection.** Research found self-talk to influence performance regardless of athletes selecting cues on their own, from a list provided by researchers, or when guided by examples (Hatzigeorgiadis et al., 2011; Tod et al., 2011). During the planning session boxers decided on self-talk cues they would use to improve their offence and defence skills baseline performance. In some instances, I guided boxers in cues selection either by: (1) showing the individual self-talk cues and phrases from their own reported and recorded self-talk; (2) asking questions pertaining to comments made by coaches and teammates during training, competition, and feedback session, or (3) recapping on the coaching behaviour interview study (examples in Appendices). Table 20 below shows resultant self-talk cues and phrases for targeted offense and defense skills.

**Table 20**

*Intervention Objectives, Targeted Skills, and Selected Self-Talk*

Participant	Targeted Skills and Self-talk Cues			
	Offense Skills – Accuracy		Defense Skills – Increased Use	
	Straight Punches	Hook Punches	Uppercut Punches	Guards
1	“Jab” “jab to score” “target” “attack”	“hook” “target” “attack”	“uppercut” “target” “attack”	“guards” “guards up”
2	“Jab” “counter” “right (two)” “target” “combine” “attack”	“Hook to the head” “target” “combine” “attack”	“Uppercut to the chin” “target” “combine” “attack”	“guards” “tight guards” “block”
3	“Jab to score” “jab” “target” “combination” “pick target” “counter”	“hook on target” “target” “combination” “pick target” “counter”	“uppercut to score” “target” “combination” “pick target” “counter”	“guards up”

4	“jab to score” “on target”  “target” “score” “attack to score”	“hook” “on target” “target”  “score” “attack to score”	“uppercut” “on target”  “target” “score” “attack to score”	“guards” “guards up”
5	“Jab” “counter” “on target”  “combine” “attack” “follow”	“Hook on target” “hook”  “on target” “combine” “attack” “follow”	“Uppercut to the chin”  “uppercut” “on target” “combine” “attack” “follow”	“guards”  “tight guards”
6	“Target”, “attack”, “jab”,  “two”	“Hook”, “target”, “attack”	“five”, “target”, “attack”	“Guards”, “guards up”

### **7.2.11 Post-Intervention**

**Sparring Post-tests.** Five participants took part in post intervention sparring tests having had an average of seven practice sessions. For four participants, practice sessions included competition post-test bouts (e.g., preliminary, quarterfinals, and semi-final participation).

**Competition Post-tests.** Four participants had four practice sessions before competition post-test 1. When participants progressed to the next competition rounds (e.g., preliminaries to quarterfinals, quarterfinals to semi-finals, and semi-finals to finals) preceding bouts counted as self-talk practice for ensuing bouts.

**Manipulation Check.** After sparring and competition post-tests performances I interviewed each participant to establish: Post sparring and competition tests interview questions sought to establish: (1) the use of selected self-talk, (2) the use of other self-talk; (3) perceived self-talk belief and awareness; (4) perceived significant other influence and (5) self-ratings on physical weight, focus, distractions, and bout/sparring enjoyment.

**Post-Study Feedback Interviews.** Within a week of completing the intervention each participant was invited for a semi-structured interview to give feedback on the PhD project including the intervention phase. The feedback interview questions pertaining to the intervention focused on participants' perceptions of whether the intervention worked for them and to what degree it did.

### **7.2.12 Data Analysis**

Microsoft Word and Microsoft Excel spreadsheet were used to record targeted offense and defense performance scores for both pre- and post-tests. Participants' accurate uppercut, straight, and hook punches were subtracted from corresponding frequency (executed) scores. Thereafter accuracy percentages for each punch type were calculated. For instance, to

establish hook punch accuracy the percentage of landed hooks over hook punches frequency was calculated as in the example formula below:

$$\frac{\text{Landed Hook Punches}}{\text{Hook Punches Frequency}} \times 100 = \text{Hook Punches Accuracy\%}$$

The sum of executed guards and guards use missed opportunity made up the attainable guards use frequency and this was similar in avoidance defence. Thereafter defense performance percentage for guards (hand defense) use and avoidance defence were calculated for each round. For example, the percentage of executed guards scores over attainable guards use scores was calculated as in the formula below:

$$\frac{\text{Executed Guards Score}}{\text{Attainable Guards Use Frequency}} \times 100 = \text{Guards Use Performance\%}$$

The scores in percentage were then averaged, resulting in percentages average. A higher post-test percentage average compared to pre-test indicates improvement in punch (straight, hook or uppercut) accuracy and in effective use of guards, and therefore, considered as evidence for self-talk use effectiveness . A lower post-test percentage average means performance deteriorated and therefore evidence for possible ineffectiveness of the intervention. Similar pre- and post-test percentage average will indicate that self-talk intervention does not hamper performance. Tables and figures were then generated depicting



performance mean percentages for each participant's offense and defense skills in sparring and competition (pre- and post).

### 7.3 Results

The intervention's objective was to improve athletes' accuracy during straight, hook, and uppercut punches. The intervention also sought to enhance athletes' use of guards to defend. This section opens with objective data followed by subjective data, which includes intervention feedback and manipulation check findings, respectively.

#### 7.3.1 *Objective Data*

**Offense Data.** Table 21 below depicts offense performance percentages means for the six participants in sparring and competition settings. Pre- and post-test performance percentage means were calculated from at the most, six rounds of sparring (two sparring) and six rounds of competition (two bouts). The number of rounds differed for individual participants depending on progression in the Championship rounds and/or whether the bout was stopped in earlier rounds.

**Table 21***Offense Performance Means in Percentage*

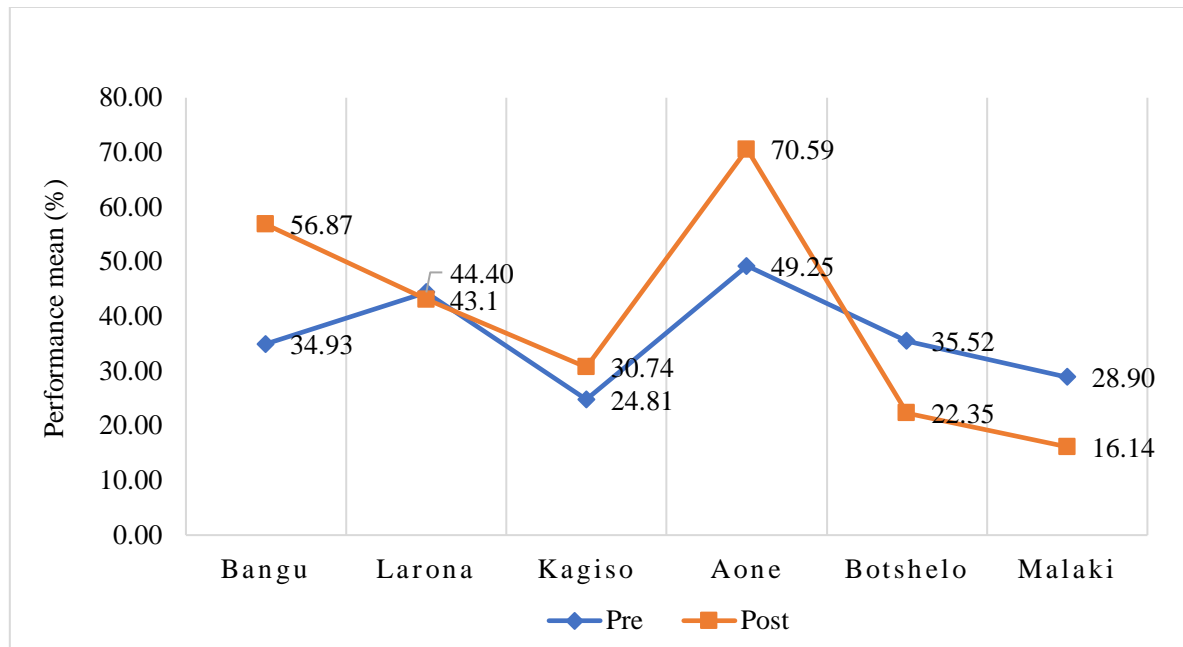
Setting	Type of Punch	Test	Performance Means (%)					
			Bangu	Larona	Kagiso	Aone	Botshelo	Malaki
<b>Sparring</b>	Straight	Pre	34.93	44.4	24.81	49.25	35.52	28.9
		Post	56.87	43.1	30.74	70.59	22.35	16.14
	Hook	Pre	55.89	51.51	28.79	-	41.41	48.75
		Post	84.21	46.92	53.27	-	43.78	20.55
	Uppercut	Pre	74.08	56.58	59.52	-	-	-
		Post	91.77	56.98	27.37	-	-	-
<b>Competition</b>	Straight	Pre	-	45.29	13.84	48.47	45.33	47.43
		Post	-	49	28.41	72.62	27.62	40.41
	Hook	Pre	-	29.49	43.73	18.12	43.47	25.92
		Post	-	47.32	59.02	47.5	41.8	52.93
	Uppercut	Pre	-	43.73	37.21	-	8.33	-
		Post	-	59.02	83.33	46.94	41.8	-

Note: a dash indicates that the participant did not execute the technique and therefore there is no performance score.

Figures 12 (sparring) and 13 (competition) below show improved or sustained straight punch accuracy for four participants in both sparring and competition settings. Also, the figures indicate reduced straight punch accuracy for two participants, in both settings.

**Figure 12**

*Sparring Straight Punch Performance*



**Figure 13**

*Competition Straight Punch Performance*

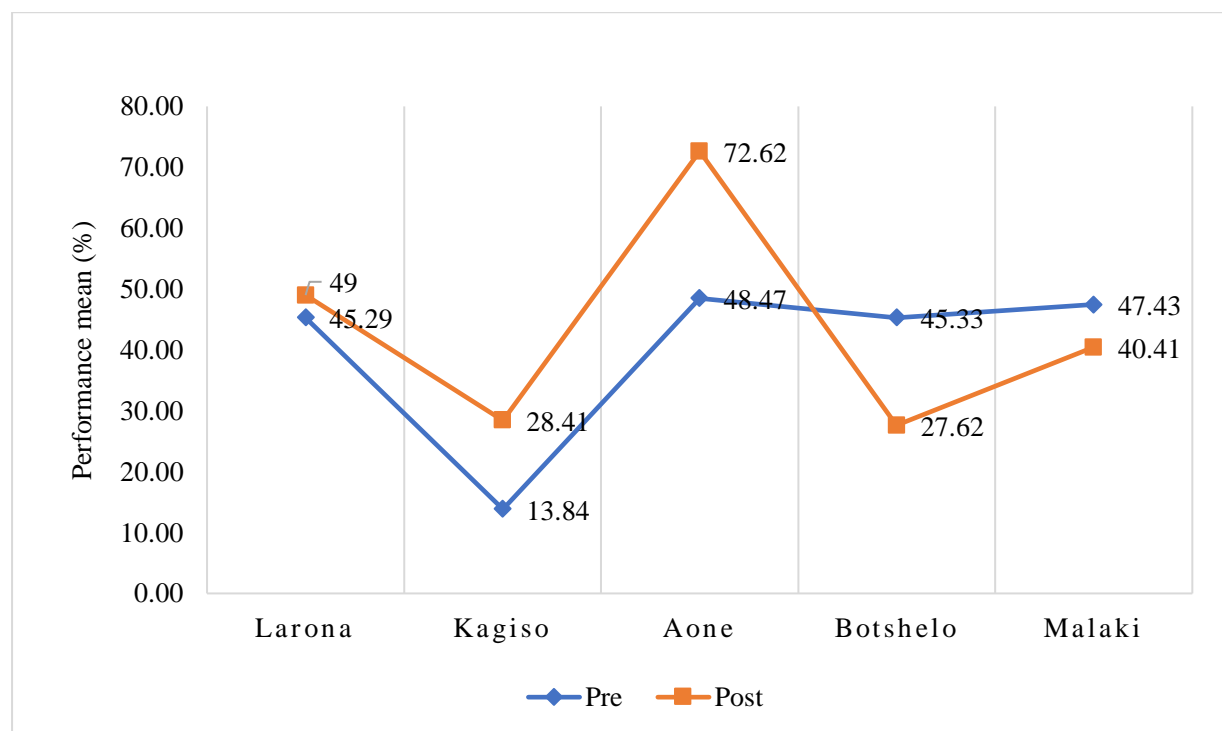
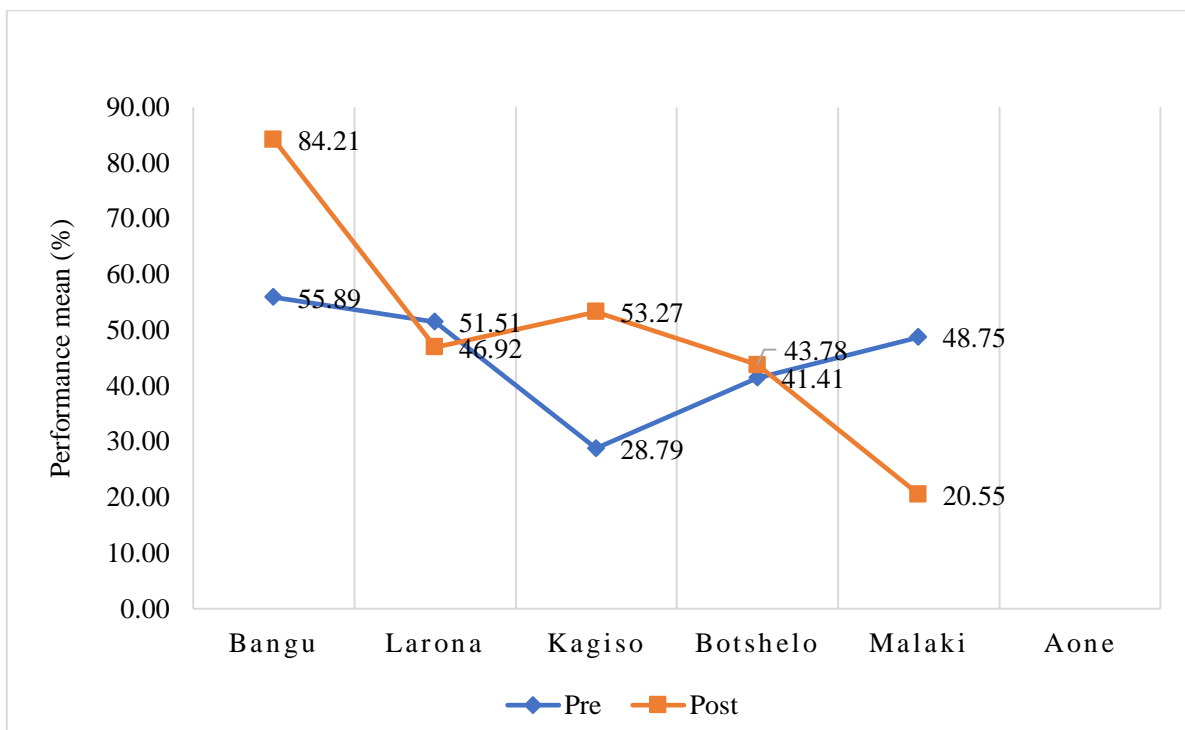


Figure 14 below shows improved or sustained hook punch accuracy in most participants, during sparring. A noticeable deterioration in hook punch accuracy during sparring is indicated for one participant. Competition post-test results in Figure 15 (below) depicts improved hook punch accuracy for all participants (5) who competed in the National Championship.

**Figure 14**

*Sparring Hook Punch Performance*



**Figure 15**

*Competition Hook Punch Performance*

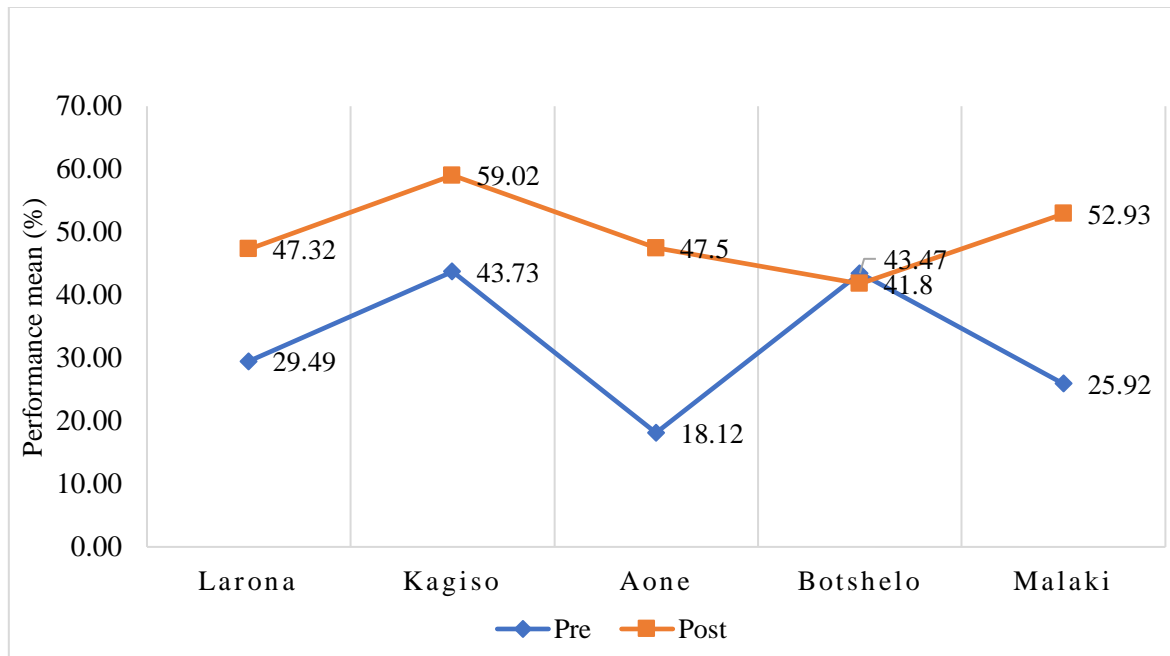
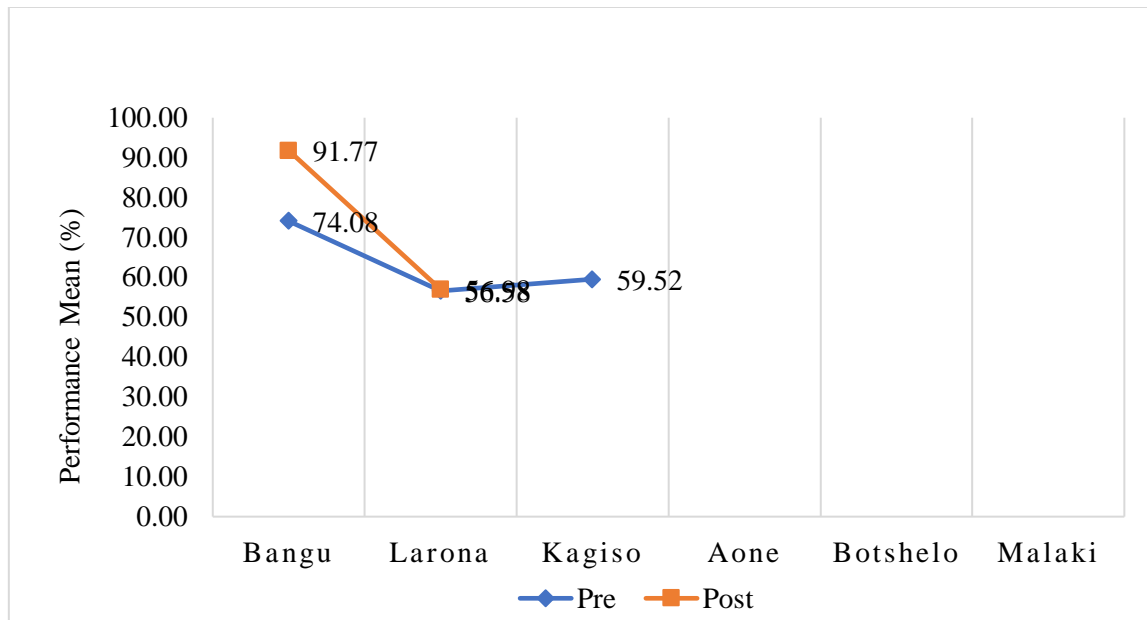


Figure 16 below indicate that only two participants used uppercut punches in sparring. The two participants improved or sustained uppercut punches accuracy post-test. The figure shows that one participant used uppercuts with some accuracy post-test, but there is no pre-test data for comparison. Three participants did not use hook punches in both sparring pre- and post-test. Competition data below (Figure 17) shows improved uppercut punch accuracy in three participants and the use of uppercuts with accuracy in one of the participants who did not use uppercuts pre-test. .

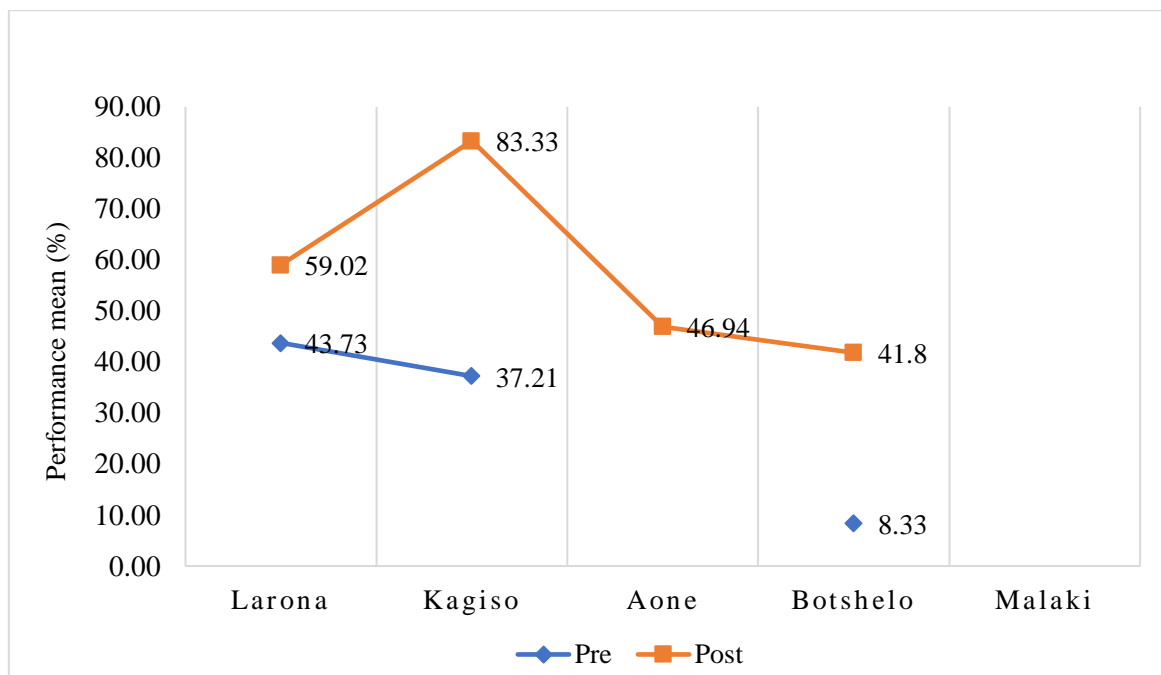
**Figure 16**

*Sparring Uppercut Punch Performance*



**Figure 17**

*Competition Uppercut Punch Performance*



**Defense Data.** Table 22 below shows defence performance percentage means for the six participants in sparring and competition settings. Pre- and post-test performance percentage means were calculated from at the most, six rounds of sparring (two sparring) and six rounds of competition (two bouts). The number of rounds differed for individual participants depending on progression in the National Championship rounds (preliminaries, semi-finals, and finals) and/or whether the bout was stopped in earlier rounds.

**Table 22**

*Defense Performance Means*

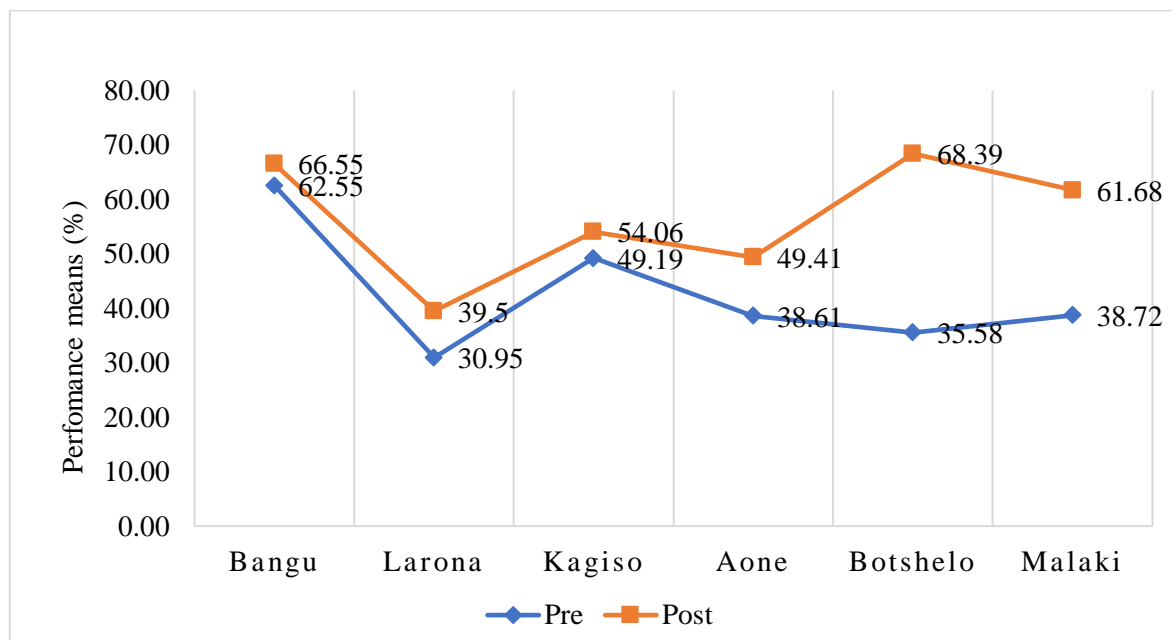
Setting	Type of Defense	Test	Performance Mean (%)					
			Bangu	Larona	Kagiso	Aone	Botshelo	Malaki
Sparring	Guards	Pre	62.55	30.95	49.19	38.61	35.58	38.72
		Post	66.55	30.5	54.06	49.41	68.39	61.68
	Avoidance	Pre	37.78	33.85	37.79	55.76	-	-
		Post	33.49	45.21	37.79	57.86	-	-
Competition	Guards	Pre	-	50.94	38.93	8.34	11.15	31.68
		Post	-	65.97	56.36	49.06	61.3	41.85
	Avoidance	Pre	-	40.63	77.32	-	-	-
		Post	-	52.39	80.26	-	-	-

Note: a dash indicates that there was no performance score for the target technique

Figure 18 and 19 below indicate effective guards use improvement post-intervention for all participants, in both sparring and competition settings. Figures 20 and 21 (below) show sustained use of avoidance defence among participants who executed the technique in sparring (4 participants) and mixed results in three participants who executed avoidance defence in competition.

**Figure 18**

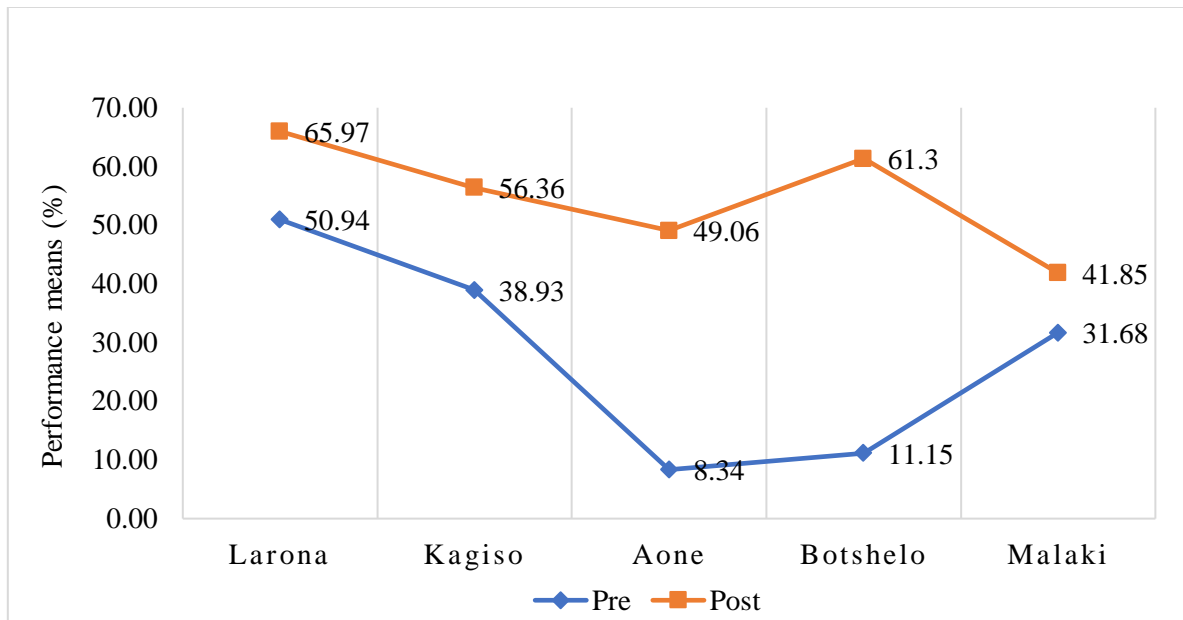
*Guards Defense Performance in Sparring*





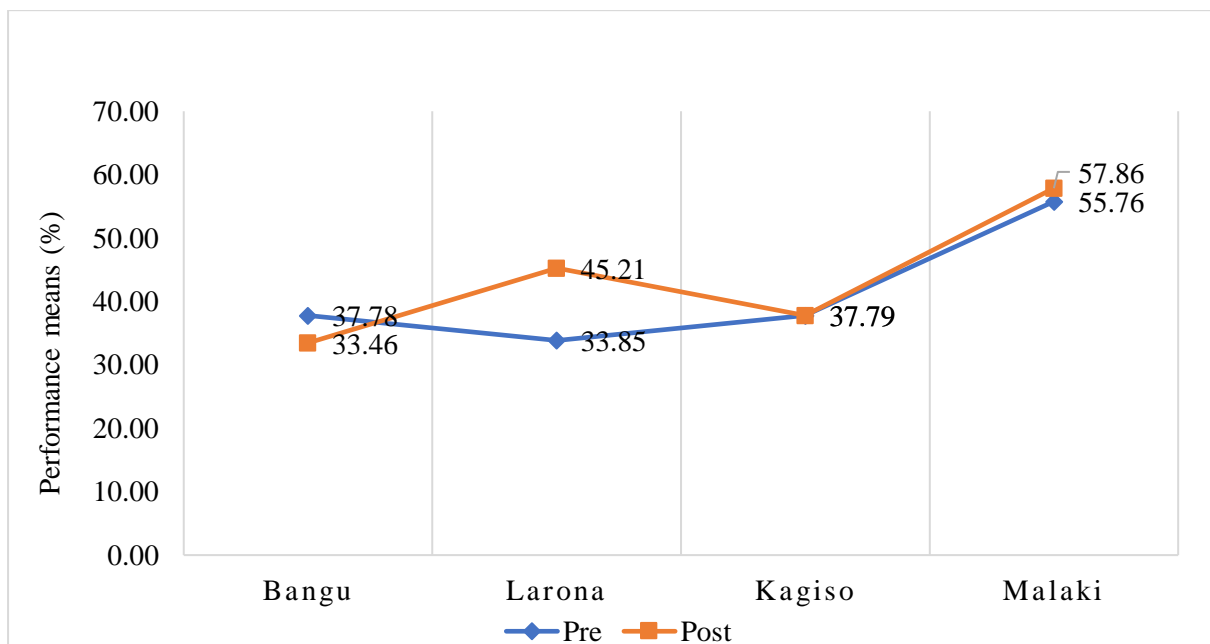
**Figure 19**

*Guards Defense Performance in Competition*



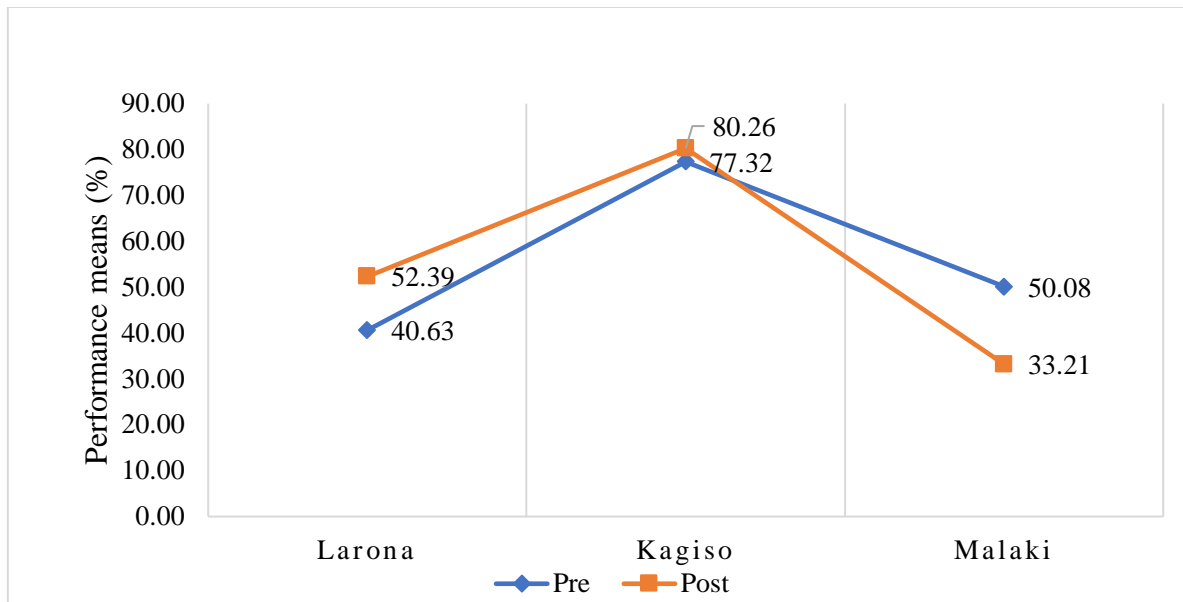
**Figure 20**

*Avoidance Defense Performance in Sparring*



**Figure 21**

*Avoidance Defense Performance in Competition*



**7.3.2 Subjective Data**

Subjective performance data comprise participants' feedback regarding the usefulness of the intervention and the manipulation check results. Manipulation check interviews targeted the following variables: (1) the use of selected self-talk and other self-talk; (2) self-talk belief and helpfulness; and (3) self-ratings on physical weight, focus, distractions, and bout/sparring enjoyment. Intervention feedback quotes and manipulation check findings are presented for each participant.

**Case Study 1.** Participant in this case goes by pseudonym Bangu.

**Intervention Feedback.** Quotes below depict Bangu's perceptions regarding the intervention, helping give a picture beyond what can be highlighted by ensuing objective performance data.

*“Yes, before I was just punching because there is jab, there is an uppercut, there is a hook, I would just throw them, but then with self-talk I see that when I say ‘uppercut’ when I see that uppercuts are not working I have to change, if a hook works I throw a jab and then hook...I realised that the jab opens up spaces but before I didn’t use it, I would just wait for the opponent for her to punch and then I work, but I realised that if you tell yourself, “X jab” then you open up spaces, you are able to throw other punches and you become free.”*

*“I kept hearing your voice saying, ‘look for spaces’, I did that and I felt that it really worked. The uppercuts were landing, as I said ‘jab’, when I fainted I did and said, ‘then you move inside and use uppercuts,’ yeah... It really helped, so from now on, I believe I will work more on looking for space because one doesn’t tire easily, I didn’t get tired really, but I worked.*

**Manipulation Check.** Bangu won the Championship final bout by walk-over (opponent did not show), thus there was no competition post-test. Manipulation check was conducted for sparring post-tests and findings and evidence of self-talk use are shown in Table 21 below:

**Table 23**

*Manipulation Check*

Setting	Intervention	Evidence	Other	Evidence	Belief	Self-Rated Variables (0 = lowest; 10 = highest)						
	Self-talk Use		Self-talk			Useful	Distraction	Focus	Enjoyment	Motivation	Physical Health	
Sparring 1	√	“Bangu attack moving forward” “uppercut” “jab”, “guards”	√	Move, move in, Bangu move “keep calm”	√	7	5	5	7	8	7	
Sparring 2	√	“hook to turn” “Bangu jab” “jab” “guards” “uppercut” “hook”	√	“calm down” “keep calm” “go” “come back and regroup” “keep going Bangu”	√	8	2	8	8	8	9	

**Case Study 2.** Participant is referred to by pseudonym Larona

**Intervention Feedback.** Quotes below depict Larona's perceptions regarding the intervention, helping give a picture beyond what can be highlighted by the ensuing objective performance data.

*"(laughs) no, I was aware of that, I was aware that I tend to think a lot of things at the same time...I feel that even though we discussed it [self-talk] was already something that I was using so it wasn't difficult, it was just to add on."*

*"Yeah, the process [intervention] worked for me, I would give it a 9 [out of 10]. I mean, I won the Championship. I beat the defending champion."*

*"The only self-talk I would say I used more is that 'I have to go out there, I have to prove myself that I am a legitimate boxer too'. I thought that was quite an opportunity for me to do that because I was fighting a famous or popular boxer...it was the strategy for the entire fight, that I have to go out there and show and make sure what I can do'...The coaches were more tactical...for me the self-talk was not tactical, it was just motivational, motivation-wise or drive, the tactical aspect was covered by the coach...it was just about heart, having that desire to win..."*

**Manipulation Check.** Larona won the semi-final bout by technical knockout (TKO) in round two and won the finals bout by unanimous decision (3-0). Post-test interviews were carried out after each bout and two sparring post-tests. Manipulation check findings and evidence of self-talk use are listed in table 22 below:

## Table 24

### *Manipulation Check*

Setting	Intervention	Evidence	Other Evidence	Belief	Self-Rated Variables (0 = lowest; 10 = highest)						
	Self-talk Use		Self-talk		Useful	Distraction	Focus	Enjoyment	Motivation	Physical Health	
Semi-final	√	“combination” “attack” “tight guards”	√	“I have to go out there, I have to prove myself that I am a legitimate boxer too”	√	8	2	8	8	9	7
Final	√	“combination” “tight guards” “attack”	√	“I made it this far, I have nothing to lose” “movement”	√	10	2	8	8	8	8

Sparring√	“hook” “counter” √	“slip”	√	8	3	7	8	6	6
1	with a right”								
	“close guards”								
	“counter”								
Sparring√	“counter” “jab” √	“just have fun”	√	7	4	6	7	5	6
2		“turn”							

**Case Study 3.** Participant is given the pseudonym Kagiso.

**Intervention Feedback.** Quotes below depict Kagiso's perceptions regarding the intervention, helping give a picture beyond what can be highlighted by the ensuing objective performance data.

*"If you observed, most of my punches landed on target, I told myself that my target has to be perfect, 'target, target, target', I have started saying 'target, target, target', throughout the bout, every time I released a punch I told myself it had to land on target unless I was caught off guard and I released a punch to distract him."*

*"Self-talk really worked for me, I really improved, they [self-talk cues] gave me morale. You know that I always struggled with defence, my opponents being taller than me so I knew that I always had to practice jab and defence so whenever I did that I could see that I matched my opponents, even matching my sparring partner who is taller than me. Every day after training I reflected on what was difficult and wrote it down, the next day in training I would be thinking about how training was yesterday, even in shadow boxing I would be saying, 'jab, jab, move, defend,' I practiced and used these, they really worked for me. I give them 10 [out of 10]."*

**Manipulation Check.** Kagiso won the semi-final bout by unanimous decision (3-0) but lost the finals bout by split decision (2-1). Post-test interviews were carried out post each Championship bout and post the two sparring sessions. Manipulation check findings and evidence of self-talk use are indicated in table 23 below:

## Table 25

### *Manipulation Check*



Setting	Intervention	Evidence	OtherEvidence	ST	Self-Rated Variables (0 = lowest; 10 = highest)						
	Self-talk (ST)		ST	Belief	Useful	Distraction	Focus	Enjoyment	Motivation	Physical Health	
	Use										
Semi-final	√	"guards up" "jab" "counter" "hook" "target-target" "uppercut" "counter"	√	"move to the side" "movement" "distract him" "body"	√	8	4	6	7	8	8
Final	√	"jab" "counter" "hook" "target-target"	√	"movement" "body"	√	8	2	8	8	7	7
Sparring 1	√	"hook" "jab" "guards" "target" "counter"	√	"move to the side"	√	7	1	9	8	6	8
Sparring 2	√	"counter" "jab" "guards" "target"	√	"movement" "fast"	√	8	2	8	8	8	8

**Case Study 4.** Participant is given the name Aone.

**Intervention Feedback.** Quotes below depict Aone's perceptions regarding the intervention, helping give a picture beyond what can be highlighted by the ensuing objective performance data.

*"I got to learn that I should not just punch, I have to pick a target...the graph showed me that you don't just need to punch but you need to punch punches that produce results, so when I got to the Championship, the fight before the Championship I lost the fight where you could tell that this person really won the fight if you are watching me, but someone who doesn't know boxing will think I won. I watched the video and I thought that maybe I was just punching so when I went to the Championship, I didn't just throw punches, I threw punches because I was looking for a target knowing that when they land I get to score. Seeing the graph had impact, 10/10. The graph really changed me, if it wasn't for the graph I could have just wasted my energy, using punches that can't even make impact...seeing the graph was really helpful because I am a visual person so if you are just saying it I will just take it like as coach says it in training but when you see it you get on track."*

*"Self-talk worked for me, they really worked for me. The way I was using them, I wasn't just punching, I was punching having evidence that when I went to a person to attack, I want to throw a jab but I can't just throw a jab for nothing, it's either I jab to disturb or I jab to score...self-talk was very useful, I would say 10/10."*

**Manipulation Check.** Aone won the Championship final bout by unanimous decision (3-0). This was the athletes' only Championship bout. Manipulation check was conducted for both competition and sparring post-tests and findings and evidence of self-talk use are shown in Table 24 below:

**Table 26***Manipulation Check*

Setting	Intervention Evidence	Other Evidence	Belief	Self-Rated Variables (0 = lowest; 10 = highest)						
	Self-talk Use	Self-talk		Useful	Distraction	Focus	Enjoyment	Motivation	Physical Health	
Final	√	“on target” “target” “attack to score” “score” “jab” “guards”	√ “punch and guard” “they are open” “follow” “now I can attack” “I’m on it” “jab” “it means I should jab to distract” “I should keep them away” “move” “relax”	√	9	2	8	10	10	9
Sparring	√	“on target” “target”	√ “punch and guard” “jab”	√	9	1	9	9	9	9

**Case Study 5.** The participant is referred to by pseudonym Botshelo.

**Intervention Feedback.** Quotes below depict Botshelo's perceptions regarding the intervention, helping give a picture beyond what can be highlighted by the ensuing objective performance data.

*"Ah, in the first place I asked myself how you were able to do so many things, I didn't think that could be done at all. But then after seeing all that I realised that this is very serious, yes. Also, that was very helpful, it showed me where I am good and where I need to improve, which of my punches are good and so forth."*

*"I can give it [usefulness of baseline discussion] 10/10, and I feel that this is accurate, I take it that you watched the video quite a lot, reversing from time to time to really see what was happening...very much [helpful] because after watching the graphs which showed how many hooks landed, how many straight punches landed, how many uppercuts landed I noted which punches will work for me in a fight."*

*"(laughs) it became easy because I knew that the following week was Botswana Games so I made sure that I practised these [self-talk cues] a lot so that I get used to them."*

**Manipulation Check.** Botshelo won two of the competition bouts (preliminary and quarterfinal) by technical knockout (TKO), one bout (semi-final) by unanimous decision (3-0), and the finals bout by split decision (2-1). Manipulation checks were conducted post Botshelo's semi-final bout, finals bout, and the two post-test sparring sessions. Manipulation check findings and evidence of self-talk use are shown in table 25 below:

**Table 27**

*Manipulation Check*

Setting	Intervention	Evidence	Other Evidence	Belief	Self-Rated Variables (0 = lowest; 10 = highest)					
	Self-talk		Self-		Useful	Distraction	Focus	Enjoyment	Motivation	Physical Health
	Use		talk							
Semi-final	√	“target” “guards up” “uppercut” “hook”	√ “keep him inside” “perfect punches” “this southpaw” “I have to win this fight”.	√	8	1	9	8	10	8
Final	√	“combination” “tight guards” “attack” “on target” “hook on target” “uppercut”	√ “movement” “perfect punches”	√	9	2	8	10	10	9

Sparring√	“hook” “counter” √	“slip” “rotate” √	8	3	7	8	6	6
1	with a right”							
	“close guards”							
	“counter”							
Sparring√	“counter” “jab” √	“have fun” √	7	4	6	7	5	6
2	“hook”	“turn”						
	“uppercut”							



**Case Study 6.** The participant is given pseudonym name Malaki.

**Intervention Feedback.** Quotes below depict Malaki's perceptions regarding the intervention, helping give a picture beyond what can be highlighted by the ensuing objective performance data.

*"Yes [it helped performance], of course yes ma'am because most of the time I remembered that I usually just punch, in my punching just hitting guards and that not benefitting me, so most of the times I punched and moved to the sides, I punch so that I look for target while he is still facing the other sides, when he is following me I go the opposite direction and punch again, so that is the way I looked for target because the person I played during the championship was tall so most of the time when I punched him he guarded and caught me so I had to I had to move to the sides, move a lot looking at the target so that I don't just punch without a goal."*

*"According to me I would give it [rating intervention helpfulness] 10/10 because when I observe the boxer I played against in the championship, he is the most skilful, he is in the national team and he played in the national team several times...he has more experience than me. When I consider all these things and that at the end of the bout I ended up losing 2-1, according to me if I had not seen this chart, if there was no self-talk...maybe the fight would have been stopped or he would have beaten me 3-0. The truth is it benefitted me a lot. Also, in the quarterfinal my win was anonymous decision, 3-0, which shows that I played satisfactorily."*

**Manipulation Check.** Post-test interviews were carried out following each post-test: quarterfinal, semi-final, and sparring. It is worth noting that Malaki had a recurring knuckle injury, which resurfaced during the quarterfinal, worsening in the semi-final (before sparring post-test). Nonetheless the athlete reported bouts enjoyment despite different outcomes.

Malaki won quarterfinals by unanimous decision (3-0) and lost in the semi-final by split decision (2-1). The second sparring test was cancelled due to a knuckle injury. Malaki's manipulation check findings and evidence of self-talk use are indicated in Table 26 below the quotes.

## **Table 28**

### *Manipulation Check*

Setting	Intervention Evidence	Other Evidence	Belief	Self-Rated Variable (0 = lowest score; 10 = highest score)							
	Self-talk Use	self-talk		Useful	Distraction	Focus	Enjoyment	Motivation	Physical Health		
Semi-final	√	“Attack”, “jab”, “two”, five”, “guards up”	√	“Move to the side”, “punch and turn”	√	9	3	7	8	10	9
Quarterfinal	√	“Attack”, “jab”, “two”, “guards up”	√	“Move to the side”, “punch and turn”, “move to the left”, “use speed”	√	9	0	10	10	10	8
Sparring	√	“Attack”, “jab”, “guards up”	√	“Move to the side”	√	10	5	5	6	6	5

## 7.4 Discussion

The intervention aimed to improve athletes' accuracy in straight, hook, and uppercut punches during competition and sparring. Furthermore, the intervention endeavoured to augment athletes' use of guards during competition and sparring. Generally, the tailored skill-targeted self-talk intervention proved effective in augmenting accuracy in the different types of punches the boxer during sparring and competition. In instances where athletes did not use or inconsistently executed punches before the intervention, use thereof was heightened post intervention, with noteworthy accuracy. Punch accuracy improvements were more evident in competition than in sparring settings. On very few instances accuracy deteriorated, there was limited data to determine impact, or post-intervention patterns were inconclusive.

Besides benefits to offence techniques, the intervention improved athletes' guards use in the two real world settings. Where athletes did not execute guarding skills before the intervention, use thereof post-intervention was evident, pointing to the effectiveness of self-talk intervention in encouraging skill execution. Although avoidance defense skills were not targeted, pre-intervention use thereof was sustained after the intervention. Furthermore, the club and participants achieved their individual and group goals of winning individual medals and the club being crowned 2017 National Champions. Participants deemed the intervention useful and to have benefitted their performance. This perception was echoed even when participants lost a bout.

Current findings support abounding evidence for the beneficial effects of self-talk intervention on sporting performance (e.g., chapter 3; Abdoli et al., 2018; De Matos et al., 2020; Hatzigeorgiadis et al., 2011; Hatzigeorgiadis et al., 2018). Further, the findings add to limited proof that self-talk interventions benefit sport performance in the real world (e.g., Hatzigeorgiadis et al., 2014). Current findings provide initial evidence that tailored skill-

targeted self-talk interventions can benefit specific boxing offense and defense skills real world training and competition. That the intervention improved offense and defense skills simultaneously and in the process did not hamper untargeted skills (e.g., avoidance defense) point to the potential of tailored skill-targeted self-talk interventions in benefitting holistic performance. This assumption is backed by participants' Championship results. Yet, further tailored skill targeted intervention studies are paramount to test assumptions made herein and shed light on how tailored skill-targeted interventions benefit and/or do not harm targeted and untargeted skills.

Although the intervention comprised instructional self-talk. Athletes reported using self-talk classified as motivational. The benefits of self-talk on specific sporting goals include accuracy (e.g., Abdoli et al., 2018; Wallace et al., 2017) and skill execution (e.g., Boubaki & Perkios, 2014a; Zetou et al., 2014b). Several studies reported the beneficial impact of instructional self-talk on accuracy (e.g., Abdoli et al., 2018; Wright et al., 2016), and others demonstrated evidence for motivational self-talk on the same (e.g., Chang et al., 2014; Hardy et al., 2015). Self-talk likely augmented performance through its influence on different motivational mechanisms and cognitive mechanisms such as concentration. This explanation finds support in Hardy et al.'s (2009) framework for the study of self-talk in sport, which proposed cognitive and motivational mediating role in the relationship between self-talk and performance. Limited research has suggested the role of motivation in mediating the effects of self-talk on performance (e.g., Goudas et al., 2002). Still, given reported high levels of motivation in post-test interviews when athletes stated adding motivational self-talk to intervention self-talk, the mediating role of motivation seem likely. Even more given that in an earlier study (Chapter 4) participants reported the benefits of self-talk to motivation variables such as effort and confidence. Still, further intervention studies measuring

motivation will shed more light on the role motivation plays in the self-talk and performance association.

Several studies reported the role of attentional focus in explaining the self-talk and performance relationship (e.g., Galanis et al., 2018; Wright et al., 2016; Zetou et al., 2014). Unlike laboratory settings, real world settings are not controlled, athletes perform in unregulated environments. Real world conditions therefore place demands on athletes' concentration. In a sport where inflicting pain on each other is part of the game there is need for heightened focus on task-pertinent stimuli without losing focus of other factors (Pedro & Durbin, 2011). Current findings imply the beneficial effects of self-talk in helping boxers to focus on task-relevant stimuli (e.g., opponent's attack move and speed, and attack opportunity against the opponent) during offense and defense, despite uncontrolled circumstances. In fact, post-test interviews noted reports of being very focused, particularly during competition. The post-test interviews findings echo findings in an earlier study (Chapter 4) in which athletes reported that self-talk facilitated their focus. That said, motivational and cognitive mechanisms interpretations are cautiously made because the current study did not objectively measure said mediating variables.

Possible explanations for unimproved performance in some targeted skills are noted. Firstly, unclear patterns in accuracy improvement could be indication that some self-talk cues were ambiguous. For instance, unimproved accuracy in straight punches could be because jab punches have a versatile function, they can be used to attack or defend. Athletes may have used jabbed with intent to disturb and keep the opponent away (defence) rather than to score, explaining the observed lack of improvement or decrease in straight punch accuracy. This possibility was overlooked during cue selection and verification of athletes' intent during scoring was beyond the scope of this project. Besides jabbing, other self-talk may have not

been precise enough, enhancing skill use in general rather than honing accuracy. For instance, using cue words “uppercut” or “hook” instead of the phrase “uppercut on target” or “hook to score” was probably less effective. Moreover, the phrase “tight guards” was likely more effective than cue word “guards”. Secondly, in some cases unclear patterns of performance improvement resulted from lack of opportunities to play more bouts or having the bout finish early. Although lack of opportunities to play, playing fewer bouts, and bouts ending too soon are usually real-world factors beyond the athlete’s control, constructing unambiguous and precise self-talk cues competition can be avoidable. Future research would do well to take heed.

Lastly, offense and defense techniques possibly differed in degrees of accuracy and/or frequency because of what Hardy et al., (2009) termed self-talk antecedents. Specific self-talk antecedents likely influenced the self-talk athletes preferred to use on the occasion. Based on pre intervention needs assessment, post-test interviews, and post-intervention feedback interviews personal factors and situational factors influenced athletes’ self-talk. Likely personal factors include: (a) fitness (e.g., injury); (b) experience, and (c) skill strength or weakness. Situational factors that more likely influences self-talk preference include: (a) opponent’s skill level; (b) opponent’s experience; (c) bout circumstance/progress (e.g., referee count); (d) coaching instructions; and (e) the audience and teammates. The aforesaid antecedents possibly resulted in a diversion from planned self-talk or reduced the degree to which planned self-talk was used. Consequently, targeted skill was executed to the same degree. Further research directly investigating specific self-talk antecedents’ and performance would be enlightening. This explanation is reasonable given that stated antecedents harmonise with findings in preceding studies (chapters 4 and 6), which reported participants

perceived personal (e.g., fitness) and situational self-talk antecedents (e.g., coaching behaviour).

The self-talk intervention benefitted all participants regardless of differences in skill and experience level. This may seem to contradict existing research (e.g., Hatzigeorgiadis et al., 2011), however, previous studies compared skilled athletes with novice athletes. The current study participants were semi-skilled and skilled. Studies which reported greater benefits among novice than skilled athletes were mostly conducted in controlled settings rather than in the real world. Whether in the real-world self-talk interventions would benefit novice more than skilled athletes necessitates further research. That said, the current study was not a comparison study, but rather focused on benefits of the intervention to individual athletes' performance. Besides, previous interventions were not tailored and skill targeted for each athlete, limiting comparability of current findings to previous studies on whether skill and experience level play a moderating role. Perhaps in real world settings and when interventions are tailored to athletes' skills needs, the mediating role of experience and skill level may not be observed. Indeed, these explanations are made with caution because neither experience nor skill level were variables under investigation. Still, current findings provide initial evidence to the benefits of self-talk intervention among boxing athletes of varying skill and experience level when self-talk interventions are tailored, and skill targeted. All participants reached podium stage, most were crowned champions, and many outperformed defending champions. These facts strengthen evidence that the tailored skill targeted self-talk intervention is beneficial to Botswana boxers' skill execution, regardless of skill and experience level.

Levels of impact the intervention had on different targeted skills among participants despite varying skill and experience level, may be explained by the athletes' engagement.



Participants' engagement, which has been linked to desirable results in psychotherapy was reflected in the boxers': (1) involvement in selecting intervention self-talk and choosing to use additional self-talk cues during sparring and competitions; (2) attendance of intervention related activities (e.g., pre-and post-tests, planning sessions, and post-test interviews); and (3) voluntarily practicing selected cues (Holdsworth et al., 2014). Skill and experience level aside, without participants' engagement the intervention would not have been tried, and the potential of the implemented tailored skill targeted intervention in augmenting performance would remain unknown. Another suggested engagement element which may have contributed to the intervention success is what in psychotherapy is termed the therapeutic relationship. Possibly, the therapeutic alliance plays a role in participants' intervention focused behaviours and efforts invested in intervention activities towards goal achievement (Holdsworth, et al., 2014). In fact, research has indicated the role of the therapeutic alliance on predicting intervention attendance (e.g., Lecomte et al., 2012; VanDeMark et al., 2010) and participation (Boardman et al., 2006; Lecomte et al., 2012). Holdsworth et al. (2014) thus suggest that it may be more useful to regard the therapeutic alliance as a vital determinant of rather than a component of engagement. The possible significance of the therapeutic relationship necessitates the practitioner's intentionality in facilitating the development and nurturing thereof.

The current study processes are worth mentioning and may shed more light on the therapeutic alliance and the possible role thereof in facilitating participants' engagement and consequently intervention outcomes. A research project that spans months runs the risk of participants dropping out either intentionally (e.g., loss of interest and growing weary) or because of circumstances beyond their control (injuries and time constraints). To cultivate and nurture rapport with the goal of mitigating drop out risks I deliberately invested time and

energies taking part in participants' sporting activities. I chose to: (a) attend training sessions most days of the week; (b) attend and/or travel with the team to fortnightly competitions for six months, until the culmination of the season; (c) attended post-competition feedback sessions; (d) accompanied injured athletes to health facilities during competitions; and (e) availed myself to provide psychosocial or career support to the team as per need.

Furthermore, I assisted the club with resources as per need (e.g., projector, video recordings, printed training programme and weight recording sheet weekly, and organizing transport).

These efforts may have communicated the sincerity of my interest in supporting their performance, and instilled trust in the trust in the therapeutic relationship, hope in the potential benefits of the intervention, and encouraged engagement. Indeed, the impact of the aforesaid on mitigating drop out and facilitating the intervention process was not assessed, it is assumed. Yet, given participants engagement - patience with the study processes (e.g., adapting to schedule modifications) and duration (six months), and efforts in using intervention cues, concerted efforts to nurture the therapeutic alliance seem to have paid off. To make solid claims on the role of engagement on intervention effectiveness and convincingly support claims made by psychotherapy literature, future research needs to assess engagement during intervention.

#### **7.4.1 Limitations**

The study had limitations. First, the current study was a single-subject design study and therefore employed a small sample size. From a statistical point the study cannot be generalized. However, for purposes of the current study and the participants' goal, the design was suitable and meaningful. Real world self-talk interventions target individual's skills needs for purposes of enhancing the individual's performance and such interventions do not depend on sample size. It is about the individual, not about the population. This approach is

applicable even in team sport because performance of the whole depends on performance of individuals that make up the team. Targeting individuals' skill needs and planning tailored self-talk interventions ultimately benefit the whole. Another possible limitation relates to the fact that sparring post-test was conducted after the competition post-test (National Championship). Given that sparring is contact training which prepares athletes for competition conducting sparring post-tests after competitions possibly affected athletes' motivation during sparring post-test, and indirectly performance. Perhaps results would have been different for both sparring and competition, competition performance benefiting from opportunities to rehearse self-talk cues more in sparring and sparring benefiting from the motivation to prepare for National Championship. Future research needs to consider the timing of sparring post-test in relation to competition post-tests. Lastly, punch accuracy was not scored by an expert boxing judge, and therefore it is likely that some punches may have been misjudged. Future research will do well to utilize a skilled boxing judge to enhance scoring accuracy.

In conclusion, the tailored skill targeted self-talk intervention has proven some beneficial impact on boxing offense and defense skills in the real world and is not harmful to performance of targeted skills. Moreover, the intervention did not hamper performance in untargeted defense skills, suggesting potential thereof to support holistic performance. The intervention also showed evidence that tailored skill targeted interventions can enhance performance regardless of skill and experience level. The intervention findings suggest the need to ensure unambiguity in cues selected and to facilitate athletes' engagement through nurturance of the therapeutic alliance. The findings also add insights to Hardy et al.'s (2009) framework for the study of self-talk in sport, which will be discussed in the next chapter, concluding the thesis.

## **CHAPTER 8**

### **Synthesis of Findings**

#### **8.1 Introduction**

The thesis entailed a series of self-talk studies conducted among Batswana boxers. The studies were preceded by a review of the literature, which identified several gaps in the literature, informing the direction of the thesis. First, there was need to conduct a systematic review of self-talk intervention studies (Chapter 3) because intervention studies have continued to grow since existing reviews (e.g., Hatzigeorgiadis et al., 2011; Tod et al., 2011). The review would provide an updated status of trends in the self-talk literature and thereby point to imbalance in current research focus and limitations such imbalances potentially present. Explorative studies were then presented in chapters four through seven, investigating Batswana boxers' self-talk use utilising an array approaches, including retrospective recall interviews, think aloud approach, assisted video interviews, and rounding off with an experimental method. The main aim of the thesis was to add to current self-talk and sport performance knowledge and understanding. This overarching aim was driven by five secondary aims: (1) to systematically identify trends in current self-talk and performance intervention studies; (2) to explore Batswana boxing athletes' self-talk awareness, beliefs and uses with intent to inform a tailored skill-targeted self-talk intervention; (3) to investigate Batswana boxing athletes' actual self-talk use in training; (4) to explore Batswana boxers perceptions of coaching behaviour influences; and (5) to investigate the effectiveness of a tailored skill-targeted self-talk intervention among participating Batswana boxing athletes, in training and competition.

This PhD project found inspiration from gaps identified in the self-talk and sport literature on the subject. First, few studies examined skilled and highly skilled athletes

undertaking accuracy, endurance, body movement, speed, endurance outcome tasks. Second, limited studies utilised competition and actual training environments. Third, self-talk research in sport is yet to capture athletes' actual self-talk during performance, moreover, doing so with intent to inform intervention. Fourth, generally self-talk research has not demonstrated efforts to infuse theory in intervention processes, including formulation, this may partially explain inconsistent findings. Fifth, self-talk intervention findings across task demands remain inconsistent, thus a comprehensive understanding of how self-talk affects sport performance, expanding on moderator and mediator variables, as well as complexities in self-talk interventions. Sixth, there is need for self-talk interventions and self-talk research in general to target athletes from non-western backgrounds. Until then findings remain generalizable to WEIRD populations than the rest of the world.

Seventh, few self-talk intervention and descriptive studies have targeted combat sport, and none have targeted the sport of boxing and boxing athletes. We therefore remain without insight on self-talk use in combat sport, where play involves intentionally inflicting pain, and being on the receiving end of the same. Eighth, self-talk research in sport has not explored the potential of mixed methods approaches, including sequential use of an array of methods in heightening intervention success. Ninth, although efficacy of self-talk interventions has been resoundingly demonstrated, evidence for the usefulness of self-talk strategies in uncontrolled settings (e.g., competition, training) is yet to be established (effectiveness). Finally, tailored skill-targeted self-talk interventions are wanting, limiting insights on practices that could yield desirable results in the real world. This PhD project to a great extent addressed gaps highlighted above.

The project: (1) targeted both skilled and semi-skilled athletes; (2) used real world training and competition settings; (3) captured athletes' actual self-talk; (4) was guided by an

understanding of athletes' self-talk use in light of existing theory; (5) highlighted trends in the literature and pointed to complexity issues; (6) targeted a non-WEIRD population; (7) targeted the sport of boxing and boxing athletes; (8) explored the potential of sequential use of mixed methods; (9) found evidence for self-talk effectiveness; and (10) planned and implemented a tailored skill-targeted intervention. In this and more the project has noteworthy strengths: (1) needs assessment; (2) athletes and coaches' involvement; (3) methodology; (4) participants; (5) rapport (6) Intervention settings (efficacy vs effectiveness); (7) contribution to existing self-talk framework, and (8) opportunity for mental skills (self-talk) introduction and training. These strengths are elaborated on after reviewing the findings.

## 8.2 Review of Findings

The systematic review study (Chapter 3) identified trends in current self-talk and performance intervention studies, some variables (e.g., students and novices participants, assigned self-talk, field or training settings, between subjects designs) remain high on researchers focus list as were in existing reviews (e.g., Hatzigeorgiadis et al., 2011; Tod et al., 2011). Moreover, trends indicate that although individual sports have been researched more than team sport, the list of individual sports so far studied is not exhaustive and has not included the sport of boxing. Furthermore, research on non-western backgrounds remains low in the trends. Trends, and continued reports of improved performance by synthesis review (Hatzigeorgiadis et al., 2011) and individual studies (Abdoli et al., 2018; DeWolfe et al., 2020) necessitate a consideration of interactions between design, context, and implementation variables.

The retrospective interviews study (Chapter 4) found that Batswana boxing athletes reportedly utilize self-talk during various boxing activities, and indicated to believe reported self-talk. Adding to the findings, several participating boxers reported not being of their self-

talk use prior to the study. In reports of their self-talk the study found that the boxers' self-talk seemed to be influenced by personal (e.g., fitness, emotions, and belief in self-talk) and situational (significant other and competition circumstances) factors. Emotions were found to be the more prevalent of reported personal antecedents. For situational antecedents, significant others bud-theme coaches influence was the more prevalent, as well as competition context's opponent sub-theme. The thesis further found that similar to early research, the boxers use self-talk that serves motivational and instructional purposes, and that which is positive, negative, and neutral in content. Moreover, the boxers' reported self-talk depicted person and structure characteristics. Precisely, reported self-talk was phrased in first, second or imperative forms, with the latter more prevalent. Structure characteristics of the boxers' self-talk revealed self-talk phrased as cue words, phrases, sentences, and questions. Phrases were used the most. The boxers reported using self-talk for motivational (e.g., morale, confidence, and endurance) performance (e.g., technique and tactic) and for control (e.g., concentration and emotions). The study was able to provide a basis for future study in that athletes already report using and believing the self-talk strategy.

The think aloud study (Chapter 5) confirmed that participating boxers' use self-talk in shadow boxing and punch bag settings. The athletes' recorded self-talk served similar functions (instructional and motivational) as their reported accounts. Moreover, the boxers' self-talk depicted similar person and structure characteristics. Study three however, reported marked prevalence of instructional self-talk in the two settings by far, compared to the retrospective reports findings. The prevalent instructional self-talk primarily comprised technique focused self-talk, with offense-focused self-talk used much more than defense related self-talk. The findings provided evidence that the TA can be used in boxing non-contact setting, conclusions on impact thereof on performance are beyond the scope of the

current study. A further conclusion from the use of the TA is its potential to be used alongside retrospective recall methods as a self-talk needs analysis. Also, the TA results may complement other skill analysis tools such as real life and video observations.

The study on perceived coaching behaviour influences (Chapter 6) found that boxing athletes' self-reports suggest that coaching instructions influence their self-talk during bouts. The influence of coaching instructions on athletes' self-talk seems to be direct and indirect. Indirect in that coaching instructions seem to also influence emotions and behaviour, suggesting interrelatedness between thoughts, emotions, and behaviour. The findings also suggest that both personal and situational factors influence athletes' adherence to coaching instructions. Conducting the study in training settings such as the pad work may have provided more insights on the coaching behaviour influence on athletes' self-talk given that training settings are more interactive compared to competition environments.

The final study of the thesis, the intervention study (Chapter 7) provided evidence that a tailored skill targeted self-talk intervention is effective in improving boxing offense and defense skills in the real world. The study also showed generally a tailored skill targeted self-talk intervention is not harmful to performance of targeted and untargeted skills. This suggests the intervention's potential to support holistic performance. Further, the intervention provided evidence that tailored skill targeted interventions can enhance performance regardless of skill and experience level.



### 8.3 Thesis Highlights

#### 8.3.1 *Strengths*

**Methodology.** The employed a mixed method approach – quantitative, qualitative, and experimental methods. At the initial stages of the project a meta-analysis was conducted (chapter 3) synthesizing existing controlled, randomized self-talk intervention studies. The synthesis phase led to the use of interviews to explore boxing athletes’ self-talk use. Interviews found that athletes do use self-talk and revealed individual and situational factors that influence athletes’ self-talk use (e.g., fitness and coaching behavior, respectively). The think aloud method was used to ascertain athletes’ actual self-talk use during two distinct and important components of their daily training (shadow boxing and punch bag). As follow up to the interview study findings regarding significant other influences, the video and audio assisted interviews explored perceived coaching behavior influences on athletes’ self-talk. The project culminated with a single-subject design method to test the effectiveness of tailored, skilled targeted self-talk interventions on participating boxers. Finally, interviews were used to allow participants to reflect on and give feedback on the project. To my knowledge, no documented self-talk study has employed mixed methods to this degree. The project has shown the complimentary nature of different approaches and that the approach can be useful if the plan is to conduct thorough needs assessment to inform intervention.

**Participants.** The systematic review of the literature highlighted gaps in the literature, including the lack of self-talk intervention studies utilizing Africa populations in general, and specifically, a Botswana population. The PhD project explored self-talk use among Botswana athletes. Also, self-talk interventions studies primarily utilized novice, non-competitive participants. The current project investigated self-talk use among skilled and

semi-skilled boxing athletes. The athletes also differed in their competition experience, some athletes had regional, continental, and international competition experience while others only had local experience. The current study thus afforded us the opportunity to test a tailored skill-targeted self-talk intervention on athletes with varying experience. Without documented self-talk intervention research targeting boxing and boxing athletes, the present study is a first, adding to self-talk intervention studies on combat sport, and sport in general. This project is significant for Botswana given that it is a first targeting Botswana regardless of sport. The significance of the study is heightened by the promising findings reported.

**Rapport.** The current study prides itself in the researchers' intentionality in building and nurturing rapport with the boxing leadership, boxing community, participating athletes, and coaches. I made time to attend training sessions and competitions long before the project commenced and continued throughout the study project. I did more than attending training sessions and competitions: (1) I availed video recordings to participating athletes and their opponents; (2) accompanied injured athletes to local health facilities when needed during tournaments; (3) provided psychosocial or career counselling to the athletes when needed; (4) facilitated travel and accommodation logistics during tournaments; (5) organised venue and equipment (e.g., projector) for post competition team feedback sessions; (6) volunteered to keep time during training as and when needed; (7) provided hard copies of the weekly training programme in the gym; (8) and designed and provided a hard copy of the daily weight recording sheet. Over and above building and nurturing rapport, I was giving back to the participants and the Botswana Boxing Association. Without the acceptance and trust the participants of the boxing family this project may have suffered severe setbacks. There were challenges but the participants and their coaches made sacrifices to accommodate me in their often very busy and tight schedule.

**Engaging Athletes & Coaches.** One of the known constraints of psychological interventions in sport is that often they are introduced to players and coaches separate from the training process (Blumenstein et al., 2005). The thesis detailed the involvement of athletes and coaches in the process referred to as the needs assessment. One of the strengths of the thesis is thus the engagement of the athletes throughout the process (assessment, implementation, and post intervention reflections), and of the coaches in identifying skills needs, explanations/clarifications of cues and phrases used and reminding boxers to use their self-talk. Because of this involvement, both athletes and coaches were in a position to provide feedback about the project, from the retrospective recall phase to the post-test phase. This speaks to the importance of engagement of recipients and their coaches, it keeps them interested and wanting to use interventions.

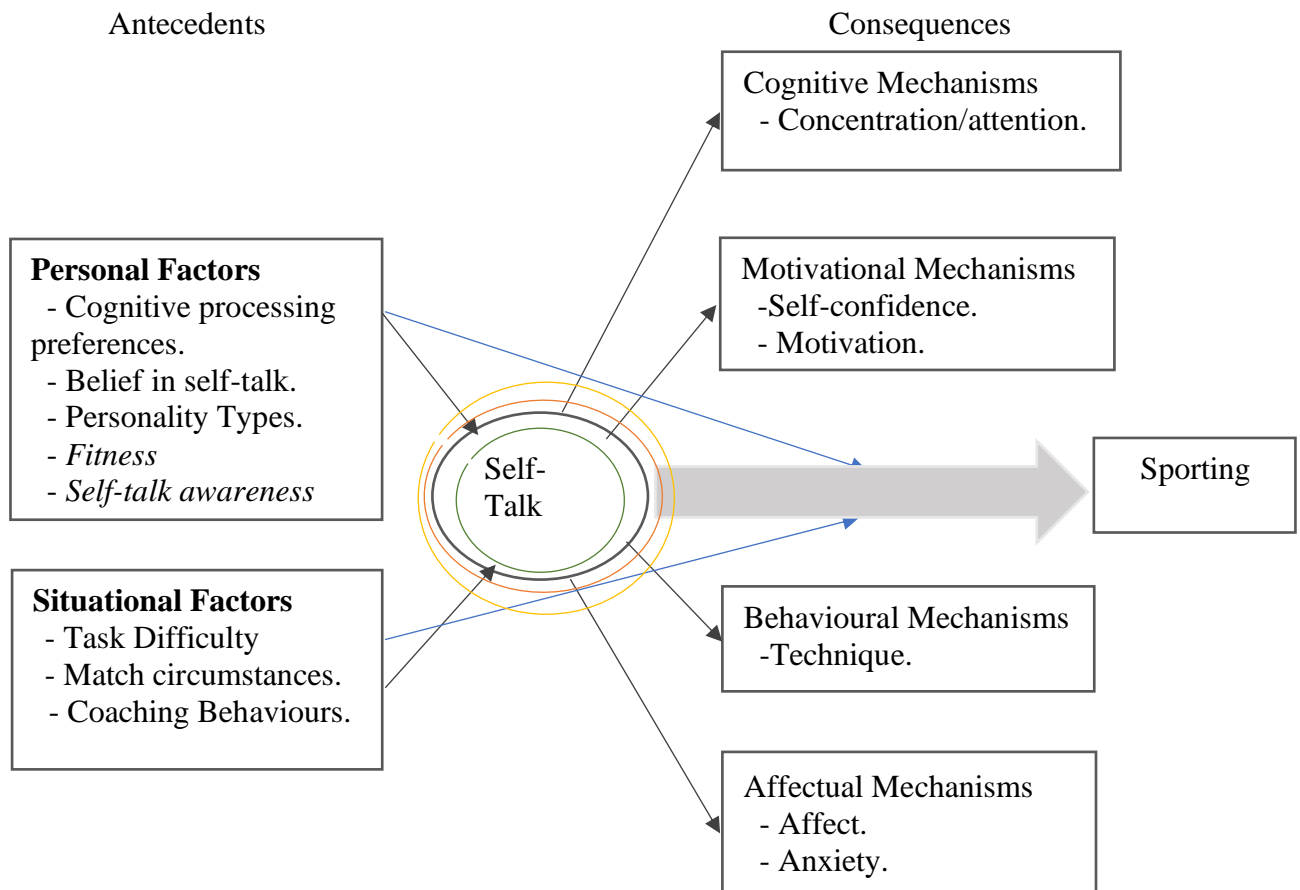
**Self-Talk Framework.** The PhD project in more ways than one added to existing self-talk models, particularly Hardy and colleagues' (2009) Framework, which informed the thesis. Firstly, the study supported the proposition that athletes' self-talk is preceded by distinct personal and situational factors (chapter 4, 6, and 7). Athletes perceived individual factors such as fitness (readiness and injury), and situational factors such as coaching behaviour, match circumstances, and opponents variables to play a role in their self-talk. Secondly, the study expounded on Hardy and associates' (2009) self-talk framework, which suggested possible ways in which coaching behaviour influences athletes' self-talk (chapter 6). Athletes perceived coaches' verbal communication during competition to be influential to their self-talk but what was prominent was the seeming influence on decision making through: (1) availing options when making decisions (e.g., what technique or strategy to use); (2) availing opportunities for independent judgment (if or when to execute coaches' instructions); and (3) challenging athletes' decision making and independent judgment

abilities. In this the thesis hints at a complex dynamic between coaching behaviour influence in action decision making and the role of self-talk. It would seem that coaching behaviour could obstruct task focused self-talk during competition, an area for future research to explore given the significance of coaches in athletes' training and competition performance.

Although the intervention study findings indicated the influence of specific personal and situational variables on athletes' self-talk, the study suggests more. It seemed that personal and situational factors also have direct influence on performance. For example, a knuckle injury limits the use of the affected hand, resulting in less use of said hand. Less use of the injured hand limits the boxer to the use of one hand. This limitation reduces punch frequency and thus punch accuracy opportunities. Similarly, overpowering the opponent early on with heavy punches weakens the opponent physically and mentally, setting the boxer up for a win. Even more, given reported influence of coaching verbal communication (e.g., gives athletes options), when instructions are inaudible a boxer may not know what to do to save a slipping round or to quickly seal a win. On that basis personal and situational factors can influence performance directly. Also, in retrospective recall reports (interviews and manipulation check), real time recordings, and selected self-talk (during planning), self-talk depicted structure and person characteristics, and motivation and instructional functions. The Hardy and associates models would do well to reflect the multi-dimensional if not complex nature of self-talk, which is implied in the Hardy (2006) definition. This is necessary for practitioners to approach interventions with a heightened awareness of self-talk multi-dimensional nature of self-talk It also heightens such awareness to learners of the self-talk concept and strategy. The suggested possible direct influence of personal and situational factors on performance (arrows from antecedents to performance) and inclusion of self-talk complex nature (additional circles) are depicted in Figure 22 below.

**Figure 22**

*Modified Framework for the Study of Self-Talk in Boxing*



**Sport Specific Self-Talk Model:** Van Raalte and associates (2016)'s model

emphasises the interrelated nature of self-talk system 1 and 2 processing, behaviour, personal, and contextual factors. The present study has pointed to personal and situational factors that possibly influenced the athletes self-talk such as fitness, belief in self-talk, coaching behaviours, and competition variables. That said, the present study did not investigate the cognitive aspects (e.g., intuition and reasoning) and did not examine the role of competition circumstances on self-talk content at pre and post-intervention. Had the study investigated self-talk use before and after competition (on match day) and using mixed methods (e.g., video assisted interviews and think aloud) there would be the opportunity to drawing parallels with the model's suggested system 1 and system 2 interconnection with self-talk and behaviour.

**Integrative Perspectives of Self-Talk in Sport.** Worthy of mention is the position of the thesis in the recently proposed integrative perspective of self-talk in sport. The perspective, proposed by Latinjak and associates (2019) proposes that based on existing research, there is organic self-talk and strategic self-talk. Organic is described as statement athletes direct to themselves, which represent ongoing cognitive processes. Organic self-talk is further categorised into two distinct entities – spontaneous self-talk and goal oriented self-talk. The former is considered to be verbalisations that athletes unintentionally direct to themselves, associated to their emotions, beliefs and thoughts. Goal directed self-talk on the other hand is perceived to be self-talk that is rational, which athletes direct to themselves in response to the automatic emotion fuelled self-talk (Latinjak et al., 2019), referred elsewhere as intuitive or system 1 self-talk (Van Raalte et al., 2016). Strategic self-talk on the other hand refers to the intentional use of planned self-talk, used to learn a skill, augment sport performance, or accomplish other associated results (Latinjak et al., 2019). In efforts to

integrate the evidently different terms and descriptions of self-talk used over the years, and since the Hardy (2006) definition, Latinjak and associates' (2019, p. 363) perspective propose that, "self-talk takes form in verbalizations addressed to the self, overtly or covertly, characterized by interpretative elements associated to their content; and it either (a) reflects dynamic interplays between organic, spontaneous and goal-directed cognitive processes or (b) conveys messages to activate responses through the use of predetermined cues developed strategically, to achieve performance-related outcomes."

Distinct studies of the thesis can relate to aspects of the proposed integrative perspective. First, that some participants reported self-talk and indicated that they became aware of their self-talk use during the retrospective interviews (Chapter 4) speaks to the use of organic self-talk. Some of the boxers reported self-talk could be categorised in the distinct organic self-talk categories, spontaneous self-talk (e.g., "why can't I do this?"), and goal-directed self-talk (e.g. "keep trying, you can do it.". Again other reported self-talk would fit the strategic self-talk description, (e.g., "to the body"). The TA study (Chapter 5) may be reflective of strategic self-talk since captured self-talk was mainly instructional, focusing on technique.

**Needs Assessment.** I consider this PhD project to have been an intervention preceded by needs assessment phases (chapters four to six). Taking a leaf from clinical settings where thorough needs assessment precedes intervention, I approached this project with intent to thoroughly assess participants' self-talk awareness, beliefs, uses, needs, and factors at play in their self-talk use. Moreover, intention was to identify participants' boxing skills needs. Needs assessment is essential because it informs intervention and therefore ought to be thorough to ensure that the most suiting treatment is administered. Chapter four to six therefore presented needs assessment findings. Needs assessment was conducted in training,

competition, and away from boxing settings (e.g., interviews). The first needs assessment phase, the self-talk awareness, beliefs, and uses study, introduced participating athletes to the self-talk concept. At this phase, where athletes were not already aware of their self-talk use, the interviews roused awareness, athletes reported so.

In documented self-talk intervention studies, research is silent on athletes' self-talk awareness status. Studies do not document athletes' self-talk awareness status prior to participation thus we do not know whether self-talk awareness plays a role in the self-talk strategy's impact on performance. The current study findings have shown that athletes can use self-talk unawares and that before planning and implementing self-talk interventions, conversations with athletes about their self-talk use interventions have potential to improve awareness and perhaps intentional use of self-talk. Seeing that athletes reported self-talk benefits to their confidence, focus, motivation, and their performance among others, heightened and intentional use of the strategy can yield greater benefits. The present study thus adds self-talk awareness to Hardy and colleagues (2009) personal factors.

Having reported self-talk use, the second phase entailed recording athletes' actual self-talk during some critical aspects of their training, the punch bag and shadow boxing sessions. The use of the think aloud method to assess self-talk use captured athletes' self-talk in real-time. This method of the needs assessment possibly heightened the athletes' self-talk use, encouraged their self-talk use, and augmented self-talk use awareness. Having learnt of the boxers' self-talk awareness, beliefs, awareness, uses, and actual use, the next self-talk needs assessment phase comprised following up on the athletes' perceived coaching behaviour influences. Aided by video and audio recordings the final self-talk needs assessment phase entailed the use of interviews to explore the athletes' perceived coaching



behaviour influences. Parallel to self-talk needs assessment, I engaged the coaches in identifying athletes' skills that could benefit from the intervention. Identifying skills needs necessitated several informal discussions with the coaches and attending competition team feedback sessions. Ultimately an understanding of skills needs was reached, being that athletes needed to improve both offence and defense skills. Precisely, the coaches deemed punch accuracy and the use of guards to be a weakness across participating boxers.

After establishing baseline scores of skills which coaches believed needed intervention, athletes were involved in finalizing their skills needs. Thereafter, athletes selected self-talk cues and phrases they will use to improve their punch accuracy and guard use. Self-talk cues agreed upon were derived from the athletes' self-reported and actual self-talk, and coaches' instructions during competition. I guided athletes to make their selected self-talk more specific to targeted skill. Participating athletes thereafter practiced their self-talk during training and used some of the intervention self-talk and other cues and phrases during post-tests (manipulation check). The coaches were aware that athletes had selected their intervention self-talk, would be practicing said cues ahead of the National Championship and/or Botswana Games, and will use their chosen self-talk during competition and sparring. The entire process (needs assessment and intervention) was introduced to the athletes and coaches from the initial phase and were a part of the process until the end. In this, unlike prevailing documented self-talk intervention studies, participating athletes and their coaches were introduced to the processes linked to both training and competition.

**Intervention Settings.** Predominantly, self-talk intervention studies have shown that self-talk intervention benefits performance in randomized controlled trials (efficacy).

Unquestionable evidence for the self-talk strategy effectiveness is yet to be established. The current study examined self-talk's usefulness in real world settings (training and competition), yielding evidence for the self-talk intervention effectiveness. This finding adds to existing literature and given the extent to which the study was conducted in the real world, the study is important to the self-talk literature.

### **8.3.2 *Summarized Sequence of Processes***

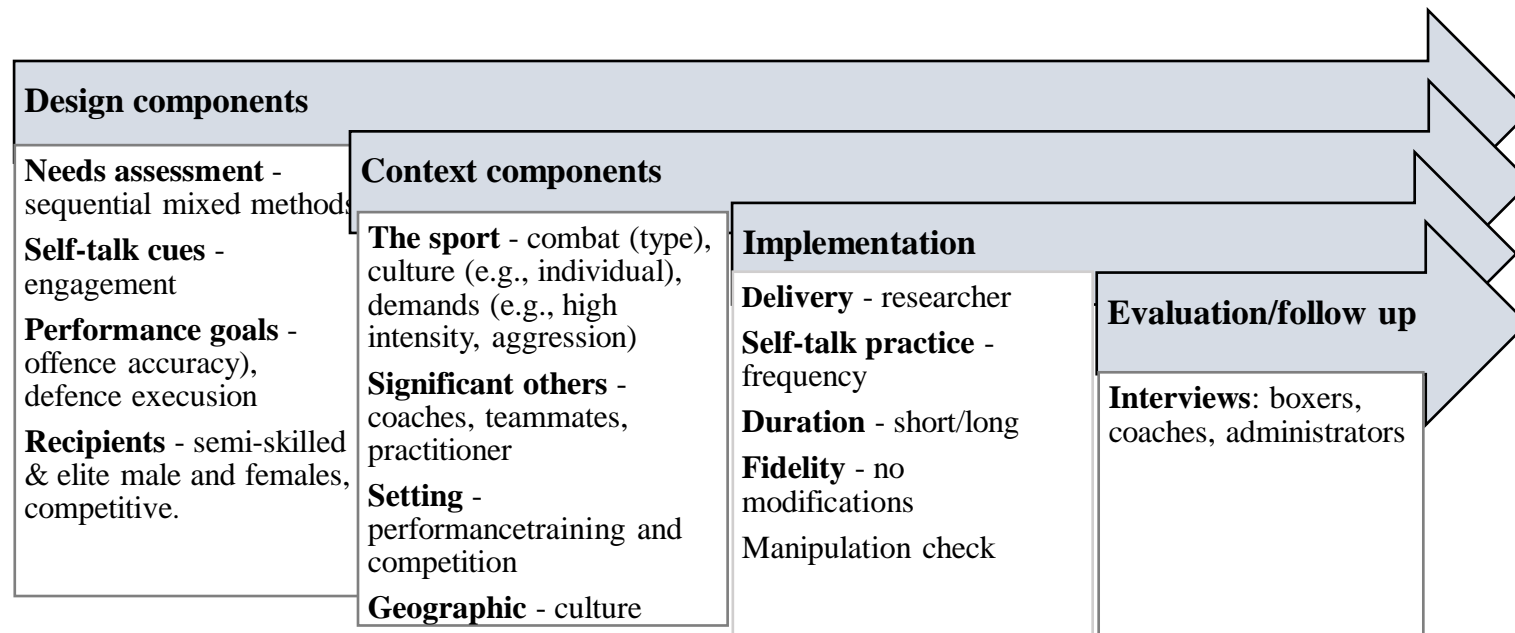
The complexity of planning and delivering a tailored, skills targeted intervention is noteworthy. Self-talk interventions need to be preceded by a planned self-talk needs assessment. The process presents an opportunity for recipients and the practitioner(s) to build rapport – the practitioner will understand strengths and needs of the athlete beyond self-talk use to moderators of said self-talk (personal and situational, and awareness of skills needing intervention, leading to a more tailored intervention. The process gives the recipient time to question and understand the support offered, the role of the practitioner, and learn to be comfortably engage in the process, ensuring true real world conditions. Further, the needs assessment will be more insightful if the practitioner engages the coaches because besides providing insights on the athletes' skills needs, coaches can provide opportunities for close up observations. The process builds trust, allows stakeholders to own the process, heightening adherence. The needs assessment process needs to be is facilitated by various approaches used sequentially or concurrently. In the current thesis the methods were used sequentially. Methods used can be pre-planned with allowance for flexibility guided by what unfolds on the ground, allowing for thorough intervention planning and enhancing fidelity at implementation level. Also, the sport setting and time availability will also guide methods used. Practitioners can use traditional retrospective recall approaches, video assisted

interviews, in action or video observations, think aloud, and observation methods. The thesis found the benefits of employing an assortment of methods to provide a comprehensive picture of individual athletes' needs. Planning and delivering an intervention where the practitioner has a satisfactory understanding of the needs of the recipient potentially increases the chance of intervention effectiveness.

Engaging recipients to validate information compiled about them (e.g., their self-talk, their baseline) before discussing skills allows individuals to appreciate their strengths and needs. Consequently, the athletes may comfortably suggest areas they need help improving. The information can be corroborated with the coach's diagnosis of the athlete's performance needs, leading to a consensus on areas to improve. The current project showed that recipients who are engaged in processes are likely to notice deficiencies in their self-talk and refined their self-talk cues (e.g., from 'jab –jab' to 'jab to score') to be more specific. In this athletes learn to modify self-talk as per need - personal (e.g., sustaining an injury) and situational (e.g., playing an experienced opponent) factors even during competition. Athletes also become confident in their self-talk and use thereof – heightened awareness and heightened self-talk use yield more self-talk use practice. Further, athletes are able to give feedback on the process and point to its value regardless of competition results. Figure 23 below illustrates the sequence and alternate nature in design, context, implementation, and feedback components in the thesis.

**Figure 23**

*Summarized Sequence of Processes*



## **Sport Psychology Research & Practice Opportunity**

Botswana has representation in various sporting events regionally, continentally, and globally (e.g., All Africa Games, The Commonwealth Games, and the Olympics). The country's boxing federation has consistently had a strong representation regionally and continentally. Although Botswana boxers consistently participate at international competitions (e.g., World Boxing Championship, The Commonwealth Games, and the Olympics), the representation is usually not strong with a few boxers qualifying for such games, then losing to their counterparts early in the competition. Botswana boxers like their counterparts in other sports locally, have by far played sport without ever having access to psychological interventions to heighten their performance. Not surprising because to date, the country has two sports psychologists, and the two are not practicing. My ambition is to become the third sport psychologist, and to be a practitioner-researcher. There is gap in both practice and research, as such abundant opportunities.

This PhD project gave participating boxers the opportunity to taste a mental skills intervention. The athletes and their coaches were introduced to the mental skill of self-talk, and in particular, the boxers experienced all phases of the intervention; needs assessment, skills assessment, intervention planning, and the implementation. During the Championship non-participating coaches commented about the difference they observed in how "certain" boxers played remarkably well. "Certain" boxers spoken of were the study participants. The boxing family were in awe at how "certain" boxers though with no medals in their profiles caused upsets to defending champions and won the tittles. When participants were given the opportunity to reflect on the research and give feedback, they reported learning about self-talk, becoming aware of their self-talk, improving their self-talk use and performance, and

improvements in communication with their coaches. Coaches also reported noticeable improvements in athletes' performance and confidence, and in communication between coaches and athletes.

A call to be part of Team Botswana selected for the XX1 Commonwealth Games, Australia 2018 afforded me the opportunity to try and implement the self-talk intervention beyond boxing athletes. The Games were scheduled for April, which was early in the athletes' usual season. Athletes were thus worried about having enough time to prepare. Some athletes had just returned from injury and were still undergoing rehabilitation. These athletes had not competed for a while and so were hesitant to participate. Consequently, issues of injuries, rehabilitation, Games timing, and return to competition informed self-talk intervention approach for many athletes. For other athletes focus was on skill refinement. Team Botswana did exceptionally better than they ever did. For the first time my nation took home five medals, including three gold medals. Moreover, for the first time in the history of the Commonwealth Games a nation won gold in both the men's and women's 400m. It was quite an experience. It affirmed to me that my approach to self-talk intervention can bring results in the real world.

#### **8.4 Study Limitations**

Although the thesis have achieved its aims and objectives, it is worth noting that the thesis had limitations. First, the retrospective interview, TA, and coaching behaviour studies did not investigate self-talk use in all boxing activities (e.g., pad work). Given the uniqueness of pad work since a boxer has a prolonged one on one interaction with the coach, investigating self-talk during pad work could give insights on self-talk use when a boxer has to respond to quick continuous stimuli under and added pressure of having the coach focused

solely on them. Pad work therefore is different from shadow boxing and punch back. Second, the study cannot argue for a fact that the TA method is feasible in boxing settings because there was no performance measure. Third, although the TA provided useful insights for the intervention, it is not known the extent of external factors during the recording (e.g., natural thought flow or triggered). Fourth, although the TA approach afforded the opportunity to capture the boxer's self-talk during non-contact training activities, it remains unknown how similar or dissimilar self-talk content captured during contact activities (e.g., sparring and competition) would be. Fifth, the present study did not capture athletes' level 1 self-talk given that such self-talk is non-verbal in nature. The study is therefore limited in comparing to existing TA studies, which investigated level 1 verbalisations.

Sixth, although athletes deemed the entire research process beneficial, its meaningfulness cannot be extended to other boxers or athletes. Seventh, the exploration of coaching behaviour influences focused on interaction during competition, a setting where interaction between the boxer and coach is limited. Investigating coaching behaviour influences during training settings (e.g., pad work) may have yielded more insights. Eighth, conducting sparring post-tests before the last competition event of the season (National Championship) may have yielded different results because the sparring would have been about preparation than for simply end of season training. Ninth, the needs assessment processes (Chapters 4 to Chapter 6) was time consuming and may not be practical in settings when there are time constraints limited. Lengthy processes require longer commitment from recipients, increasing rates of participation drop out be it because of time constraints, injuries or other challenges. Tenth, the study explored few mixed methods, the use of video analysis for skill execution or electromyogram may enhance the needs analysis process, and thoroughness thereof.

## 8.5 Future Research

Study findings, strengths, and processes discussed make a case for further research. Confidence in the current study methodology, processes, and gains can only be reinforced through further investigations. First, future systematic review ought to use the more recent PRISMA flowchart (e.g., Page et al., 2021) to ensure that the literature identification process is transparent, boosting confidence in the findings because and aligning to current systematic review practice. Second, the feasibility of the TA method in capturing real time self-talk in boxing non-contact settings needs to be further investigated. Precisely, research needs to capture real time self-talk in different training conditions such as off season training, preparations for major tournaments, and during training camp when teammates and coaches are different from ones at the club. Examining real time self-talk across different training conditions may give added insights on whether self-talk content and characteristics vary depending on training conditions. Moreover, future research needs to examine self-talk use during pad work, a setting where an athlete has prolonged one on one engagement with a coach and responds to quick, continuous stimuli. Investigating self-talk use in different training settings and conditions would give insights on said factors' influence on the type of self-talk used, and may point out self-talk content differences depending on skill level. For instance, learners may use self-talk loaded with information compared to skilled workers.

Third, research on the impact of coaching behaviour is still limited. Based on limitations of the present study, future research examining the influence of coaching behaviour on athletes' self-talk needs to factor in high and low pressure training contexts (e.g., off season training, championship preparation training, and national team camp). High and low pressure training contexts place different expectations and demands on both athletes



and coaches, possibly influencing coaching behaviours and athletes' responses. Further, to better understand coaching behaviour influences on athletes' self-talk and in different settings necessitates experimental studies to establish causation, understand the impact on performance, and the degree of effect. Fourth, research needs to examine the proposed direct impact of personal and situational antecedents on performance, adding insights to theory, Hardy and colleagues (2009) self-talk framework. Fifth, the mixed methods approach's observed potential to yield a thorough needs assessment, informing tailored, skill-targeted self-talk interventions, needs further investigation. For instance, further research may help identify ways that the needs assessment process may be thorough without being time consuming. Also, future research may consider additional needs assessment methods (e.g., questionnaires and observations) that may augment the needs assessment process, without lengthening the process.

Sixth, there is need for more tailored skill-targeted self-talk intervention studies in real world settings to solidify confidence in the effectiveness thereof in boxing (current study) and tennis (e.g., Hatzigeorgiadis et al., 2014) or other sport. Research would do well to examine effectiveness differences (e.g., effect size) between short (e.g., current study) and long interventions (e.g., Hatzigeorgiadis et al., 2014). Further future tailored self-talk interventions ought to simultaneously examine the effectiveness thereof on individual skills (e.g., offense, defense, and tactic) and overall performance (e.g., bout results), providing insights on how self-talk interventions may be used to concurrently improve all skills and attributes needed for optimum performance. To have added insights on intervention complexities (what works better, on whom it works best on, where it works best, and who is best suited to administer the intervention) more real world tailored self-talk interventions are necessary, targeting different sports, using short and long duration interventions, targeting

athletes of different skill and experience levels, and in varying training and competition environments, there will be (complexity issues). Seventh, future research needs to investigate factors that explain the effectiveness of tailored self-talk interventions among boxers and other athletes. The boxers reported using self-talk because it helps their motivation and focus (Chapter 4). The intervention study did not investigate mediating factors, it is necessary for future research to assess mediating mechanisms during intervention, in real life training and competition. Questions below summarise future research directions:

1. How similar or different is real time self-talk captured under different training conditions or contexts?
2. Do perceived coaching behaviour influences vary depending on setting and purposes or goals?
3. In what ways could self-talk antecedents be having a direct impact on performance?
4. What additional methods may enhance the needs assessment process?
5. Are there differences between short and long tailored skill-targeted self-talk interventions in boxing or other sport?
6. How effective is a tailored self-talk intervention in improving overall sport performance?
7. What intervention design, context, and implementation complexities exist in self-talk interventions?
8. What mechanisms drive the effectiveness of tailored self-talk interventions?

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## APPENDICES

### *Appendix A Eight “Big-Tent” Criteria for Excellent Qualitative Research*

Criteria for quality (end goal)	Quality demonstration
Worthy topic	The Topic: a) is relevant to current self-talk research,  b) timely and important given the lack of self-talk research on boxing and Botswana athletes, c) is interesting, presenting the opportunity to understand ways in which boxers use self-talk based on retrospective reports, and d) spearheads self-talk research in Botswana.
Rich rigor	The study: a) context and sample fit the study purpose, b) sufficient data collected across contexts to answer research questions, and c) followed and documented appropriate interview method, and the transcription and analysis processes.
Sincerity	The study: a) research methods and challenges were openly discussed with the supervisory team, b) acknowledged the involvement of research assistants in the transcribing stage, c) acknowledged the involvement of participants during the analysis phase.
Credibility	Credibility reflected in: a) dialogue with participants and boxing experts to clarify and ascertain understanding of meanings ascribed to specific words, phrases and sentences, and b)

findings are framed after existing self-talk literature (e.g. Hardy et al., 2001).

Resonance	I hope the findings raise interest on self-talk use among boxing athletes in general, and Batswana boxers and athletes specifically.
Significant contribution	The study provides an important contribution in the self-talk study conceptually, methodologically and practically.
Ethical	The research process entailed: a) obtaining ethical clearance from relevant government authorities, formal permission from gatekeepers, and written and verbal consent from participants, b) emphasising participants' right to withdraw, and c) ensuring anonymity by using pseudonyms.
Meaningful coherence	The study achieves stipulated goals, and employed methods and procedures fitting to the study goals.

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**Appendix B** *Self-Talk Use Setting and Degree of Use*

<b>General Context</b>	<b>Specific Setting</b>	<b>Degree of Use *</b>
Training	Pre-training/Warm up	78
	Shadow boxing	92
	Punch Bag	65
	Sparring	69
	General/Unspecified training	49
Competition	Bout	200
Total		553

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\* cue words, phrases, sentences, and questions

### Appendix C Reported Self-Talk Content in Context

General Context	Specific Context	Type of Self-Talk					Total Units
		Functions		Valence			
		MST	IST	Positive	Negative	Neutral	
Training							
	Pre-training/Warm up	17	1	17	19	9	63
	General/Unspecified	13	-	9	34	2	58
	Shadow Boxing	42	100	4	5	4	155
	Punch Bag	45	55	6	44	11	161
	Sparring	25	18	13	7	4	67
Competition							
	Pre-bout/Bout	33	20	32	40	16	141
Units Totals		175	194	81	149	46	645

## Appendix D *Self-Talk Structure in Context*

Context	Structure				Total
	Cue	Phrases	Sentences	Questions	
	Words				
Pre & Warm up	5	16	52	15	88 (100%)
Shadow Boxing	25	41	29	7	105 (100%)
Punch Bag	6	42	26	6	75 (100%)
Sparring	16	22	47	9	94 (100%)
General training	6	22	34	7	69 (100%)
Competition	13	67	115	20	215 (100%)
Total	71	210	303	61	645 (100%)

## Appendix E *Self-talk Use Influences*

Main Themes	Sub Themes	Number of Units
Personal	Fitness	3
	Emotions NM,	21
	Tiredness	18
	Other emotions	29
Situational	Belief in self-talk	7
	Significant other	13
	Teammates	36
	Coaches	6
	Competition	4
	Opponent	
	Bout Progress	
	Environment	

\*Personal = 71, Emotions = 39, Situational = 66, Significant other = 20, Competition = 46

**Appendix F** *Reported Self-talk Uses*

Overall Uses	Specific Uses		Units	Athletes
Motivation	Endurance		6	5
	General		6	4
	Confidence		2	2
	Morale		24	10
	Assurance		6	4
Performance	Tactic	Work rate	7	5
		Plan	10	8
	Technique	Learning	2	2
		Correcting	6	5
		Reminder	6	3
Control	Concentration		10	5
	Emotions		3	2
Helpful - General			6	4

\* Motivation = 44 Units, Performance = 31 Units, Control = 13, and General = 6



## **Appendix G** *Recorded Self-Talk Sample*

Setting	Self-Talk
Shadow	Jab, jab, jab-jab, 1-2-3, jab, 1-2, jab, lead with a 2, move, move, turn to the right, jab, jab, jab, 2, 1-2-3, jab, 1-2-5, jab, move, move, jab, jab, 1-2-3, jab, 2, 2-5, jab, step back, step in, 2, jab, move to the right, jab, 2, jab, lead with a 2,
Boxing	lead with 2, 1-2, jab, jab-jab, 2, 2-5, jab, 2-5-2, step in 2, 3-5, swing your upper body, 2, 1-2, 5, 5, guards up, move, swing with upper body, left – right, jab, jab, 1-2, 2, jab-jab, 2, 1-2-5, jab, jab, swing, swing, 2, 2-3...[Botshelo]
	Jab, Jab jab – 2, Keep jabbing, Keep jabbing, Keeping Jabbing, Jab jab 2, Move, Move. Guard up, guards up, Jab jab 2, Move, move, Move forward, forward, forward, let's go, Don't forget to jab, Keep jabbing, Jab, Move your head and counter, Move your head and counter, Keep jabbing, go in, in fight, fight in...[Kagiso]
	Swing your upper body, jab, 1-2, go out with a jab, go in with a jab, throw a 2, 1-2-3, 1-2, 5, 2, 3, move, move around, move, move, swing, jab, move, move around, 1-2, jab, 3-2, go, jab, jab, 1-2, move, move, lead with a jab, 2, 1-2, move, move, jab, start striking with a jab, jab, jab, 2, 1-2, 5, move, 3, go, swing, swing, out, in, 1-2, 3, jab-jab, 2, 5, 3, 2, make a lead with a 2, 1-2, 5, move, swing, 1-2-3, move, swing, jab-jab, 2, 5, move to the left, move to the right, 2, 2, jab, 3, 1-2-5, 3, go, guards up, round up, move around, relax, relax, shake your legs, shake your legs, relax, relax, relax...[Larona]
	1 – 2, 1, 2, 1, 1 – 2, 1, 5 – 4, 1 – 2, 1 – 2, 5 – 2, 1 – 2, 1 – 8, 1 – 2, 1 – 2 – 2, follow, 1 – 2, 5 – 2, 1, 1, 2, follow, 1 – 2, 1 – 2, 1 – 2, 2, 1, step forward, back, 2, 1, 2, 1 – 2, 1 – 2, 2 – 1, 4, 1, 1 – 2, 2, 2 – 2, 1 – 2, follow, 1 – 2, 1 – 2, 5 – 2,

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1 – 2, 1 – 2, 2, 1 – 2, 1 – 2, 3, 4 -5, 3 – 4, 1 -2, follow, 1 -2, 1 - 2, 1, 1, 5 – 2, 1 – 8, 1 – 2, 4, 1 -2, 1 – 2, follow, move, 1, 1, 2, 3 -4, 1 -2, 3 -4, 1, 1 -2, follow, 1 -2, 1 – 2, 1, 1, 2, 2, 1 – 2, 1 – 2, 2, move, 1, 7 -8, move, jab, jab, 2, 1 -2, 1 – 2, 1, 5 – 2, 1 – 2, 1 -2, 5 – 2, jab, jab – 2, 1, move, move, intensity...[Malaki]

With the right guard, come with the right guard, move, 1 – 2, jab, jab, follow, follow with a jab, step 2 – 5, jab, jab, jab, 3 - 2 – 5, slip, 3 – 2 – 5, move your head, 3 – 2 – 5, move your head, 1 – 2, jab, move your head, move your head, 3 – 2, 3 – 2 – 5 – 6, 2, 1 – 2 – 5, turn, 1 – 2 – 5 and turn, 3 – 2, surprise 3, jab, jab, surprise 3, 2 – 5, jab, guards up, guards up, 2 – 5, move the head, 5 - 2 – 5, 5 – 2, slip, 5 – 2, jab, jab, jab, 3 – 5, 5 – 2, jab, jab, 2 – 5 – 2, 2, guards up boy, guards up boy, always jab, always jab, 1 – 2, guard, guard, jab...[Carlson]

Punch, jab, keep him away, jab, control the pace, move, jab, 1 - 2, again, body punches, move away, turnings, surprise 2, jab, jab, drive him to the ropes, punch him, step back, inside, jab, surprise 2, jab, uppercut, body, drive him to the ropes, now punish him, combine, jab, surprise 2, follow, again, body punches...[Mokwena]

Punch Bag go, target yah, control, control, keep your guards, yah 1,2, yah rotate, go over the rotation, jab, pick up the target then you hit hard, keep on throwing something, up, up the game, put on a step, keep on jabbing, control, spare it, keep rotating, up the pace, have to move, yaah keep jabbing, your guards are down, guards up, stand, guards up all the time, ready!! Box, power punches, movement, attention, yah come forward, up, guards, yah power punches, yah control...[Aone]

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Punch hard, again, uppercut, follow up the punches, combination, work, 1-2-4, 1-3-5, uppercuts, speed, uppercut, speed, speed, jab, jab 2, jab 1-2, guards, punch and move, guards, guards and punch, punch, catch and move, 1-2-5, work, guards up, jab, move right, work, punch, uppercut, step in, speed, punch, guards, tight guards, work, upper body, work, forward, strong, turn, work, work on your speed, you need to work, don't stop keep the jab going, jab, 1-2, 1-2...[Bangu]

Jab, 1 – 2, Jab, 1- 2, 1 – 2, uppercut, uppercut, 1-2, Jab jab, 1 – 2, Follow your game plan, Jab - 2, Jab - 2, Jab -2, Follow the game plan. 1 – 2, Use the perfect uppercut, The perfect uppercut. 1 – 2, 1 – 2, 1 – 2...[Changu]

Speed, speed, speed movement, speed, speed and movement, speed movement, stretch, guards, tight guards, body, speed, speed, faster, faster, speed, slip a jab, tight guards, snap a jab, body, move, guards, guards, speed with the guards, punch the body, quick 1 – 2, 2 – 5, 2 – 5, to the body, again, again, finish up, breath, speed, power quick shots, more power, 3 – 1 – up, power, 1 – 2 – 5, power, 2 – 5 – 2, speed, 2 – 5 – 2, 3 – 4, body, guards, body, inside, outside, straight to...[Noel]

Jab, left, straight, up, straight, 2 – 1 – 2, 1 – 2, 1 – 2, 1 – 2, 1, jab, 1 – 2, 1 – 2, 2 – 1, 2, 2 – 5, 1 – 8 – 5, 1 – 8, 1 – 8, 1 – 8, 2 – 5, 5, 3 – 2 – 5, jab, jab, 4 – 5, jab, 1 – 4 – 5, 3 – 2, 5 – 2, jab, stay out, stay out, 5 – 2, more jab – more jab, more jab, stay out, jab one more time, keep moving, slip 2, jab, slip 2, jab, stay out – stay out, invite him, jab, there he comes, 2 – 5, jab, jab, 3 – 2 – 5 long, stay out, 3 – 2 – 5, 3 – 2, jab – jab, jab, jab, 3 – 2, jab, jab, 3 – 2, jab, move move, jab, move with a jab, 3 – 2 – 5, speed...

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**Appendix H** *List of Self-Talk Cue Words and Phrases Discussed*

<b>Instructional</b>	<b>Motivational</b>
Forward*	Finish hard*
In and out*	10 seconds*
Move to the side*	Work him
To the body	Destroy this guy
Same time	Round up
More punches	Work rate
Speed	You are a beast
Control the pace	let's go*
Work Rate	work*
Find the space	See the opponent
Power	
Man first*	
Counter*	
Follow	
Move your head	
Attack, attack	

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Note. Phrases, which overlapped between categories or sub-categories.

## **Appendix I** *Eight “Big-Tent” Criteria for Excellent Qualitative Research*

<b>Criteria for quality</b>	<b>Quality demonstration</b>
<b>(end goal)</b>	
Worthy topic	The Topic: a) is relevant to current self-talk research, b) timely and important given the lack of self-talk research on boxing and Batswana athletes, c) is interesting, presenting the opportunity to understand actual ways in which boxers use self-talk, and d) adds to limited research which compares real-time and reported self-talk.
Rich rigor	The study: a) context and sample fit the study purpose, b) sufficient data collected across contexts to answer research questions, and c) followed and documented appropriate TA method, and the transcription and data analysis processes.
Sincerity	The study: a) research methods and challenges were openly discussed with the supervisory team, b) acknowledged the involvement of research assistants in the transcribing stage, c) acknowledged the involvement of coaches and participants during TA practise recordings, and of participants and boxing experts during the analysis phase.
Credibility	Credibility reflected in: a) compared current findings to the preceding interview study findings, which revealed similarities in ways boxers use self-talk, and b) dialogue with participants

and boxing experts to clarify and ascertain understanding of meanings ascribed to specific words, phrases and sentences.

**Resonance** I hope the findings raise curiosity regarding self-talk use among Batswana boxers and inspire self-talk use in contexts other than boxing.

**Significant contribution** The study provides an important contribution in the self-talk study The study has meaning and significance: a) theory - the framework for the study of self-talk in sport, b) self-talk use research in general, c) methodology – suggests the feasibility of TA in boxing, d) practical – encourages the use of self-talk and heightens awareness of self-talk use.

**Ethical** The research process entailed: a) obtaining ethical clearance from relevant government authorities, formal permission from gatekeepers, and written and verbal consent from participants, b) emphasising participants’ right to withdraw, and c) ensuring anonymity by using pseudonyms.

**Meaningful coherence** The study achieves stipulated goals, and employed methods and procedures fitting to the study goals.

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**Appendix J** *Eight “Big-Tent” Criteria for Excellent Qualitative Research*

<b>Instructional</b>	<b>Motivational</b>
Forward*	Finish hard*
In and out*	10 seconds*
Move to the side*	Work him
To the body	Destroy this guy
Same time	Round up
More punches	Work rate
Speed	You are a beast
Control the pace	let's go*
Work Rate	work*
Find the space	See the opponent
Power	
Man first*	
Counter*	
Follow	
Move your head	
Attack, attack	

Note. Phrases, which overlapped between categories or sub-categories.

# Appendix K TA Self-Talk Types in Context

Self-Talk	Motivational Units	Instructional Units	Units Total
Context			
Shadow	20 (2.00%, 19.80%)	978 (98%, 50.33%)	998 (100%, 48.83%)
Boxing			
Punch Bag	81 (7.74%,80.20%,)	965 (92.26, 49.67%)	1046 (100%, 51.17%)
Units Total	101 (4.94, 100%)	1943 (95.06%, 100%)	2044 (100%)

Note. Percentages are given as (row, column).



**Appendix L** *TA Self-Talk Functions Sub-Categories*

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**Self-Talk Functions (2044 units) Sub-Categories**

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Instructional - 1943 (95.06%)

Motivational - 101 (4.94%)

Technique 1477 (72.26%)

Effort 27 (1.32%)

Tactic 486 (23.78%)

Morale 42 (2.06%)

Kinaesthetic 49 (2.40%)

Nerve 10 (.49%)

Endurance 6 (.29%)

Feedback 22 (1.08%)

Relax 8 (.39%)

Alert 3 (.15)

Combine Sub-categories 2012 (98.43%)

Combined Sub-categories 118 (5.78%)

Note 1. Percentages units given as (row, column), 2. Due to overlaps in some sub-categories, sub-categories total units (2130) exceeds main categories (instructional and motivational) total units (2044).

## Appendix M TA Technique Sub-Categories

Context	Offence Technique	Defence Technique	Total Units
	Units	Units	
Shadow	763 (91.38%, 55.17%)	72 (8.62%, 59.02%)	835 (100%, 55.48%)
Boxing			
Punch bag	620 (92.54%, 44.83%)	50 (7.46%, 40.98%)	670 (100%, 44.52%)
Total	1383 (91.89%, 100%)	122 (8.11%, 100%)	1505 (100%)

Note 1. Percentages units given as (row, column), 2. Due to overlaps in some sub-categories, the total sub-categories units (1505) exceeds the original (1477) technique units.

**Appendix N** *TA Self-Talk Characteristics*

Self-Talk Characteristics (2044)			
Structure (2044)		Person (2044)	
Cue word	1022 (50%)	First Person	11 (.54%)
Phrase	1017 (49.76%)	Second Person	98 (4.79%)
Sentence	5 (.24%)	Imperative	1935 (94.68%)

**Appendix O** *Real-time and Interview Self-Talk Themes Comparison*

Method	Self-Talk Type	Self-Talk Characteristics	
		Structure	Person
TA	Motivational	Cue words	First
	Instructional	Phrases	Second
		Sentences	Imperative
Interview	Motivational	Cue words	First
	Instructional	Phrases	Second
	Positive	Sentences	Imperative
	Negative	Questions	Unclear
	Neutral		

**Appendix N** *TA and Interviews Self-Talk Functions Prevalence Comparison*

Context	Method	Instructional	Motivational	Total
Shadow boxing	TA	978 (98%)	20 (2%)	998 (100%)
	Interviews	70 (76.09%)	22 (23.91%)	92 (100%)
Punch bag	TA	965 (92.26%)	81 (7.74%)	1046 (100%)
	Interviews	33 (50.77%)	32 (49.23%)	65 (100%)

Note 1. Percentages units given as (row, column), 2. There were 2044 self-talk units recorded in the TA to 127 self-talk units reported during interviews, in shadow boxing and punch bag.

**Appendix P** *TA and Interviews Self-Talk Characteristics Prevalence Comparison*

Characteristics	Method				Total
	TA		Interviews		
Structure	Cue word	1022 (97.99%)	Cue word	21 (2.01%)	1043 (100%)
	Phrase	1017 (93.05%)	Phrase	76 (6.95)	1093 (100%)
	Sentence	5 (9.09%)	Sentence	50 (90.91%)	55 (100%)
			Question	10 (100%)	10 (100%)
Person	First	11 (20.37%)	First	43 (79.63)	54 (100%)
	Second	98 (73.13%)	Second	36 (26.87%)	134 (100%)
	Imperative	1935 (96.13%)	Imperative	78 (3.87%)	2013 (100%)

Note 1. Percentages units given as (row, column), 2. Total TA and interview structure or person units is 2310, this is not captured in percentages.



## **Appendix Q** *Self-Talk Awareness, Beliefs, and Usage Documents*



### **PARTICIPANT INFORMATION**

**Phd Project Title:** Investigating Self-talk Awareness, Beliefs, Usage and Influences: Implications for Effective and Skill-Targeted Self-Talk Interventions

**Study 1:** Self-Talk Awareness, Beliefs and Usage

**Name of Researcher:** Kagiso N. Tlhabano

**School of Sport & Exercise Science**

You are invited to take part in a research study. Before you decide to take part or not to, it is important that you understand why the research is being done and what it involves. Please take time to read the following information. Ask us questions if there is anything that is not clear or if you would like more information. Take time to decide if you want to take part or not.

#### **1. What is the purpose of the study?**

Research has shown that what athletes say to themselves (self-talk) during competitions can help them do better or worse. I am doing a study that seeks to help boxers control their thoughts and think in ways that help them do better in competitions. I need to first find out how much you are aware of your thoughts during your boxing training and competitions. I also seek to find out if you use self-talk, if you do, how much you use the self-talk. Finally, since research suggests that the benefits of self-talk cues depend on whether or not individual athletes believe those self-talk cues, this study seeks to find out your beliefs about your stated self-talks.

#### **2. Do I have to take part?**

Taking part in this study is voluntary. It is up to you to decide whether or not to take part. If you decide to take part you will be given this information sheet, have the information and purpose of the study explained to you verbally, and asked to sign a consent form. You are still free to withdraw from the study at any time without giving a reason. A decision to withdraw will not affect your rights/any future treatment/service you receive.

#### **3. Who can take part in the study?**

- Male/female boxing athletes
- Aged between 18 to 26 years of age
- Have at least 12 months boxing experience
- Have inter-club competition experience

#### **4. What will happen to me if I take part?**

- In the first phase of the study you will be interviewed via skype call, and the interview will last between 45 and 90 minutes. The interview will be audio recorded.
- In the second phase of the study you will be given instructions to say out loud your thoughts during the shadow boxing and punch bag sections of one of your training sessions. In other words, you will be asked to think aloud. You will have a voice recorder with a headset hooked onto you to enable audio recording of your thoughts as you think aloud.
- This study will require at the most 2 hours of your time, 30 minutes of which will be during your normal training time.

#### **5. Are there any risks / benefits involved?**

During the course of the study you will not be exposed to any risk beyond what your usual training expose you to. You may however, experience discomforts during the skype interview and the think aloud recording. Although this study will not take much of your time, you may find the interview time inconvenient. In order to reduce the level of inconvenience the skype interviews will be scheduled at a time most convenient for you. The benefits of this study is that it will give us information that will be useful in preparing a self-talk intervention tailored for you.

#### **6. Will my taking part in the study be kept confidential?**

The information you share during the study will be kept confidential throughout the study and when the findings are shared in conferences and/or in publications. Direct quotes of what you shared will be anonymous at all times.

**This study has received ethical approval from the University of Botswana's Research Ethics Committee** (*insert REC reference number and date of approval*)

**Contact Details of Researcher:** [K.N.Tlhabano@2016.ljmu.ac.uk](mailto:K.N.Tlhabano@2016.ljmu.ac.uk) (+ 267 355 2290)

**Contact Details of Academic Supervisor:** D.A.Tod@ljmu.ac.uk (+ 44 15190 46241)

**If you have any concerns regarding your involvement in this research, please discuss these with the researcher in the first instance. If you wish to make a complaint, please contact [mary.kasule@mopipi.ub.bw](mailto:mary.kasule@mopipi.ub.bw) and your communication will be re-directed to an independent person as appropriate.**



### CONSENT FORM - ORIGINAL

**PhD Project Title:** Investigating Self-talk Awareness, Beliefs, Usage and Influences: Implications for Effective and Skill-Targeted Self-Talk Interventions

**Study 1:** Self-Talk Awareness, Beliefs and Usage

**Researcher:** Kagiso N. Tlhabano

**School of Exercise and Sport Science**

1. I confirm that I have read and understand the information provided for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason, and that this will not affect my legal rights.
3. I understand that any personal information collected during the study will be made anonymous and remain confidential.
4. I agree to take part in the above study through skype interview and have my thoughts recorded when I say them out loud (Think Aloud) during training.
5. I understand that the interview and think aloud sessions will be audio / video recorded and I am happy to proceed.
6. I understand that parts of our conversations may be used verbatim in future publications or presentations but that such quotes will be made anonymous.


Name of Participant	Date	Signature
.....	.....	.....
Name of Researcher	Date	Signature
.....	.....	.....
Name of Person taking consent (if different from researcher)	Date	Signature
.....	.....	.....



## INTERVIEW GUIDE

### Study 1: Self-Talk Awareness, Beliefs and Usage

#### Instructions:

1. During the next hour I will ask you to reflect on your boxing training and competition moments. I will ask you questions regarding your thoughts during the different moments of training and competition. I will spend most of the time asking you to reflect on your warm-up, shadow boxing, punch bag and the sparring sessions of training. Towards the end I will ask you to reflect on your bouts (competitions).
2. There are no right or wrong answers to the questions, you simply share your experiences and thoughts as best as you can remember them.
3. Do not feel hurried, take your time to respond.
4. Use any language you prefer between Setswana and English.
5. Be free to seek clarification if at any stage the question is not clear to you.
6. If at any time during this interview you do not want to continue, please let me know and we will discontinue the interview without consequences.

#### Demographics

Let us start with questions about you, please tell me;

1. Your name
2. Your date of birth
3. What year you joined boxing
4. How many competitions you have taken part in in the last 12 months
5. At what level of boxing competitions have you participated (national, zonal, continental, international)?
6. Why you join boxing?
7. Why you continued with boxing

#### Warm-up Session

Please think of the warm-up part of any training session. Do your best to remember what you usually think during warm-up.

1. Do your best to remember what you usually say to yourself at the beginning and during warm-up session. Please share those thoughts.
2. Please share any other thoughts that you usually say to yourself during warm up.
3. Do the thoughts you have just shared reflect what you usually say to yourself during warm-up sessions?  
\*If so, how much (out of 10) do the thoughts you have shared reflect what you usually say to yourself in warm-up sessions?
4. Do you say these thoughts in your head or out loud?  
\* If so, how often (out of 10) do you say them in your head?
5. Are there times when you go through warm up sessions without talking to yourself?  
\* If so, how often (out of 10) does that happen often?
6. You have shared your thoughts during warm up, are you usually aware of those thoughts during warm up?

- \* If so, when are you most aware?
- 7. Please share with me how helpful you find your thoughts to be during the warm up are.
  - \* How helpful are your thoughts (out of 10)?
  - \* Which of the thoughts you have shared are most helpful/unhelpful to you?
- 8. These thoughts that you have shared with me (helpful/unhelpful), do you believe them?
  - \* How much (out of 10) do you believe the thoughts you have shared with me?
- 9. Are these thoughts generally the same throughout the warm up and/or in every warm up? Degree of variance  
If they change ask why

### ***Shadow Boxing***

Please think of the shadow boxing part of any normal training session. Do your best to remember what you usually think during shadow boxing.

1. Do your best to remember what you usually say to yourself at the beginning and during shadow boxing. Please share those thoughts.
2. Please share any other thoughts that you usually say to yourself during shadow boxing.
3. Do the thoughts you have just shared reflect what you usually say to yourself during shadow boxing?
  - \* If so, how much (out of 10) do the thoughts you have shared reflect what you usually say to yourself in warm-up sessions?
4. Do you say these thoughts in your head or out loud?
  - \* If so, how often (out of 10) do you say them in your head?
5. Are there times when you go through shadow boxing without talking to yourself?
  - \* If so, how often (out of 10) does that happen often?
6. You have shared your thoughts during shadow boxing, are you usually aware of those thoughts during shadow boxing?
  - \* If so, when are you most aware?
7. Please share with me how helpful you find your thoughts to be during the shadow boxing are.
  - \* How helpful are your thoughts (out of 10)?
  - \* Which of the thoughts you have shared are most helpful/unhelpful to you?
8. These thoughts that you have shared with me (helpful/unhelpful), do you believe them?
  - \* How much (out of 10) do you believe the thoughts you have shared with me?
9. Are these thoughts generally the same throughout shadow boxing rounds and/or in every shadow boxing session? Degree of variance  
If they change ask why

## **Punch Bag**

Please think of the punching bag part of any normal training session Do your best to remember what you usually think during.

1. Do your best to remember what you usually say to yourself at the beginning and during punch bag session. Please share those thoughts.
2. Please share any other thoughts that you usually say to yourself during the punch bag session.
3. Do the thoughts you have just shared reflect what you usually say to yourself during punch bag sessions?  
\*If so, how much (out of 10) do the thoughts you have shared reflect what you usually say to yourself in punch bag sessions?
4. Do you say these thoughts in your head or out loud?  
\* If so, how often (out of 10) do you say them in your head?
5. Are there times when you go through punch bag sessions without talking to yourself?  
\* If so, how often (out of 10) does that happen often?
6. You have shared your thoughts during punch bag session, are you usually aware of those thoughts during punch bag?  
\* If so, when are you most aware?
7. Please share with me how helpful you find your thoughts to be during the punch bag are.  
\* How helpful are your thoughts (out of 10)?  
\* Which of the thoughts you have shared are most helpful/unhelpful to you?
8. These thoughts that you have shared with me (helpful/unhelpful), do you believe them?  
\* How much (out of 10) do you believe the thoughts you have shared with me?
9. Are these thoughts generally the same throughout the punch bag session and /or in every punch bag session? Degree of variance  
*If they change ask why*

## **Sparring**

Please think of the sparring part of any normal training session Do your best to remember what you usually think during sparring.

1. Do your best to remember what you usually say to yourself at the beginning and during sparring. Please share those thoughts.  
\*Please share any other thoughts that you usually say to yourself during sparring.
2. Please share any other thoughts that you usually say to yourself during the sparring session.

3. Do the thoughts you have just shared reflect what you usually say to yourself during sparring?  
 \*If so, how much (out of 10) do the thoughts you have shared reflect what you usually say to yourself in sparring?
4. Do you say these thoughts in your head or out loud?  
 \* If so, how often (out of 10) do you say them in your head?
5. Are there times when you go through sparring without talking to yourself?  
 \* If so, how often (out of 10) does that happen often?
6. You have shared your thoughts during sparring, are you usually aware of those thoughts during warm up?  
 \* If so, when are you most aware?
7. Please share with me how helpful you find your thoughts to be during the sparring are.  
 \* How helpful are your thoughts (out of 10)?  
 \* Which of the thoughts you have shared are most helpful/unhelpful to you?
8. These thoughts that you have shared with me (helpful/unhelpful), do you believe them?  
 \* How much (out of 10) do you believe the thoughts you have shared with me?
8. Are these thoughts generally the same throughout sparring and/or in every sparring session? Degree of variance  
If they change ask why

*(We are now going to move away from reflections on your training sessions. You will now be asked to reflect on your boxing competitions).*

### **Bout**

Please think of boxing competitions you have taken part in Do your best to remember what you usually think during bouts.

1. Do your best to remember what you usually say to yourself at the beginning and during bouts. Please share those thoughts.  
 \*Please share any other thoughts that you usually say to yourself during warm up.
2. Please share any other thoughts that you usually say to yourself during bouts.
3. Do the thoughts you have just shared reflect what you usually say to yourself during bouts?  
 \*If so, how much (out of 10) do the thoughts you have shared reflect what you usually say to yourself in bouts?
4. Do you say these thoughts in your head or out loud?  
 \* If so, how often (out of 10) do you say them in your head?

5. Are there times when you go through bouts without talking to yourself?  
 \* If so, how often (out of 10) does that happen often?
6. You have shared your thoughts during bouts, are you usually aware of those thoughts during warm up?  
 \* If so, when are you most aware?
7. Please share with me how helpful you find your thoughts to be during bouts are.  
 \* How helpful are your thoughts (out of 10)?  
 \* Which of the thoughts you have shared are most helpful/unhelpful to you?
7. These thoughts that you have shared with me (helpful/unhelpful), do you believe them?  
 \* How much (out of 10) do you believe the thoughts you have shared with me?
8. Are these thoughts generally the same throughout and/or in every bout round?  
 Degree of variance  
*If they change ask why*

**Comparing sparring with competition is your ST different? How different? (frequency? Content? Consistency?)**

We have spent quite some time talking about what you usually say to yourself during training and competitions. You have shared a lot about your thoughts but before we finish, if there is anything else that you think may be useful for this study related to your training and competition thoughts, please use the remaining minutes to share that.

***Thank you for taking time to share your boxing thoughts and experiences.***



## **Appendix R** *Think Aloud Guide*



### **Think Aloud Guide**

#### **Study 1:** Self-Talk Awareness, Beliefs and Usage

##### **Instructions:**

1. During your shadow boxing and punch bag sessions of the next training I will hook an audio recorder onto your clothes with a headset on your head.
2. I will need you to do your best to say out loud your thoughts as they occur during shadow boxing and punch bag sessions.
3. It may feel awkward but try to proceed with your shadow boxing and punch bag sessions saying out loud your thoughts.
4. There is no right or wrong thing to think and say, just say your thoughts naturally, as they occur.
5. If you forget to say your thoughts don't stop the session, keep going, I will remind you.
6. If at any time during the Think Aloud recordings you want to discontinue, please let me know, we will discontinue the recording without consequences.

***Thank you for taking time to share your boxing thoughts and experiences.***

## **Appendix S Coaching Behaviour Study Documents**



### **PARTICIPANT INFORMATION**

**Phd Project Title:** Investigating Self-talk Awareness, Beliefs, Usage and Influences: Implications for Effective and Skill-Targeted Self-Talk Interventions

**Study 2:** Coaching Behaviour Impact on Self-Talk Content

**Name of Researcher:** Kagiso N. Tlhabano

**School of Sport & Exercise Science**

You are being invited to take part in a research study. Before you decide on whether to take part or not it is important that you understand why the research is being done and what it involves. Please take time to read the following information. Ask us questions if there is anything that is not clear or if you would like more information. Take time to decide if you want to take part or not.

#### **7. What is the purpose of the study?**

Research has shown that coaches are very important and influential in the lives of athletes, especially in relation to training and competitions. It has been suggested that coaches' behaviour influences what athletes say to themselves during competitions. This study will explore the influence of coaches behaviours on what you say to yourself (thoughts) during training and competition.

#### **8. Do I have to take part?**

Taking part in this study is voluntary. It is up to you to decide whether or not to take part. If you do you will be given this information sheet, have the purpose of the study verbally explained and asked to sign a consent form. You are still free to withdraw at any time without giving a reason. A decision to withdraw will not affect your rights/any future treatment/service you receive."

#### **9. Who can take part in the study?**

- Male/female boxing athletes
- Aged between 18 to 26 years of age
- Have at least 12 months boxing experience
- Have inter-club competition experience

#### **10. What will happen to me if I take part?**

- You will be video recorded during one sparring competition sessions. At the same time, your coaches will be video and audio recorded during the same sparring and competition sessions.
- Within two days of the sparring and competition recordings you will watch the video and listen to the accompanying audio recording of your coach. Thereafter you will be

asked questions regarding your thoughts during sparring/competition and how the coaches' words and actions influenced those thoughts. This interviews will be audio recorded and each will last up to 60 minutes.

- The sparring and competition recordings will be conducted during one of your normal training sessions and inter-club tournaments.

#### **11. Are there any risks / benefits involved?**

During the course of the study you will not be exposed to any risk beyond what your usual training and competitions expose you to. You may however, experience discomforts during video recordings and interviews. Although this study will not take much of your time, you may still find the interview times inconvenient. To reduce the level of inconvenience the two interviews will be scheduled at a time most convenient for you. The benefits of this study is that it will give us information that will be useful in preparing a self-talk intervention tailored for you.

#### **12. Will my taking part in the study be kept confidential?**

The information you share during the study will be kept confidential throughout the study and when the findings are shared in conferences and/or in publications. Direct quotes of information you shared will be anonymous.

**This study has received ethical approval from the University of Botswana's Research Ethics Committee** (*insert REC reference number and date of approval*)

**Contact Details of Researcher:** [K.N.Tlhabano@2016.ljmu.ac.uk](mailto:K.N.Tlhabano@2016.ljmu.ac.uk) (+ 267 355 2290)

**Contact Details of Academic Supervisor:** D.A.Tod@ljmu.ac.uk (+ 44 15190 46241)

**If you any concerns regarding your involvement in this research, please discuss these with the researcher in the first instance. If you wish to make a complaint, please contact [researchethics@ub.bw](mailto:researchethics@ub.bw) and your communication will be re-directed to an independent person as appropriate.**



## INTERVIEW GUIDE

### Study 2: Coaching Behaviour Influences on Self-talk

#### Instructions:

1. During the next hour you will watch a video recording of yourself sparring/competing. You will also listen to a recording of what the coach was saying during the same sparring/bout. As you watch yourself and listen to the coach I need you to do your best to remember that sparring/bout and your interactions with the coach. At the end of each round's recordings we will pause and talk about that round until we have watched and talked about all the recorded rounds for the specified sparring/competition. There are no right or wrong answers to the questions, you only need to share your experiences and thoughts as best as you can remember them.
  2. Do not feel hurried, take your time to respond to questions and to talk about the recordings.
  3. Use any language you prefer between Setswana and English.
  4. Be free to seek clarification if at any time when the question is not clear to you.
  5. If at any time during this interview you do not want to continue, please let me know and we will discontinue the interview without consequences.
- 
1. Please share thoughts that came to your mind when you were playing this round.
    - \* Are there any other thoughts that came to mind? Please share.
  2. Please share what the coach did/said that you remember hearing or seeing during sparring/bout.
    - \*Anything else that you remember? Please share.
  3. As the coach was saying...or doing...what did you say to yourself?
    - \*Is there anything else that you were thinking while coach was saying...or doing...? Please share.
  4. Would you say what the coach did/said influenced what you said to yourself (your thoughts) during that round?
    - \*If so, was it helpful influence or not helpful?
    - \* Where *1 is not at all* and *10 is very much*, how much did the coaches actions and words influence your thoughts?
  5. Thinking about the round you have just watched, please share what else besides the coach influenced your thoughts and actions during that round.
    - \* Where *1 is not at all* and *10 is very much*, how much did...influence your thoughts?
  6. During the sparring/bout you have just refreshed your memory in, can you think of anything else, in and outside the ring that influenced your self-talk (to what degree?)

***Thank you for taking time to share your boxing thoughts and experiences.***



### CONSENT FORM - ORIGINAL

**PhD Project Title:** Investigating Self-talk Awareness, Beliefs, Usage and Influences:  
Implications for Effective and Skill-Targeted Self-Talk Interventions

**Study 2:** Impact of Coaching Behaviour on Self-Talk Content

**Researcher:** Kagiso N. Tlhabano

**School of Exercise ad Sport Science**

7. I confirm that I have read and understand the information provided for the above study. I have had the opportunity to read the information, ask questions and have had these answered satisfactorily.
8. I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason, and that this will not affect my legal rights.
9. I understand that any personal information collected during the study will be made anonymous and remain confidential.
10. I agree to take part in the above study interviews and observations of my training and competitions.
11. I understand that the interviews, training and competitions observations will be audio and video recorded and I am happy to proceed.
12. I understand that parts of our conversations may be used verbatim in future publications or presentations but that such quotes will be made anonymous.


Name of Participant	Date	Signature
.....	.....	.....
Name of Researcher	Date	Signature
.....	.....	.....
Name of Person taking consent (if different from researcher)	Date	Signature
.....	.....	.....

## **Appendix T** *Experimental Study Documents*



### **PARTICIPANT INFORMATION**

**Phd Project Title:** Investigating Self-talk Awareness, Beliefs, Usage and Influences: Implications for Effective and Skill-Targeted Self-Talk Interventions

**Study 3:** Self-Talk Intervention Effectiveness

**Name of Researcher:** Kagiso N. Tlhabano

**School of Sport & Exercise Science**

You are being invited to take part in a research study. Before you decide to take part or not to it is important that you understand why the research is being done and what it involves. Please take time to read the following information. Ask us questions if there is anything that is not clear or if you would like more information. Take time to decide if you want to take part or not.

#### **13. What is the purpose of the study?**

Research has shown that what we say to ourselves out loud or as thoughts in our heads has an impact on our actions. It been shown that what athletes say to themselves during their sporting activity can help them do better or worse. We call what we say to ourselves self-talk. This study will carry out a self-talk intervention to help you practice and learn to control your thoughts during your competitions and see how helpful the intervention is for you.

#### **14. Do I have to take part?**

Taking part in this study is voluntary. It is up to you to decide whether or not to take part. If you do you will be given this information sheet, and the purpose of the study will be verbally explained, then asked to sign a consent form. You are still free to withdraw at any time without giving a reason. A decision to withdraw will not affect your rights/any future treatment/service you receive.”

#### **15. Who can take part in the study?**

- Male/female boxing athletes
- Aged between 18 to 26 years of age
- Have 12 months boxing experience
- Have inter-club competition experience

#### **16. What will happen to me if I take part?**

- You will take part in a self-talk intervention where you will practice self-talk three days a week during your normal training in shadow boxing, punch bag and sparring. You will also be expected to take part in the usual inter-club tournaments every 2 weeks where your bouts will be video recorded.

- The study will last six months which will be divided into two phases. Phase 1 will be the first 4 months during which you will be working with the researcher every week. Three to four months after the conclusion of phase 1 there will be a follow-up phase (Phase 2) where two of your bouts will be video recorded in a space of two months.
- Before the intervention starts you will have an individual session where you are told about what self-talk is, how it works and how the practice sessions will take place. Other individual sessions will take place during the course of the study as part of the intervention process.
- Throughout the study (Phase 1 and 2) you will take part in brief interviews immediately after recorded sparring sessions and bouts.
- Throughout phase 1 you will work with the researcher and your coach to develop and practice self-talk cues that can help you improve defensive, offensive, feinting, work rate and punching skills that you need to improve.
- In the follow up phase only your competitions will be recorded.
- At the end of the intervention and the follow phase you will be interviewed about your experiences related to the intervention.

#### **17. Are there any risks / benefits involved?**

During the course of the study you will not be exposed to any risk beyond what your usual training and competitions exposes you to. You may however, experience discomforts during interviews, and as a result of the researcher's unusual constant presence and observations during your training for the duration of the study. It is also possible that you will be uncomfortable knowing you are being recorded. You are also likely to find the study inconvenient, especially during phase 1 where you will need to be available weekly for 4 months and to not miss a tournament during those 4 months. The benefits of the study are that this study will help us understand the usefulness of a self-talk intervention among Botswana boxers, and teach you how to control your thoughts in order to enhance your boxing performance and in life in general

#### **18. Will my taking part in the study be kept confidential?**

The information you share during the study will be kept anonymous and confidential throughout the study and when the findings are shared in conferences and/or in publications.

**This study has received ethical approval from the University of Botswana's Research Ethics Committee** (*insert REC reference number and date of approval*)

**Contact Details of Researcher:** [K.N.Tlhabano@2016.ljmu.ac.uk](mailto:K.N.Tlhabano@2016.ljmu.ac.uk) (+ 267 355 2290)

**Contact Details of Academic Supervisor:** D.A.Tod@ljmu.ac.uk (+ 44 15190 46241)

**If you any concerns regarding your involvement in this research, please discuss these with the researcher in the first instance. If you wish to make a complaint, please contact [researchethics@ub.bw](mailto:researchethics@ub.bw) and your communication will be re-directed to an independent person as appropriate.**



## CONSENT FORM

**PhD Project Title:** Investigating Self-talk Awareness, Beliefs, Usage and Influences:  
Implications for Effective and Skill-Targeted Self-Talk Interventions

**Study 3:** Self-Talk Intervention Effectiveness

**Researcher:** Kagiso N. Tlhabano

**School of Exercise and Sport Science**

13. I confirm that I have read and understand the information provided for the above study. I have had the opportunity to read the information, ask questions and have had these answered satisfactorily.

☐

14. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and that this will not affect my legal rights.

☐

15. I understand that any personal information collected during the study will be made anonymous and remain confidential.

☐

16. I agree to take part in the above study intervention, interviews and recording of my training and competitions.

☐

17. I understand that the interviews, training and competitions will be video and/or audio recorded and I am happy to proceed.

☐

18. I understand that parts of our conversations may be used verbatim in future publications or presentations but that such quotes will be made anonymous.

☐

Name of Participant

Date

Signature

.....

Name of Researcher

Date

Signature

.....

Name of Person taking consent  
(if different from researcher)

Date

Signature

.....





## MANIPULATION CHECKS GUIDE

### Study 3: Self-Talk Intervention & Follow Up

#### Instructions:

1. During the next 20 minutes I will ask you questions relating to the sparring/bout you have just taken part in. There are no right or wrong answers to the questions, you simply share your experiences and thoughts as best as you can remember them.
2. Do not feel hurried, take your time to respond to questions.
3. Use any language you prefer between Setswana and English.
4. Be free to seek clarification if at any time when the question is not clear to you.
5. If at any time during this interview you do not want to continue, please let me know and we will discontinue the interview without consequences.

#### Manipulation Checks

1. Did you use the self-talk cues you planned to use?
  - \* Please share which self-talk cues you used during sparring/bout.
  - \* Please tell me the specific moment (what was happening) when you used those self-talk cues.
  - \* Where *1 is not at all* and *10 is all the time*, how much did you **use your planned** self-talk cues?
  - \* Where *1 is not at all* and *10 is all the time*, how much did you **believe your planned** self-talk cues?
2. Did you use any other self-talk cue that was not in your plan?
  - \* Please share which unplanned self-talk cue(s) did you use?
  - \* Where *1 is not at all* and *10 is all the time*, how much did you **use the unplanned** self-talk cues?
  - \* Where *1 is not at all* and *10 is very much*, how much did you **believe the planned** self-talk cues?
3. Did what the coaches said and did influence your self-talk cue(s)?
  - \* Please tell me which self-talk cues were influenced and by which coaching behaviour
  - \* Where *1 is not at all* and *10 very much*, how much do you think the **coaches behaviour** influenced your **planned** self-talk cues?
  - \* Where *1 is not at all* and *10 is very much*, how much do you think the **coaches behaviour** influenced your **unplanned** self-talk cues?
4. During your sparring/bout was there **anything else** that influenced your planned self-talk cues?
  - \* Please share which self-talk cues were influenced?
  - \* Where *1 is not at all* and *10 is very much*, how much do you think these **other things** influenced your **planned** self-talk cues?
5. Did your self-talk cues change during rounds?
  - \* Where *1 is not at all* and *10 is very much*, how much did your ST cues change/
  - \* How much ST did you use in round 1 (out of 10), round 2 (out of 10) round 3 (out of 10) and round 4 (out of 10).

\*Why do you think they did?

6. Is there anything else that you think will be useful for me to know about your self-talk cues during sparring/bout?

***Thank you for taking time to share your sparring/bout thoughts and experiences.***



## INTERVIEW GUIDE

### Study 3: Post Self-Talk Intervention and Follow Up

#### Instructions:

1. During the next half hour I will ask you questions relating to the past 10 weeks where you learnt about your self-talk, decided which skills you wanted to improve, which self-talk cues you will use for those skills and from week to week you practiced those self-talk cues. During this process you took part in competitions. There are no right or wrong answers to the questions, you simply share your experiences and thoughts as best as you can remember them and how you can.
  2. Do not feel hurried, take your time to respond to questions and to talk about the recordings.
  3. Use any language you prefer between Setswana and English.
  4. Be free to seek clarification if at any time when the question is not clear to you.
  5. If at any time during this interview you do not want to continue, please let me know and we will discontinue the interview without consequences.
- 
1. Please share how this whole experience of learning about, practising and using self-talk cues has been for you.
  2. Please share what stood out more for you during this process (intervention). Anything else?
  3. Please tell me why such stood out for you.
  4. What did you find most useful for you during this time?  
\* Where *1 is not at all* and *10 is very much*, how useful was ... for you?
  5. What else was very useful for you during this time?  
\* Where *1 is not at all* and *10 is very much*, how useful was ... for you?
  6. What was least useful for you?  
\* Where *1 is not at all* and *10 is very much*, how was ... least useful for you?
  7. What else was least useful for you?  
\* Where *1 is not at all* and *10 is very much*, how was ... least useful for you?
  8. Of the things you found useful, which ones do you intend to use in your boxing going forward?  
\* Where *1 is not at all* and *10 is very much*, how much do you intend to use...going forward?
  9. What didn't the researcher do during the past 10 weeks that would have been very useful for you?
  10. Please share anything else that you think would be useful for me to know about your experience of the past 10 weeks.
- Thank you for taking time to share your thoughts and experiences of the past 10 weeks.***