



University of Thessaly

Department of Physical Education and Sport Sciences

An Exploration of the Content and Structure of Exercise-related Self-talk

by

Nikita Satish Bhavsar

The present thesis is submitted as Partial Fulfillment of the Requirements for the Degree of European Master of Sport and Exercise Psychology at The University of Thessaly in July, 2015

Approved by supervising committee:

Main Supervisor: Nikos Zourbanos, PhD

Supervisor 1: Antonis Hatzigeorgiadis, PhD

Supervisor 2: Yannis Theodorakis, PhD

Trikala, Greece 2015

Declaration by Author

This thesis is composed of my original work, and contains no material previously published or written by another person except where due reference has been made in the text. I have clearly stated the contribution by others to jointly-authored works that I have included in my thesis.

I have clearly stated the contribution of others to my thesis as a whole, including statistical assistance, survey design, data analysis, significant technical procedures, professional editorial advice, and any other original research work used or reported in my thesis. The content of my thesis is the result of work I have carried out since the commencement of my research higher degree candidature and does not include a substantial part of work that has been submitted to qualify for the award of any other degree or diploma in any university or other tertiary institution. I have clearly stated which parts of my thesis, if any, have been submitted to qualify for another award.

I acknowledge that electronic and hard copies of my thesis must be lodged with the University Library.

I acknowledge that copyright of all material contained in my thesis resides with the copyright holder(s) of that material.

Nikita Satish Bhavsar

Abstract

The current study explored the content of self-talk in the exercise setting. Ninety exercisers ($M = 34.70$ years, $SD = 10.38$) with varied exercise experience completed the thought listing technique in 3 minutes at 30 minutes and 60 minutes into their workouts. Items thus generated were screened, edited and categorized by 3 experts, independently from one another. Resultant items and categories on which consensus was reached were subsequently subjected to a test of item content relevance analysis by 5 experts. The analyses revealed six positive exercise-related categories (*Psyching up*, *Psyching down*, *Positive evaluation acute outcomes*, *Instruction*, *Long term positive outcome expectations*, and *Motivation*), four negative exercise-related categories (*Worries/Doubts*, *Self-critical thinking/Negative evaluation*, *Disengagement/Boredom*, and *Fatigue*) and one exercise-unrelated category (*Irrelevant thoughts*). The current investigation provides a thorough description of what exercisers say to themselves while they exercise, and can aid better understanding of the role of self-talk in exercise promotion and adherence.

Keywords: Self-talk, exercise, thought listing

Table of Contents

ABSTRACT.....	iii
TABLE OF CONTENTS.....	iv
LIST OF TABLES.....	v
LIST OF FIGURES.....	vi
INTRODUCTION.....	1
LITERATURE REVIEW.....	2
Acute thoughts.....	3
Self-talk.....	7
METHODS.....	7
Participants.....	8
Procedure.....	9
Data Analysis.....	10
RESULTS.....	11
Item content relevance analysis.....	17
The expert panel.....	17
Rating scale procedure.....	17
Data analysis.....	18
DISCUSSION.....	21
LIMITATIONS.....	27
FUTURE RECOMMENDATIONS.....	27
CONCLUSION.....	28
REFERENCES.....	29
Appendix A. Self-talk Form.....	34
Appendix B. Content Analysis Rating Form.....	38
Appendix C. Summary of Mean Ratings & Inter-rater agreement.....	51

List of Tables

Table 1.Frequencies as per gender, history of exercise & self-reported exercise intensity.....	8
Table 2.Participants' age and frequency of exercise.....	9
Table 3.Frequency of activities undertaken at the gym.....	9
Table 4.Process of categorization.....	13

List of Figures

Figure 1. Hierarchical tree representing final categorization.....	20
--	----

Introduction

According to the World Health Organisation (WHO), exercise is physical activity (PA) that is planned, structured, repetitive, and aims to improve or maintain one or more components of physical fitness. PA is thus any bodily movement that requires energy expenditure. Some benefits of engagement in moderate to vigorous intensity of regular PA include improved cardiovascular fitness, improved bone health, weight control, lowered risk for cardiovascular diseases, cancers, as well as depression (WHO, 2015). On the other hand, inactivity and sedentary lifestyles have health consequences. Insufficient PA is a leading risk factor for mortality globally and has been adding to the load of non communicable diseases along with other risk factors, including tobacco use, unhealthy diets and harmful use of alcohol (WHO, 2010). Although there exists a widespread awareness about the benefits of regular PA and the risks of insufficient PA, individuals continue to lead inactive and sedentary lifestyles.

Frequently cited reasons for not exercising include not having enough time, energy or even motivation for exercise (Weinberg & Gould, 2011). While it is a challenge to initiate exercise behavior, it is even more difficult to stick to it, as is demonstrated by the consistently confirmed statistic of the 50% attrition rate in the first 6 months among individuals taking up exercise programs (Dishman, 1982, 1994; Resnick & Spellbring, 2000; Berger, Pargman, & Weinberg, 2002). The impact of such dropouts and relapses can be limited if exercisers learn to anticipate them and develop self-regulatory skills to cope with them (Weinberg & Gould, 2011). One such self-regulatory skill is self-talk. Self-talk can be described as what people say to themselves either silently or out loud, inherently or strategically in order to stimulate,

direct, re-act and evaluate events and actions (Hatzigeorgiadis, et al., 2014) . Any individual who has engaged in some form of exercise might have engaged in self-talk at some point in time (St. Clair Gibson & Foster, 2007), which explains the necessity to explore how the content of exercisers' self-talk may influence their motivation or the lack of it. However, it is surprising how little attention has been given to the inherent nature of self-talk. While the sporting experience can serve as a guideline (e.g., Zourbanos, Hatzigeorgiadis, Chroni, Theodorakis, & Papaioannou, 2009), the exploration of the content of self-talk among recreational exercisers can differ from that of athletes (Morgan & Pollock, 1977).

The awareness of one's self-talk and the ability to tune into it can prove to be facilitative to interventions targeting exercise promotion and maintenance, as has been suggested by Ives who stated that 'the use of self-talk before, during, and after exercise can help an exerciser to motivate him or herself to adhere to an exercise program' (2011, p. 23). The purpose of this thesis is thus, to explore the content of self-talk among individuals who are already engaging in exercise behavior. Adequately describing what forms the content of self-talk among such individuals during exercise is an essential first step in understanding the role of self-talk in the exercise setting.

Literature Review

In the area of exercise, acute thoughts and self-talk have typically been examined and will be reviewed in the following paragraphs. Acute thoughts are cognitions that occur when individuals are considering translating their exercise plans into action (Gyurcsik & Brawley, 2000). As such, these thoughts occur before the exercise behavior takes place. Acute thoughts can be positive (encouraging the individual's immediate decision to carry on the planned exercise e.g., benefits and positive outcome expectations of exercise) or negative (hindering

an individual's decision to exercise e.g., thinking about the barriers to, or excuses for exercise, etc.). The frequency and valence of such acute thoughts operate together to influence any motivated behavior, in this case, that of exercise (Bandura, 1986). The term self-talk has prevailed in sport psychology literature and can be defined as verbalizations addressed to the self, which are multidimensional in nature, having interpretive elements associated with the content of the statements employed, is somewhat dynamic and serves motivational and instructional functions for the athlete (Hardy, 2006). While the relationship between self-talk and thoughts has not been clearly defined (St. Clair Gibson & Foster, 2007), it has been suggested that self-talk occurs any time one thinks about something, and that one cannot have conscious thoughts without the occurrence of self-talk (Bunker, Williams, & Zinsser, 1993; Athens, 1994; Gammage, Hardy, & Hall, 2001).

Acute thoughts

Kendzierski and Johnson (1993) made the first attempt to measure acute thoughts in the exercise setting. Their 25-item Exercise Thoughts Questionnaire (ETQ) identified frequently occurring negative exercise thoughts or excuses for not exercising, such as, 'I haven't got the time' and 'I'm too tired to exercise'. It was found that the frequency of negative exercise thoughts experienced in the previous week had a negative correlation with the intention to exercise, self-reported exercise behavior during that week as well as after three months.

Extending the work of Kendzierski and Johnson (1993), Gyurcsik and Brawley (2000) attempted to establish if the frequency of acute positive and negative exercise thoughts (retrospective and anticipated) experienced by exercise participants is related to self-efficacy beliefs, intentions, and exercise behaviors. The researchers asked participants to list three

most frequent thoughts they experienced during the past week while deciding whether to exercise and describe the frequency of each thought. It was found that adults who exhibited more positive acute thoughts displayed higher self-efficacy and attendance as compared to their negative-thinking counterparts. Overall thought frequency was found to be predictive of self-efficacy, which in turn was predictive of future intention and exercise adherence. Despite of this difference in attendance, negative thinkers still managed to adhere to their exercise program in a consistent manner, with a high attendance rate of 75%, implying that although exercisers may experience negative thoughts, they can cope with these in order to maintain consistency in exercising (Gyurcsik & Brawley, 1999; Gyurcsik & Estabrooks, 2004). Strategies include cognitive ones, such as replacing a negative thought, 'I will be too tired to exercise later' with a positive one, 'exercise will give me energy', or behavioral ones, such as performing a certain behavior like calling a friend to make plans to exercise together after experiencing the acute negative thought.

Further research on acute thoughts in exercise found that there are characteristic differences among individuals as a function of their acute thoughts and previous exercise consistency (Gyurcsik, Brawley, & Langhout, 2002). Positive thinkers differed from negative thinkers by their significantly lower experiences of decisional struggle and higher experiences of coping self-efficacy. Furthermore, consistent exercisers encountered lower decisional struggle, higher coping self-efficacy, greater intention to exercise, and more positive affect as compared to inconsistent exercisers.

Self-talk

In establishing a framework for self-talk in the exercise settings, Gammage, Hardy, and Hall (2001) explored the where, when, what, and why of self-talk in exercise by using

open ended questions on 164 exercise participants from a health sciences course. Over 95% of their participants reported engaging in self-talk. Self-talk was reportedly used at the exercise location and during exercise. Typically, participants used more neutral self-talk as compared to positive or negative self-talk, possibly due to the authors' limited definitions and the dangers in having the researchers' assess and classify the self-talk instead of the exercisers. This was in the form of short phrases, mostly referring to themselves in the second person. With regards to the function, self-talk was used for motivational (mastery, arousal, and drive) and cognitive (skill, specific, and general) purposes. Specifically, the content of self-talk was made up of task instructions, the amount of exercise remaining, results that involved appearance, feeling, and health benefits, as well as the goals of the exercisers.

O' Brien Cousins and Gillis (2005) investigated 40 adults born before 1960 in order to determine if active individuals used self-talk to motivate themselves. Eighty eight percent of the respondents said they used self-talk strategies, for example pep-talks, to remind themselves of their goals as well as the benefits of exercise. Some others said they even avoided 'activity self-talk' and decided to 'just do it' (exercise) before they could change their minds and skip exercising altogether. The authors concluded that in the process of selection of individuals to target with positive messages about PA and exercise, the stage of change of that individual as well as their willingness to exercise, are crucial.

Research by St. Clair Gibson and Foster (2007) also described most of the self-talk used during exercise as being positive or neutral. The authors focused on the association/dissociation that occurs when individuals exercise, and in line with previous work on this topic (Schomer & Connolly, 2002), stated that lower intensity exercises are characterized by dissociative conversational chatter. Conversely, the percentage of associative

thoughts relating to the exerciser's affect, body, pace monitoring, and instructions is greater when the exercise intensity increases. Self-talk created a distance between the activities described by the self-talk, and the self-talk itself which allowed for reflection on what is going on, and self awareness about the part that the exerciser plays in this process. Self-talk may also allow the exerciser to take an outsider's perspective in analyzing the activity, which enables retrospective analysis of this activity, concluding that, 'ST may play a pivotal part in the success or failure of an exercise bout' (St. Clair Gibson & Foster, 2007, p. 1042).

More recently, Ives (2011) studied individuals' exercise self-talk and the thoughts that prevent or encourage participants to exercise regularly. In this study, both adherers and non-adherers reported using self-talk measured by the Self-Talk Questionnaire (S-TQ; Zervas, Stavrou, & Psychountaki, 2007) at a similar frequency, suggesting that the frequency of self-talk is unrelated to its effectiveness during exercise. Further responses to open-ended questions indicated that its effectiveness is, in fact, related to the type of self-talk that is used during exercise and the point in time during exercise when it is used, making the knowledge of how and when to use self-talk a factor that contributes to the adherers' exercise maintenance. A limitation of this study was the use of the S-TQ, a measure originally intended for the sport setting. This might not have translated well to the exercise domain explaining the similar reports of self-talk use by both, adherers and non-adherers. In conclusion, the author stressed the need to 'determine an effective way of measuring an exerciser's self-talk' (Ives, 2011, p. 46)

The limited research on self-talk and thoughts in exercise does not accurately describe what exactly makes up individuals' self-talk while they exercise, which stresses the need for a conceptual framework for the same. The ETQ, a measure of the frequency with which participants report reasons for not exercising was developed and tested only on college

students. More importantly, it does not take into consideration idiosyncratic and acute positive thoughts, which might serve as a buffer (Gyurcsik and Brawley, 2000). There also exists the need for investigating self-talk in a more heterogeneous population, with varied exercise experience in order to fully understand the content of self-talk in exercise (Gammage et al., 2001). Most of this research until date has employed open-ended questions in a retrospective manner which brings into play forgetting or imperfections in reconstructing the memories (Nisbett & Wilson, 1977). Finally, exercisers' inherent self-talk during an exercise session, at the location of the exercise remains unexplored.

In the current study, in order to obtain and explore the most salient self-talk statements, the thought listing technique (Cacioppo & Petty, 1981; Glass & Arnkoff, 1997) was first employed at two points in time during an ongoing exercise session. Statements obtained from exercise participants were classified into categories by employing content analysis (Boyatzis, 1986; Braun and Clarke, 2006). Next, item content relevance analysis (Dunn, Bouffard, & Rogers, 1999) was employed in order to assess the appropriateness of items. The current study additionally serves as a quintessential first step in the development of an instrument assessing self-talk in exercise to better understand the role of self-talk in exercise promotion and adherence.

Methods

Participants

In the current study, the sample consisted of 90 exercisers (67 females, 23 males), with the mean age 34.70 years (± 10.38)¹ recruited from three gymnasiums in Greece, who exercised an overall average frequency of 3.49 days/week ($\pm .98$) The exercisers participated in different activities, including various combinations of activities, such as weight training (67.8%), running (63.3%), aerobics (61.1%), TRX (44.4%), pilates (43.3%), yoga (38.9%), and cycling (21.1%)². A total of 64.4 % participants³ reported exercising at a gym for over six months. Finally, with regards to the self-reported intensity of the workout, 2.2% of the participants exercised at a low intensity, 45.6 % at a moderate intensity, and 52.2% reported exercising at a vigorous intensity.⁴

Table 1. Frequencies as per gender, history of exercise and self-reported exercise intensity

		Frequency	Percent
Gender	Males	23	25.6
	Females	67	74.4
History*	Less than 6 months	29	32.2
	More than 6 months	58	64.4
Intensity	Low	2	2.2
	Moderate	41	45.6
	Vigorous	47	52.2

Notes: * 3 missing values, due to which the total is not 100 %

¹ N= 86, 4 missing values

² Exercisers participated in various combinations of these activities. Percentages represent the popularity of the activity

³ N= 87, 3 missing values

⁴ Some participants reported engaging in activities outside of the gym, consisting of a variety of sports and walking, which were not included in the descriptive statistics

Table 3. Participants' age and frequency of exercise

	N	Minimum	Maximum	Mean	Std. Deviation
Age	86*	15	60	34.70	10.387
Ex Frequency	90	2	6	3.49	.974

*Notes: *4 missing value*

Table 2. Frequencies of activities undertaken at the gym

Exercise	Frequency	Percent
Weight training	61	67.8
Running	57	63.3
Aerobics	55	61.1
TRX	40	44
Pilates	39	43.3
Yoga	35	38.9

Notes: Percentages express the popularity of the activity

Procedure

After obtaining ethical approval from the University Ethics Committee, we contacted the owners and managerial staff of the gymnasiums and explained to them the purpose of the study. Further special permission was obtained for administration of the questionnaire half-way through group exercise sessions. It was decided that the participants would only be informed about a 'task' that they had to complete during their workout, without any details about the purpose in

the beginning, as this would give them time to think about what they were going to write for the thought listing technique. As the aim was to obtain the most salient thoughts and not leave any room for generation and deletion of portions, only a brief interval of three minutes was allowed, but at two different time points (Cacioppo & Petty, 1981). Participants were then approached at the 30 minute mark of their workout, where they were given a brief idea about self-talk and asked to complete the first part of the thought listing procedure (Cacioppo & Petty, 1981; Glass & Arnkoff, 1997). The exercisers were asked to write down as many thoughts as possible in 3 minutes about what they said to themselves during the initial 30 minutes of their exercise session. At 60 minutes into their exercise session, the participants were required to repeat the thought listing technique in 3 minutes for the other 30 minutes of their workout. Finally, the exercisers filled in a demographic details questionnaire. While the questionnaire was initially developed in English by the researcher, it was subsequently translated to Greek in order to overcome any language barrier.

Data Analysis

Initially, a fitness instructor and a student of sport science (both bilingual) translated the statements obtained in Greek to English. Back translation was conducted by two other bilingual sport science students (for more information see, Harkness, 2003, p. 41). The original Greek version was then compared with the back-translated version, where errors and discrepancies were identified and corrected. Next, these translated statements were subjected to content analysis (Braun & Clarke, 2006), in a manner similar to that employed by Zourbanos et al. (2009) in their first stage of the development and validation of a measure of athletes' self-talk. Statements obtained from the thought listing procedure were categorized by three experts in the field of sport and exercise psychology, with particular expertise in self-talk, independently from

one another. While two of the experts held academic positions in the sport science department of a university, the third was a Master's student in sport and exercise psychology. Initially, complex thoughts were broken down into single subject thoughts. These were also screened in order to eliminate or edit statements that lacked meaning, were synonymous, or incomprehensible. The thoughts were then classified into any system of categories according to the content of the responses. Emergent categories were to be mutually exclusive and exhaustive. Following their independent categorization, the three experts came together in order to secure agreement on the obtained categories. It was decided that the categories on which the experts did not unanimously agree upon with regards to the themes or the description of the content would be deleted. However, if a significant amount of statements did not fit any of the proposed categories, these would be retained until the next stage, to see if a new category emerged.

Results

The thought listing technique generated 400 statements (of which 224 statements were from the 30 minute mark and 176 from the 60 minute mark). Of these, 200 positive statements related to exercise (96 statements were from the 30 minute mark and 104 statements from the 60 minute mark), 84 negative statements related to exercise (of which 49 statements were obtained from the 30 minute mark and 35 from the 60 minute mark), and 116 unrelated to exercise (of which 79 were obtain from the 30 minute mark and 37 from the 60 minute mark) entered the process of elimination.⁵ Following identification of single subject thoughts, screening, and editing, 116 positive, 55 negative, and 45 unrelated statements were acquired. The three experts then categorized these 216 statements independently from one another.

⁵ The purpose of employing the thought listing technique at two time points was only to facilitate generation of the most salient self-talk statements, for which reason, these results were not analyzed in detail.

Initially, six positive, five negative, and four unrelated categories were proposed. However, it was decided that some categories would be renamed in a more appropriate manner, some others would be merged together, and some would be deleted (Table 4). At the end, consensus was reached on 10 categories for 154 items. From these 10, 5 categories included 97 positive statements, 4 categories included 52 negative statements, and 1 irrelevant category included 5 exercise-unrelated statements. Lastly, 15 positive statements remained that did not fit into any of the existing categories, and it was decided to retain these for the next analysis in order to see if a new separate category emerged.

Table 4. Process of categorization

CATEGORY	Expert 1	Expert 2	Expert 3
1. Psyching up	X (worded psych up)	X (proposed changing to psyching up)	X (proposed changing to psyching up)
2. Psyching down	X (worded arousal control)	X (proposed changing to psyching down)	X (proposed changing to psyching down)
3. Confidence	X	Proposed merging with Positive evaluation acute outcomes	Proposed merging with Positive evaluation acute outcomes
4. Instruction	X	X	X
5. Outcomes	X (included outcomes of health, appearance and mood)		
6. Positive evaluation of self and the exercise	X		
7. Positive evaluation acute outcomes		X Proposed merging confidence and positive evaluation of acute outcomes of exercise	X Proposed merging confidence and positive evaluation of acute outcomes of exercise
8. Positive evaluation long term outcomes		X Proposed a separate category for more long term outcomes of exercise and their positive evaluation	X Proposed a separate category for more long term outcomes of exercise and their positive evaluation
9. Worries/Doubts	X (Worded 'Concerns')	X (proposed renaming it as worries/doubts)	X (proposed renaming it as worries/doubts)
10. Self-criticism/ Negative evaluation	X (Originally termed 'Self-critical thinking', did not include items of negative evaluation)	X (proposed renaming and merging)	X (proposed renaming and merging)
11. Disengagement/ Boredom	X	X	X
12. Fatigue	X	X	X
13. Negative evaluation of exercise	X	Proposed merging	Proposed merging
14. Irrelevant thoughts	X (Originally further categorized into tasks, family, leisure, other health)	X (proposed discontinuing further categorization)	X (proposed discontinuing further categorization)

Notes: X indicates that an expert proposed the given category, followed by comments for consideration

Consensus was reached to retain the following categories:

1. *Psyching up*

This category included six positive statements used by the exercisers in order to charge themselves up, energize themselves and maximize their effort, such as ‘Give your best’, ‘More power’, and ‘Go harder’.

2. *Psyching down*

Eight statements referring to what exercisers say to themselves in order to calm themselves down or to control their level of arousal were included in this category. Examples include, ‘Relax’, ‘Rest’, and ‘Take a breath’.

3. *Positive evaluation acute outcomes*

Many of the items from the originally proposed categories of *Confidence*, *Positive evaluation of self-and exercise* as well as some *Outcomes* of exercise, specifically the mood-related outcomes were indicative of acute effects of exercise. These categories were merged together on the suggestions of Experts 2 & 3 in order to create a more appropriate category named ‘*Positive evaluation acute outcomes*’. Included were the positive evaluations and assessments that exercisers made, which referred to their state at that particular point in time while exercising, about the acute or short term outcomes of exercise, as well as of their mood or goals. 41 statements such as ‘I feel more relaxed in the end than what I felt when I started’, ‘Exercise changes my mood, making it more positive’, and ‘I feel great’ were a part of this category.

4. *Instructions*

Exercisers gave themselves directives or commands with regards to performing the exercise, techniques, or strategies. This category comprised of 12 directives such as, ‘Maintain this form’, ‘Try to increase repetitions for abs’, and ‘Focus, to breathe right, so that the exercise is easier’.

5. *Positive evaluation long term outcomes*

Statements initially included in the category *Outcomes* proposed by Expert 1 reflected many health and appearance related, long-term results of exercise. Following consultation with Experts 2 and 3, and given the creation of the category, *Positive evaluation acute outcomes* it was decided to include the rest of the statements in a new category called *Positive evaluation long-term outcomes*. 18 statements referring to positive assessments of long-term results of exercise, exercise goals and expectations related to health and appearance were included in this category. Examples include, ‘I’m expecting my physical appearance (body) to be better with training’ and ‘I’m doing something for myself and my body’.

6. *Worries/ Doubts*

This category contained negative statements reflecting concern on the exerciser’s part, his/her skepticism regarding the workout, as well as anxiety inducing thoughts. A total of nine statements such as, ‘I’m concerned about injuries while exercising’ and ‘I’m afraid what the trainer will tell me about the extra weight when I come next time!’ were included.

7. *Self-criticism/ Negative evaluation*

While *Self-critical thinking* and *Negative evaluation of exercise* were listed as two different categories by Expert 1, as *Negative evaluation of exercise* had too few items to comprise a

category independently, consensus was reached on merging these together as proposed by Experts 2 & 3. The final category, called *Self-criticism/ Negative evaluation* encompassed 17 statements referring to self-criticism on part of the exerciser, e.g., ‘My thighs look fat when I lay down’, and negative assessment of oneself and the exercise. e.g., ‘I’m working out in a sloppy way’.

8. *Disengagement/ Boredom*

This category was made up of exercisers’ wishes to discontinue their workout, to give up, as well as their lack of enthusiasm. 15 statements such as ‘I can’t stand 1 hour of training’, ‘Maybe I’ll give up halfway’, and ‘Exercise is boring’ were included in this category.

9. *Fatigue*

Incorporated in this category were the statements relating to physical tiredness or any unpleasant bodily sensations experienced by the exercisers. Included were 10 statements such as, ‘I’m dead. The trainer killed me, ‘I can’t even get up and drive home’, and ‘It’s so painful if you want to have a nice body’.

10. *Irrelevant thoughts*

Finally, as the total number of statements was still relatively high, it was decided to discontinue with the further sub categorization proposed by Expert 1, and include only one statement from each of the subcategories of exercise-unrelated thoughts that were proposed by Expert 1 (one each from *Tasks, Family and Friends, Leisure, and Health*) in order to form this final category. A total of five items were included in this category to reflect the thoughts unrelated to exercise

that exercisers might be dwelling on, such as ‘Issues troubling my family and friends’ and ‘My work/job’.

Item content relevance analysis

Following categorization of the 154 items, these were put to test through an analysis of item-content relevance by expert judges. Item-content relevance analysis refers to ‘the degree to which the subject matter or content contained within an item is representative of the target construct that the item is designed to measure’ (Dunn, Bouffard, & Rogers, 1999). As such, content-relevance serves to be a vital source of validity information pertaining to content validity.

The expert panel. Following the suggestions of Lynn (1986) that a minimum number of five judges should provide an adequate level of control among the raters, and considering time and the number of experts available, it was decided to include five judges in the expert panel. Of these, three judges held PhDs in sport and exercise psychology (with specific research interests in self-talk) along with academic positions at sport science faculties at two different universities. The fourth judge was a psychologist by profession with a higher degree in sport and exercise psychology, while the last judge was a postgraduate student of sport and exercise psychology with a background in exercise and fitness instruction.

Rating scale procedure. First, all categories obtained from the content analysis performed in stage 1, which the items were intended to measure, were defined for the judges to acquaint themselves with these domains. The judges were sent the rating form via email and were instructed to rate the degree of match between the item content and the categories provided for all the items on a 5-point rating scale (1 = *poor match*, 2 = *fair match*, 3 = *good match*, 4 =

very good match, 5 = *excellent match*). The aim of this matching task protocol was quantification of item ratings, and evaluation and summary of these in a quantitative statistical manner. The judges were requested to familiarize themselves with the categories before proceeding to the rating. In case any of the items could not be adequately described by any of the predefined categories, an additional category called 'other - specify' was provided in order to make suggestions. Judges were also instructed to include the items in more than one category, if they deemed it more appropriate, and were requested to provide any comments concerning the grammar, wording, and content of the items.

Data analysis. Given the time constraint, and as only five judges were available to rate the statements in the current study, we only considered each item's mean rating for its key domain, and the summary of the number of evaluators who matched an item to its key domain (inter-rater agreement), along with any additional domain selection where the judges considered an item to be more appropriate. While a higher inter-judge consensus for an item's match to its intended category shows the strength of an item in that particular category, the mean ratings present preliminary evidence regarding the extent to which the item can be held content relevant.

Items that met inter-rater agreement levels of 3-5 (60% - 100%) together with a minimum mean rating 3 for their designated category were retained. An exception was made for categories with fewer than seven items, where all items were retained irrespective of inter-rater agreement and mean ratings. Judges' comments on the better fit for items in a category other than the one it was intended to measure were taken into consideration and such items were moved to the more suitable category. Such items had failed to meet either of the previously defined minimum inter-rater agreement and mean rating for their present category, and had an inter-rater agreement of 4

(80%) or more for the more suitable category). Additionally, mean rating for the more appropriate category had to be 3 or higher in order for the item to be retained after moving.

Following this analysis, 15 items were excluded from the positive categories as they exhibited an inter-rater agreement of less than 60% and mean rating lower than 3 for their key domain. Specifically, one item from *Psyching down*, 12 from *Positive evaluation acute outcomes*, and two items from *Positive evaluation long term outcomes* were deleted. For the negative categories, only two items from *Self-criticism/negative evaluation* were omitted for not reaching these standards. Taking into consideration judges' suggestions, five items were moved from *Positive evaluation acute outcomes* to *Psyching up*, following which one item was deleted as its mean was lower than 3. One item was moved from category *Positive evaluation acute outcomes* to category *Positive evaluation long term outcomes*.

For the previously uncategorized items, mean ratings could not be considered as judges' agreed that the statements did not match any pre-defined category. Their comments suggested overall elements of motivation in statements in which participants engaged in cognitive restructuring to keep exercising, or reminded themselves of incentives for exercising. This new category was labeled 'Motivation', and included 15 statements such as, 'Some exercise is better than nothing', 'Tomorrow I'll be feeling sore, but that means I worked out', and 'First sweating and then relaxing with a hot shower'. Lastly, one of the judges from the panel suggested renaming the category 'Positive evaluation of long term outcomes' to 'Long term positive outcome expectations', which seemed as a valid proposition, and was successfully incorporated. The final categorization along with the number of statements in each category is illustrated in Figure 1.

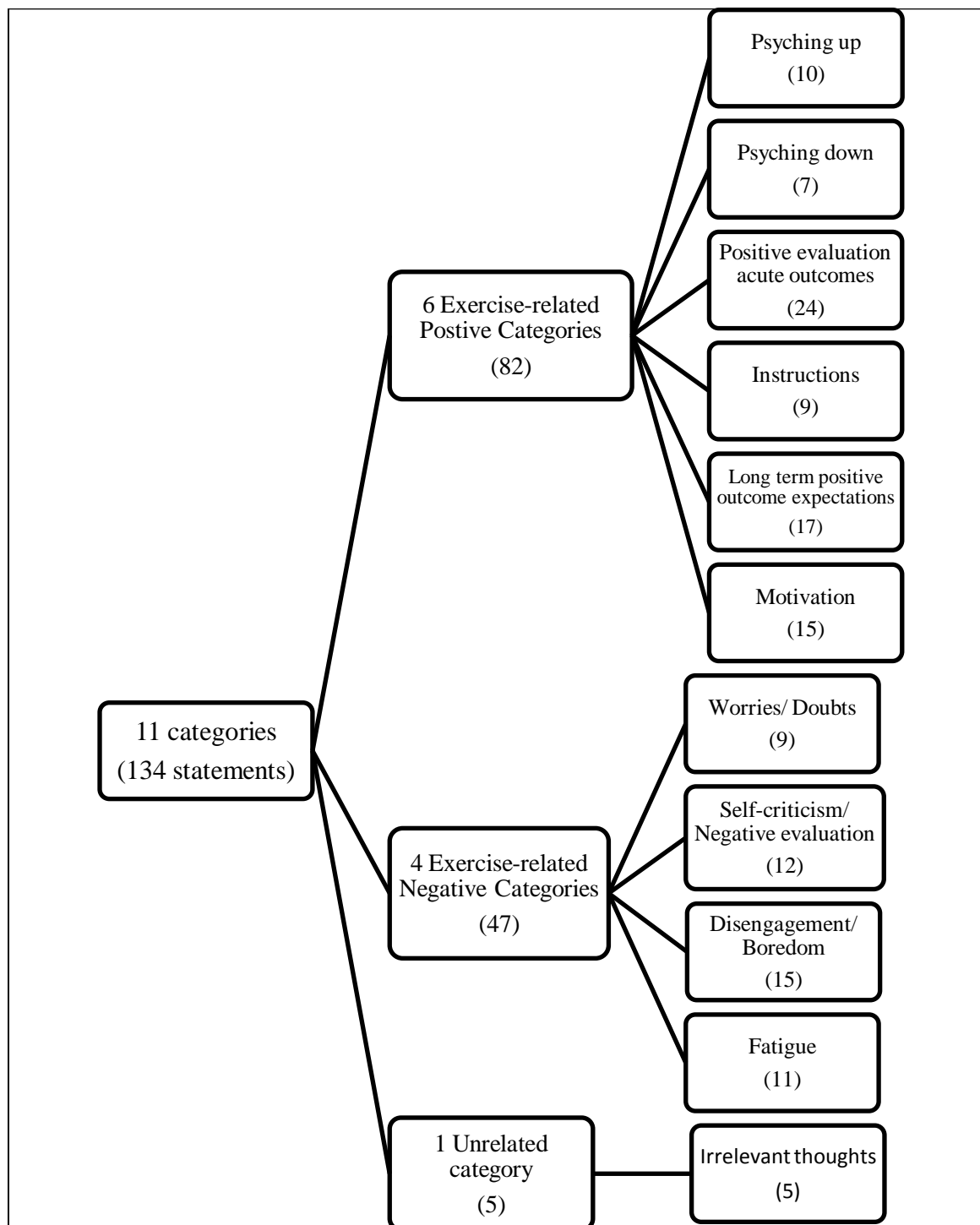


Fig. 1. Hierarchical tree representing the final categorization of self-talk statements during exercise

Discussion

The current study attempted to explore the content of self-talk among exercisers and thereby served as a crucial first step in the development of a psychological testing instrument to assess the same. Drawing from the findings of Gammage et al. (2001) that exercisers frequently used self-talk at their exercise location and during exercise, we employed the thought listing technique, followed by content analysis and a test of item content relevance analysis in order to shed light on the categories of self-talk that exercisers typically engage in.

The actual content of self-talk was described by a total of 11 categories, from which 6 were exercise-related positive categories, 4 exercise related negative categories, and 1 category that was unrelated to exercise. Positive categories were those of *Psyching up*, *Psyching down*, *Positive evaluation acute outcomes*, *Instruction*, *Long term positive outcome expectations*, and *Motivation*. The negative categories included *Worries/Doubts*, *Self-critical thinking/Negative evaluation*, *Disengagement/Boredom*, and *Fatigue*. The final category for the exercise-unrelated statements was labeled *Irrelevant thoughts*. It should be noted that the process of categorization was based solely on the content of the statements and not their effects or consequences.

With regards to what exercisers said in order to excite or energize themselves, and increase their level of arousal, statements and phrases included, for example, 'Go harder', 'I can take this/I got this' and 'Give your best'. This category was labeled *Psyching up*. Statements in this category were consistent with those included by Zourbanos et al. (2009) in their category of 'Psych up' in the Automatic Self-talk Questionnaire for Sports. Psyching up has been found to increase dynamic strength, muscular endurance, and power, not just in sports such as Olympic

lifting, but also for individuals with some experience in strength training (Tod, Iredale McGuigan, Strange, & Gill, 2005).

The second category labeled *Psyching down* included statements such as ‘Relax’, ‘Take a break’, and ‘Listen to the music and forget the pain’ and referred to regulating or decreasing arousal. Psyching down, in the form of anxiety control can typically be observed in a sport setting (Zourbanos et al., 2009). Anxiety-related sensations can be comparable to the increased perceived rate of exertion, heart rate, and perspiration that follow intense bouts of exercise, and might be especially unpleasant for novice exercisers (Ekkekakis & Backhouse, 2014). For such exercisers, reminders to calm down might serve to be beneficial. This result is supported by findings of Gammage et al. (2001) who reported participants’ use of such self-talk for the purpose of relaxation, but also to avoid or relieve boredom.

Category 3 with statements such as, ‘Stress, worries and negative thoughts are thrown away’, and category 5 with ‘I’ll have an incredible body for the summer’ reflected positive assessments of acute outcomes of exercise and that of more long-term outcome expectations, and were labeled *Positive evaluation acute outcomes* and *Long term positive outcome expectations* respectively. Statements in these two categories were consistent with the findings of Gammage et al. (2001) with regards to their categories of *Results* and *Goals* which made up the content or the ‘*what*’ of self-talk. Reminders of one’s current state, ‘I feel great’, immediate outcomes of exercise, ‘I feel like flying out of joy and wellbeing’ as well as what one might achieve if he/she is consistent, ‘I will be in shape’ may enable one to keep on exercising, or even lead to increased effort (Gammage et al., 2001). Items from our categories also correspond with those from the Outcome Expectations for Exercise Scale (OEE; Resnick, Zimmerman, Orwig, Furstenberg, & Magaziner, 2000), which was based on Bandura’s theory of self-efficacy (1986), in saying that

outcome expectations or beliefs that engaging in a specific behavior will lead to a desired outcome, are important in adoption and maintenance of exercise behavior (Resnick et al., 2000)

Similar to automatic thoughts in sports (Zourbanos et al., 2009) the next category *Instructions* consisted of commands and directives that the exercisers gave to themselves. These included ‘Maintain this form’, ‘Pay attention to the length of the break’, and ‘Focus on the efficiency’ or ‘Try to increase the repetitions for abs’. Findings from Gammage et al. (2001) additionally suggest that exercise routines involve a need to allocate attention specifically to how a movement is performed and generally to strategies for improving one’s performance, to get the most from one’s workout as well as to avoid injury.

The final positive category was characterized by statements eliciting motivational elements and was designated *Motivation*. Statements consisted of re-structuring states of boredom or tiredness, ‘The aerobics part makes me feel bored after a bit, but it’s good for me’, participant’s plans for exercise at that moment as well as for a later point in time, ‘I will try to come to the gym more frequently’, and incentives for working out, ‘I’m going to have a relaxing bath once it’s over’. With regards to reframing, Gyurcsik and Estabrooks (2004) have demonstrated that individuals who are consistent with their exercise routines use cognitive and behavioral coping strategies in order to deal with these thoughts. O’ Brien Cousin’s (2003) research with older adults resonates this finding in that even the active adults in her study experienced negative thoughts and barriers to exercise, however, they countered these with strong positive dialogues and solutions. It becomes evident that strategies such as restructuring and reinforcement management to overcome barriers to exercise is characteristic of the action stage of behavior change, where exercise has become a more established behavior (Buckworth, Dishman, O’Connor, & Tomporowski, 2013).

In the current study we classified negative self-talk statements experienced during the workout into four categories. The first category, *Worries/ Doubts* encompassed statements relevant to exercisers' concerns and uncertainties. Statements such as, 'I'm concerned about injuries while exercising' and 'How am I going to make it through the workout?' which could create skepticism about exercising and potentially cause the exerciser to discontinue, were observed. While the sport setting is characterized by worries relating to performance (Zourbanos et al., 2009), it seems that exercisers tend to be concerned about getting injured from exercise, their ability to successfully complete the exercise session and doubts about whether or not they will see results from all the effort they put into the workout.

Self-criticism/ Negative evaluation stood as an independent category, which was characterized by negative assessment of oneself for not meeting set standards or expectations. Examples include, 'I've gained extra weight' and 'I'm not exercising enough'. Research has suggested that setting high personal standards, is not necessarily pathological in nature, but engaging in self-criticism along the way can be an indicator of compulsive exercise behavior among female exercisers (Taranis & Meyer, 2010).

The third category called *Disengagement/ Boredom included* statements relating to discontinuation or quitting, 'Maybe I'll give up halfway' and lack of enthusiasm, 'Exercise is boring'. This was followed by the last category *Fatigue*, with statements such as 'I'm exhausted from exercising' and 'I think I shouldn't try more, the tiredness is prevailing'. These findings are in line with those of Zourbanos et al. (2009) whose automatic self-talk categories in sport include both disengagement and somatic fatigue.

As Anshel (2014) illustrates, it is apparent that physical exercise places challenging demands on individuals. One cannot smoothly transition from living a relative sedentary life to making health gains in the snap of a finger. An exercise behavior change includes various challenges and setbacks in the form of doubts about health gains, boredom, lack of patience, pessimism, injuries, and relapses, even for individuals who have consistently lead active lifestyles. Negative thinking can impair the development of the habit of exercising, especially for novice participants, resulting in low expectations, and in that process, lowers one's performance.

The final category *Irrelevant thoughts* represented exercise unrelated self-talk. Despite of obtaining a large number of unrelated statements, only five were included in this category, to represent the major themes that developed, e.g., 'My job/work', 'Issues troubling my family and friends' etc. It is worth mentioning, that although they were not included in the categorization, a high number of such thoughts referred to active planning and scheduling of errands, work, and appointments, while others involved along observations of the weather, and surroundings, consistent with Stevinson and Biddle's (1999) classification of internal and external dissociation.

Our findings also support previous research with regards to a greater use of positive than negative self-talk (Mahoney & Avnes, 1977; Sellar, 1997; St. Clair Gibson & Foster, 2007). However, it should be noted that our classification was based solely on the content of the self-talk, without taking into consideration it's consequences, for example, that an exerciser might in fact be using negative self-talk in order to motivate himself/ herself, which highlights the suggestion of Gammage et al. (2001) to further study why exercisers use self-talk in addition to what they say.

Additionally, while this was not a major purpose of our study, it was found that while moving from 30 minutes of exercise to 60 minutes of exercise, the number of exercise-related positive statements showed a slight increase (from 96 to 104), the number of exercise-related negative statements displayed a slight decrease (from 49 to 35), and exercise unrelated statements exhibited a big decrease (from 79 to 37) from the 30 minute to the 60 minute mark. One explanation for the decreased number of exercise-unrelated self-talk statements in the last 30 minutes could be the increased exercise intensity and effort towards the end of a session. An increase in intensity marks an attentional shift from dissociation to association, signaling the arrival of exhaustion / termination (Tenenbaum, 2001). This discomfort is a common cause of exercise dropout. Strategies delaying this shift can lead to a longer time on task and reduce the rate of perceived exertion (Blanchfield, Hardy, De Morree, Staiano, & Marcora, 2014), especially for endurance tasks. Self-talk can be such a strategy. Dissociative self-talk can help to push the shift, but it becomes unavoidable at a certain point. At this stage, positive self-talk in the form of allocating attention to the technique (*Instructions*) to maintain and increase effort (*Psyching up, Psyching down, Positive evaluation acute outcomes, Long term positive outcome expectations*), as well as to cope with the aversive sensations (*Motivation*) can be beneficial to the exercisers.

Our data could also be explained by that proposed by Latinjak, Zourbanos, López-Ros, & Hatzigeorgiadis (2014), who aimed to introduce a new perspective of goal-directed and undirected self-talk into sport psychology. According to the authors, spontaneous, goal-undirected self-talk (unintended thoughts that come to mind effortlessly) referred to past outcomes and foreseeing upcoming events and could be classified according to valence (positive or negative) as well as a time perspective (retrospective, present and anticipatory). On the other

hand, goal-directed self-talk included attaining control over cognitions and activation for action, and could be classified according to activation (activated, neutral, deactivated), and time orientation (past, past-present, present-future, and future oriented). However, as the current study is exploratory in nature with a gradual aim of obtaining a simple categorization for the development a questionnaire, we do not recommend such a complex and theoretically based analysis.

The present study is, however, bound by certain limitations. Although our sample was relatively heterogeneous, we could not draw conclusions based on gender, exercise history/experience and type of exercise. Consistent with Gammage et al. (2001) it is also possible that the excerpt describing self-talk in the questionnaire may have primed participants' responses. Additionally, the inclusion of more judges for the test of item content relevance analysis could have enabled a more statistically sound test, such as Aiken's V (Aiken, 1985). Finally, translations and back translations might have led to loss of valuable information.

With regards to future recommendations, this area of research is still in its infancy and warrants further investigation. Future assessments of exercisers' self-talk could attempt using think aloud techniques or stimulated recall. The self-talk of individuals exercising at other locations, such as parks and stadiums can also be explored. In extending the present study, the next logical step would be to administer the rating form to more judges in order to establish statistically significant item content relevance. In using the current study as the basis for the development of an instrument to assess exercisers' self-talk, exploratory and confirmatory factor analyses may serve to develop a psychologically sound instrument.

Conclusion

In conclusion, the current exploratory study provides a basis for understanding the role of self-talk during exercise by providing a rather thorough description of its content. Exercisers primarily engage in positive self-statements, phrases and words, in order to psych themselves up and down, to give themselves directives, to remind themselves of the long and short term outcomes and outcome expectations of exercise, and finally to keep motivating themselves to continue by restructuring and reinforcing themselves via incentives. Having said that, exercisers also engaged in negative self-talk, in the form of concerns, self-criticism, disengagement from exercise and somatic fatigue, which might lower participant's exercise effort and motivation. Lastly, exercise unrelated thoughts make up a significant portion of what participants say to themselves. Looking at self-talk as a phenomenon that can be altered by training (Blanchfield, et al., 2014), interventions aiming at selectively manipulating self-talk about wanting to quit, or failure to previously adhere could in fact be helpful. However, attention needs to be paid to altering other kinds of self-talk, such as the inner voices relaying information to slow down or those about the intensity being too vigorous. Such self-talk might, in fact be teleologically protective (St. Clair Gibson & Foster, 2007).

References

- Aiken, L.R. (1985). Three coefficients for analyzing the reliability and validity of ratings. *Educational and Psychological Measurement*, 45, 131–142.
- Anshel, M.H. (2014). Applied health fitness psychology. Champaign, IL: Human Kinetics.
- Athens, L. H. (1994)The self as soliloquy. *Sociology Quarterly*, 35, 521-32.
- Bandura, A. (1986). *Social foundations of thought and action*. Englewood Cliffs, NJ: Prentice Hall.
- Berger, B. G., Pargman, D. and Weinberg, R. S. (2002). Foundations of Exercise Psychology, Morgantown: Fitness Information Technology, Inc.
- Blanchfield, A. W., Hardy, J., De Morree, H. M., Staiano, W., and Marcora, S. M. (2014). Talking yourself out of exhaustion: the effects of self-talk on endurance performance. *Medicine and Science in Sports and Exercise*. 46, 998–1007.
- Boyatzis, R.E. (1998). *Transforming qualitative information: Thematic analysis and code development*. London: Sage.
- Braun, V., & Clarke, V.(2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77-101.
- Buckworth,J., Dishman, R.K ., O'Connor, P.J., Tomporowski, P.(2013). Exercise Psychology, 2nd Edition, Champaign, IL: Human Kinetics
- Cacioppo, J.T., & Petty, R.E. (1981). Social psychological procedures for cognitive response assessment: The thought listing technique. In T. Merluzzi, C. Glass, & M. Genest (Eds.), *Cognitive assessment* (pp. 309–342). New York: Guilford.
- Cohen, J. (1977). *Statistical power and analysis for the behavioural sciences*. (Rev. ed.)New York: Academic.

- Dishman, R.K. (1982). Health psychology and exercise adherence. *Quest*, 32, 116-180.
- Dishman, R., & Sallis, J. (1994). Determinants and interventions for physical activity and exercise. In C. Bouchard, R. Shepard & T. Stephens (Eds), *Physical activity, fitness and health: International preceding and consensus statement*. Champaign, Il. Human Kinetics. 214-238.
- Dunn, J.G.H., Bouffard, M., & Rogers, W.T. (1999). Assessing item content-relevance in sport psychology scale-construction research: Issues and recommendations. *Measurement in Physical Education and Exercise Science*, 3, 15–36.
- Ekkekakis, P., & Backhouse, S.H. (2014). Physical activity and feeling good. In A. Papaioannou & D. Hackfort (Eds.), *Routledge companion to sport and exercise psychology: Global perspectives and fundamental concepts* (pp. 687-704). New York: Routledge.
- Gammage, K. L., Hardy, J., & Hall, C. R. (2001). A description of self-talk in exercise. *Psychology of Sport and Exercise*, 2,233–247.
- Glass, C.R., & Arnkoff, D.B. (1997). Questionnaire methods of cognitive self-statements assessment. *Journal of Consulting and Clinical Psychology*, 6, 911–927.
- Gyurcsik, N. C., & Brawley, L.R. (1999). Exercise and the power of positive thinking. *Weight Control Digest*, 9, 859, 865-867.
- Gyurcsik, N. C., & Brawley, L. R. (2000). Mindful deliberation about exercise: Influence of acute positive and negative thinking. *Journal of Applied Social Psychology*, 30, 2513-2533.

- Gyurcsik, N. C., Brawley, L. R., & Langhout, N. (2002). Acute thoughts, exercise consistency, and coping self-efficacy. *Journal of Applied Social Psychology, 32*, 2134-2153.
- Gyurcsik, N. C., & Estabrooks, P. A. (2004). Acute exercise thoughts, coping, and exercise intention in older adults. *Journal of Applied Social Psychology, 34*(6), 1131 -1146.
- Harkness, J. (2003). Questionnaire translation. In: J.A. Harkness, F. J. R. Van de Vijver and P. P. Mohler. *Cross-cultural Survey Methods* (Eds., pp. 35–56). New York: Wiley.
- Hatzigeorgiadis, A., Zourbanos, N., Latinjak, A.T., & Theodorakis, Y. (2014). Self-talk. In A.G. Papaioannou & D. Hackfort (eds), *Routledge companion to sport and exercise psychology: global perspectives and fundamental concepts* (pp.371-385)
- Ives, A. (2011). Examination of self-talk and exercise adherence (Doctoral dissertation, TEMPLE UNIVERSITY).
- Kendzierski, D., & Johnson, W. (1993). Excuses, excuses, excuses: A cognitive behavioral approach to exercise implementation. *Journal of Sport and Exercise Psychology, 15*, 207-219.
- Lynn, M. R. (1986). Determination and quantification of content validity. *Nursing Research, 35*, 382-385.
- Mahoney, M., & Avener, M. (1977). Psychology of the elite athlete: An exploratory study. *Cognitive Therapy and Research, 6*, 225-342.
- Nisbett, R. & Wilson, T. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review, 84*, 231–259.
- O' Brien Cousins, S., & Gillis, M. (2005). “Just do it...before you talk yourself out of it”: The self talk of adults thinking about physical activity. *Psychology of Sport and Exercise, 6*, 313-334.

- Resnick, B., & Spellbring, A. (2000). Understanding what motivates older adults to exercise. *Journal of Gerontological Nursing, 26*(3), 34-42.
- Schomer, H., & Connolly, M. (2002). Cognitive strategies used by marathoners in each quartile of a training run. *South African Journal for Research in Sport, Physical Education & Recreation, 24*, 87-99.
- St. Clair Gibson, A., & Foster, C. The role of self-talk in the awareness of physiological state and physical performance. *Sports Medicine, 37*(12), 1029-1044.
- Stevinson, C.D. & Biddle, S.J.H. (1999). Cognitive strategies in running: A response to Masters and Ogles (1998). *The Sport Psychologist, 13*, 235-236.
- Taranis, L., & Meyer, C. (2010). Perfectionism and compulsive exercise among female exercisers: High personal standards or self-criticism? *Personality and Individual Differences, 49*, 3-7.
- Tod, D. A., Iredale, K. F., McGuigan, M.R., Strange, D. E. O., & Gill, N. (2005). "Psyching-up" enhances force production during the bench press exercise. *Journal of Strength and Conditioning Research, 19* (3), 599-603.
- Weinberg, R.S. & Gould, D. (2011). *Foundations of Sport and Exercise Psychology*, (5th Ed.). Champaign, IL: Human Kinetics.
- World Health Organization (2010). Global Health Observatory (GHO) Data. Retrieved from http://www.who.int/gho/ncd/risk_factors/physical_activity/en/
- World Health Organization (2015). Factsheet number 385. Retrieved from <http://www.who.int/mediacentre/factsheets/fs385/en/>

Zervas, Y., Stavrou, N.A., & Psychountaki, M. (2007). Development and validation of the Self Talk Questionnaire (S-TQ) for Sports. *Journal of Applied Sport Psychology, 19*, 142–159.

Zourbanos, N., Hatzigeorgiadis, A., Croni, S., Theodorakis, Y., & Papaioannou, A. (2009). Automatic Self-Talk Questionnaire for Sports (ASTQS): Development and preliminary validation of a measure identifying the structure of athletes' self-talk. *The Sport Psychologist, 23*, 233-251.

Appendix A: Self-talk form

On the following pages you are asked to fill out some questionnaires referring to your thoughts about your participation at the gym. The questionnaires are anonymous and therefore all the data collected will be confidential. In the questions that you are asked to answer, there are no right or wrong answers. Please answer with honesty. Thank you.

PLEASE READ THE INSTRUCTIONS CAREFULLY

BEFORE COMPLETING THE QUESTIONNAIRE

I hereby wish to participate in this survey and I will answer honestly

Signature

Age:

Gender:

- Male
- Female

Length of time having engaged in exercised at a gym:

- Less than 6 months
- 6 months or more

Frequency of exercise behavior: days per week

- 1
- 2
- 3
- 4
- 5
- 6
- 7

Type of exercise engaged in:

- Running
- Cycling
- Aerobics
- Strength Training
- Yoga/Pilates
- Others (please specify)

Intensity of exercise:

- Light
- Moderate
- Intense

Please specify any other physical activity or sport that you engage in outside of a gymnasium:

Dear Participant,

This survey is to explore the content of your self-talk, that is, what you say to yourself during your exercise session. Your self-talk might be something you say to yourself out loud, or inside your head. It could be positive, negative or neutral and could be words or phrases that you use to instruct or to motivate yourself. Thus, your self-talk may help or harm your motivation to engage in exercise. You are now requested to think of your recently completed exercise session and recall anything you thought about or said to yourself during exercising. You can write down words, phrases and sentences. There is no right or wrong answer. You are requested to write down as many thoughts as possible in a period of 3 minutes.

List of thoughts from 30 minutes of exercise :

List of thoughts from 60 minutes of exercise:

Appendix B: Content Analysis Rating Form

INSTRUCTIONS:

Dear Raters,

In the following table are statements relating to what exercisers say to themselves during their workout. Please review each of the items/ statements in the following table and classify them into the mentioned categories on a 5 point rating scale (1 = *poor match*, 2 = *fair match*, 3 = *good match*, 4 = *very good match*, 5 = *excellent match*) with regards to the relevance of the content.

Items can be included in one or more categories, if appropriate. We would also appreciate comments on the wording and grammar of the items.

Prior to proceeding, please familiarize yourselves with the categories to which you are requested to match the self-talk statements:

1. **Psyching up:** This includes statements used by the exercisers in order to charge themselves up, energize themselves and maximize their effort
2. **Psyching down:** Statements included refer to those used by the exercisers to control their arousal or to calm themselves down
3. **Positive evaluation acute outcomes:** This category includes statements relating to positive evaluations and assessments of current, acute or short term outcomes of exercise, about their current state, mood or goals.
4. **Instruction:** In this category, statements include directives or commands the exercisers give themselves, for e.g. with regards to the method of exercising

5. **Positive evaluation long term outcomes:** This includes statements involving positive evaluations of long term outcomes of exercise, such as health and appearance.
6. **Worries/Doubts:** Included are statements related to the exerciser's concerns and those causing the exerciser to get anxious.
7. **Self-criticism/Negative evaluation:** Statements in this category refer to self-critical thinking on part of the exerciser, as well as a negative evaluation of oneself, or the exercise.
8. **Disengagement/ Boredom :** Included are statements referring to the exercisers wish to discontinue from the activity as well as a lack of enthusiasm.
9. **Fatigue:** This category includes statements involving physical tiredness or unpleasant bodily symptoms experience by the exerciser.
10. **Irrelevant thoughts:** Statements in this category are unrelated or irrelevant to exercise.
11. In case a statement does not match a pre-defined category, please classify it into '**Other-Specify**' along with a specification for the same.

	SELF-TALK	CATEGORIES										
		1.Psyching up	2.Psyching down	3.Positive evaluation acute outcomes	4.Instructions	5.Positive evaluation long term outcomes	6.Worries/doubts	7.Self-criticism/negative evaluation	8.Disengagement/Boredom	9. Fatigue	10.Irrelevant thoughts	11. Other-specify
1.	Go harder											
2.	Keep going on											
3.	Almost there!											
4.	Give your best!											
5.	More power !											
6.	Super!											
7.	Let it out											
8.	Be optimistic											
9.	I need to be patient											
10.	Relax											
11.	Take a breath!											
12.	Rest/take a break											
13.	Listen to music and forget the pain											
14.	I shouldn't quit											
15.	I have achieved my goal until now											
16.	I can do even better											
17.	I can take this /I got this											
18.	I'm trying although I'm fat											
19.	My body is strong											
20.	Feeling powerful!											
21.	I can do more , I want more											
22.	I can do it at this intensity, which is											

	good											
23.	I did it!											
24.	It may be small, but it gives me the boost to go on and rise higher											
25.	Well done! /I did great today											
26.	I'm still learning, so it's reasonable to feel tired.											
27.	It's worth the effort and time											
28.	I feel great/well/good/pleasant											
29.	I feel euphoric/happy.											
30.	I feel more relaxed/more cheerful/ more euphoric/less stressed) in the end than I what I felt when I started											
31.	Stress/worries/negative thoughts are thrown away											
32.	I'll feel beautiful after the workout is done											
33.	Exercise gives me energy for the rest of the day											
34.	It clears up my mind, I feel calm/peaceful											
35.	Exercise changes my mood, making it more positive											

36.	All my troubles and my daily issues can be dealt with, with a smile.											
37.	I'll feel better when I finish working out											
38.	I feel like flying out of joy and wellbeing!											
39.	Exercise is good for me, mentally											
40.	Feeling satisfied for completing the workout.											
41.	I feel younger.											
42.	Feeling like I've already lost some weight already											
43.	Until now, the workout went well.											
44.	I like what I do.											
45.	I'm glad that I'm exercising											
46.	I enjoy exercising !/ Exercise is fun											
47.	The exercises suit me perfectly!											
48.	I feel a nice tiredness											
49.	I'm starting to get flexible											
50.	Today's workout is great											
51.	I'm happy that my lower back doesn't hurt at all!											
52.	I liked it although it was tough today											

	It was tiring but effective.											
53.	I 'm glad I exercised although I'm bored or tired.											
54.	Fatigue and exhaustion, but at the same time feeling alive and full of positive energy											
55.	I was completely relaxed, especially towards the end with the music											
56.	I'm getting better everyday.											
57.	Focus, to breathe right, so that the exercise is easier.											
58.	Try to increase the repetitions for abs.											
59.	Focus on the technique / Maintain this form / correct your posture											
60.	Remember to drink water more often.											
61.	Pay attention to the length of the break(between exercises)											
62.	Focus on the intensity											
63.	Let's go for another one!											
64.	Again, from the top/beginning of the set!											
65.	Focus on the efficiency											

66.	I will be in shape.											
67.	I'm expecting my physical appearance (body) to be better with training											
68.	I really want to be fit with a flat belly											
69.	I'll have an incredible body for the summer.											
70.	I want my body to become better											
71.	I want to be thin											
72.	I'm going to make(build) a great body.											
73.	The workout just brings me closer to the body of my dreams.											
74.	I feel that I'm improving my physical condition and that I'm trying											
75.	My heart rate will improve											
76.	I will burn fat.											
77.	I'm doing something for myself and my body											
78.	I want to improve my performance											
79.	I want to improve aspects of my physical fitness (strength/stamina/endurance)											

80.	I'm reaching my target											
81.	Exercise is good for me											
82.	I'm giving to myself											
83.	I want to have a good workout today.											
84.	Looking forward to next time											
85.	I don't feel too tired,yet.											
86.	I'm tired, but I'm going to try making the first 30 minutes.											
87.	I'm not in the mood, but I'll try											
88.	The aerobics part makes me feel bored after a bit, but it's good for me.											
89.	Some exercise is better than nothing											
90.	I'm going to have a relaxing bath once it's over											
91.	I should be training longer.											
92.	I can feel the muscle tension											
93.	First sweating and then relaxing with a hot shower.											
94.	I look forward to taking a bath and relaxing..											
95.	I will try to come to the gym more frequently.											

96.	I believe next time it won't be that painful.											
97.	Tomorrow I'll be feeling sore, but that means I worked out .											
98.	How am I going to make it through the workout?											
99.	I don't have the time to exercise											
100	I'm afraid what the trainer will tell me about the extra weight when I come next time!											
101	When will the exercise program start seeming easy to me?											
102	Oh, I wish I could see a change in my body											
103	How tired will I feel?											
104	I hope I don't get tired quickly											
105	I'm concerned about injuries while exercising											
106	I'm concerned how the pain will go away											
107	I can't run											
108	My stamina is not good											
109	I won't become better.											
110	I'm working out in a sloppy way.											
111	I've gained extra weight											

112	I'm getting worse											
113	I'm not exercising enough!											
114	I get tired too easily.											
115	My thighs look fat when I lay down.											
116	I'm ashamed that I'm Breathless, feeling tired and grossly sweaty											
117	Disappointed, because my lower back bothered me											
118	Losing weight isn't easy at all											
119	Oh my God no, there's more!											
120	I don't have time to meet up with my girlfriends over coffee because of exercise											
121	These exercises are so difficult											
122	Thank God it's over/ At last it's over											
123	Who does the trainer think I am? An athlete?											
124	I can't continue!											
125	Naa.. I'll stop.											
126	Maybe I'll give up halfway											
127	I just want to finish											
128	I'm giving up											

129	When will it end?! 50 minutes left											
130	I find this pointless											
131	I can't stand 1 hour of training											
132	I want to leave to make it in time for my errands											
133	I should have avoided working out											
134	Perhaps I shouldn't come tomorrow (to the gym)											
135	I just want to go home and relax											
136	Exercise is boring											
137	I feel dull on seeing the exercises that are difficult											
138	I'm bored of waiting											
139	I'm tired/fatigued/exhaus ted from exercising.											
140	I think I shouldn't try more, the tiredness is prevailing											
141	My body trembles like jelly.											
142	My body hurts from exercising											
143	In the end, I got more tired than expected											
144	My body is sore from exercising											
145	I'm dead, the trainer killed me											
146	I can't feel my body											

	in general.											
147	I can't even get up and drive home											
148	I'm feeling dizzy											
149	It is so painful if you want to have a nicebody											
150	My work/job											
151	Issues troubling my family and friends											
152	To pay attention to what I eat and follow a diet											
153	Planning my free time, weekends, and vacations											
154	The country's situation and its future											

Appendix C: Summary of mean ratings and inter-rater agreement

No.	STATEMENTS	MEAN RATING (key construct)	CATEGORIES											
			1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	
1.	Go harder 1	5	5(+1)				1							
2.	More power ! 5	4.8	5(+1)				1							
3.	Give your best! 4	4.6	5(+1)				2							
4.	Keep going on 2	4.4	5(+1)				1							
5.	Super! 6	3.6	4(+2)			2								1
6.	Almost there! 3	3.4	4(+3)			1	1							1
7.	I can do even better 16	3.4	5(+3)			2	1							1
8.	I can take this /I got this 17	3.6	5(+3)	1		2	1							
9.	My body is strong 19	3.2	4(+3)			2		2						1
10.	I can do more , I want more 21	3.8	5(+3)			3	1							1
11.	Relax 10	4.8		5(+2)			1							1
12.	Rest/take a break 12	4.6		5(+1)			1							
13.	Take a breath! 11	4		5(+1)			3							
14.	Let it out 7	3	3	3(+3)			3				1			

15.	I need to be patient 9	3		5(+2)	1	2							
16.	Listen to music and forget the pain 13	2.2	2	2(+2)		3							
17.	Be optimistic 8	1.6	1	3(+5)	1	2	1						1
18.	I feel euphoric/ happy. 29	4.8	1		5(+1)								
19.	I feel more relaxed/ more cheerful/ more euphoric/less stressed) in the end than I what I felt when I started 30	4.8		1	5(+1)								
20.	Well done! /I did great today 25	4.6	2		5(+2)								1
21.	It clears up my mind, I feel calm/peaceful 34	4.6			5(+1)		1						
22.	Exercise changes my mood, making it more positive 35	4.6			5(+1)		2						
23.	I feel great/well/good/pleasant 28	4.4	1		5(+1)								
24.	Stress/worries/negative thoughts are thrown away 31	4.4			5								
25.	Fatigue and exhaustion, but at the same time feeling alive and full of positive energy 54	4.2			5(+2)					2			1
26.	I'll feel beautiful after the workout is done 32	4	1		4(+2)		1						
27.	I feel like flying out of joy and wellbeing! 38	4			4(+1)		1						
28.	I feel a nice tiredness 48	4			5(+1)		1						
29.	I liked it although it was tough today.It was tiring but effective. 52	4			5(+3)		1			1			1
30.	I did it! 23	3.8	3		4(+2)								1
31.	I have achieved my goal until now 15	3.6			4(+1)		1						
32.	I'll feel better when I finish working out 37	3.6			4(+1)		1						
33.	Feeling powerful! 20	3.4	4		3(+2)								1

34.	Feeling satisfied for completing the workout. 40	3.4			4(+1)		1						
35.	Today's workout is great 50	3.4	1		4(+2)		1						
36.	I 'm glad I exercised although I'm bored or tired. 53	3.4			4(+3)				1	1			1
37.	I'm trying although I'm fat 18	3.2	2		3(+3)		1		1				
38.	I'm glad that I'm exercising 45	3.2			4(+1)		2						
39.	I'm happy that my lower back doesn't hurt at all! 51	3.2			4(+1)		2						
40.	It's worth the effort and time 27	3	1		4(+2)		1						
41.	Exercise gives me energy for the rest of the day 33	3			3(+2)		2						
42.	Focus on the technique / Maintain this form / correct your posture 58	5				5							
43.	Focus on the intensity 61	5				5							
44.	Remember to drink water more often. 59	4.8				5							
45.	Pay attention to the length of the break(between exercises) 60	4.8				5							
46.	Focus, to breathe right, so that the exercise is easier. 56	4.6	1		1	5(+2)							
47.	Try to increase the repetitions for abs.57	4.6	1			4(+1)							
48.	Again, from the top/beginning of the set! 63	4.4	2			4(+1)							
49.	Focus on the efficiency 64	3.8	1			5(+1)							
50.	Let's go for another one! 62	3.4	4			4(+1)							
51.	I'm expecting my physical appearance (body) to be better with training 66	4.6					5(+1)						2
52.	I feel that I'm improving my physical condition and that I'm trying 73	4.4					5						

53.	It's giving me energy and health 77	4.4			2		5(+1)						
54.	I'm doing something for myself and my body 76	4			1		5(+2)						1
55.	I will be in shape. 65	3.8	1				4(+1)						3
56.	I really want to be fit with a flat belly 67	3.8					4(+1)						3
57.	I'll have an incredible body for the summer. 68	3.8					4(+1)						3
58.	I want my body to become better 69	3.8					4(+1)						3
59.	I want to be thin 70	3.8					4(+1)						3
60.	I'm going to make(build) a great body. 71	3.8					4(+1)						3
61.	The workout just brings me closer to the body of my dreams. 72	3.8					4(+1)						2
62.	I will burn fat. 75	3.8					4(+1)						2
63.	I want to improve aspects of my physical fitness (strength/stamina/endurance) 79	3.8					4(+1)						1
64.	Exercise is good for me 81	3.6			1		5(+1)						
65.	My heart rate will improve 74	3.4					4(+1)						2
66.	I'm giving to myself 82	3			1		4(+2)						1
67.	Feeling like I've already lost some weight already 42	3			2		4(+1)						
68.	I want to have a good workout today. 83		3		1								3(+2)
69.	Looking forward to next time 84						1						4(+1)
70.	I don't feel too tired,yet. 85		2		2					2			0(+3)
71.	I'm tired, but I'm going to try making the first 30 minutes. 86		3		1					3			2(+3)
72.	I'm not in the mood, but I'll try 87		2		1					3			2(+3)

73.	The aerobics part makes me feel bored after a bit, but it's good for me. 88		1				1			3			2(+2)
74.	Some exercise is better than nothing 89						1			2			3(+2)
75.	I'm going to have a relaxing bath once it's over 90			1							1	3	1(+3)
76.	I should be training longer. 91					1			1	1			2(+3)
77.	I can feel the muscle tension 92		1		2						4		0(+3)
78.	First sweating and then relaxing with a hot shower. 93			1							2	1	3(+3)
79.	I look forward to taking a bath and relaxing.. 94			1							1	3	1(+3)
80.	I will try to come to the gym more frequently. 95								1			1	3(+2)
81.	I believe next time it won't be that painful. 96								1			1	3(+2)
82.	Tomorrow I'll be feeling sore, but that means I worked out . 97		1		1							1	3(+3)
83.	I'm concerned about injuries while exercising 105	4.8							5				
84.	I'm concerned how the pain will go away 106	4.4							5				
85.	I'm afraid what the trainer will tell me about the extra weight when I come next time! 100	4.2							5				
86.	How am I going to make it through the workout? 98	4							5				
87.	I don't have the time to exercise 99	3.8							5				
88.	How tired will I feel? 103	3.4							5(+1)			1	
89.	I hope I don't get tired quickly 104	3.4							5(+1)			1	
90.	When will the exercise program start seeming easy to me? 101	3.2							4(+1)	1			
91.	Oh, I wish I could see a change in my body 102	3							4(+1)	1			
92.	I'm getting worse 112	4.8								5			
93.	My stamina is not good 108	4.6								5			

94.	I'm working out in a sloppy way. 110	4.6						5				
95.	My thighs look fat when I lay down. 115	4.6					1	5(+1)				
96.	I can't run 107	4.4						5				
97.	I'm ashamed that I'm Breathless, feeling tired and grossly sweaty 116	4.4						5(+1)				1
98.	I've gained extra weight 111	4.2						5				
99.	Disappointed, because my lower back bothered me 117	4.2						5				
100.	I won't become better. 109	4					1	4(+1)				
101.	I'm not exercising enough! 113	3.2					2	3(+1)				
102.	I get tired too easily. 114	3						3(+2)		2		1
103.	Losing weight isn't easy at all 118	3					2	4(+1)				
104.	Exercise is boring 136	4.8							5			
105.	I'm bored of waiting 138	4.8							5			
106.	Naa.. I'll stop. 125	4.6							5(+1)	1		
107.	I'm giving up 128	4.6							5			
108.	I can't stand 1 hour of training 131	4.6							5(+1)	1		
109.	I can't continue! 124	4.4						1	4(+2)	1		
110.	Maybe I'll give up halfway 126	4.4							5(+1)	1		
111.	I want to leave to make it in time for my errands 132	4.4							5			
112.	I should have avoided working out 133	4.4							5			

113.	I just want to finish 127	4.2								5			
114.	When will it end?! 5o minutes left 129	4								5			
115.	Perhaps I shouldn't come tomorrow (to the gym) 134	4						1		5(+1)			
116.	I feel dull on seeing the exercises that are difficult 137	3.4						2		4(+2)	1		
117.	I just want to go home and relax 135	3.2								4(+1)	1		
118.	I find this pointless 130	3						3		3(+1)			
119.	I'm tired/fatigued/exhausted from exercising. 139	4.8									5		
120.	I think I shouldn't try more, the tiredness is prevailing 140	4.8									5		
121.	My body hurts from exercising 142	4.8									5		
122.	My body is sore from exercising 144	4.8									5		
123.	I'm dead, the trainer killed me 145	4.8									5		
124.	I can't even get up and drive home 147	4.8									5		
125.	I'm feeling dizzy 148	4.8									5		
126.	I can't feel my body in general. 146	4.6									5		
127.	In the end, I got more tired than expected 143	4.4									5		
128.	It is so painful if you want to have a nice body 149	4.4							2		5(+1)		
129.	My body trembles like jelly. 141	4							1		4(+1)		
130.	My work/job 150	4.8										5	
131.	Issues troubling my family and friends 151	4.8										5	
132.	Planning my free time, weekends, and vacations 153	4.8										5	

133.	The country's situation and its future 154	4.8											5	
134.	To pay attention to what I eat and follow a diet 152	3.8											5	

Notes: Numbers against the statements denote the original number given to the statement for analysis. Statements have been rearranged in a descending order according to the mean rating. In the columns for the key categories (shaded) that an item belongs to, the number outside the bracket denotes the number of raters who matched the item to this category, while the number inside the bracket with the + sign denotes the number of other categories this item watch matched to. The other categories that these items have been matched to (non-shaded) are indicated as well by the number of judges who matched them there. Items 68 – 82 did not fit any pre-defined category, and hence, do not have any mean rating. These items were subsequently categorized as 'Motivation' as suggested by the judges.