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## Imagery

- a way to lower your public speaking anxiety

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## Acknowledgements

To stand alone in front of an audience and perform in one way or another is one of the worst things that I can experience in every day life. I truly hate it, and consequently avoid it the best I can (at least that is what I felt and did before I started writing this master thesis). On the other hand, I have great passion for training, competing and sport psychology. I truly love it, and it makes me feel alive and well. Actually, it was these two opposites that inspired me to write this master thesis concerning imagery and public speaking anxiety, and I have not regretted it for even a second.

I have to admit that, to devote a whole school year to writing a master thesis did sound a bit overwhelming in the beginning, but it turned out to be absolutely amazing. To only have focus on what you are academically most interested in for such a long period has been a true privilege. However, naturally, the motivation and work effort have fluctuated throughout the process. When peaking, my devotion has actually been so intense that I have caught myself “forgetting” to breath. Regarding the other end of the scale, I have decided that it is best not to say what thoughts and actions that have taken place.

The last couple of weeks I have metaphorically felt like I have been a blacksmith striving to forge the perfect sword. Whether I have achieved this goal or not is still unknown, but what I do know, is that I am both pleased and proud of the final result. However, without help, this master thesis would never have become what it is today, and therefore there are several people that deserve thanks. First, I want to thank all of the participants (for their participation). I would also like to thank Anne Marte Pensgaard (supervisor), the NIH library staff (general help), Egil Johansen and Line Støen (“Polar measures”), Marius Dammyr (SPSS), Espen Hegde and Harald Sundgot Borgen (interview guidance), Lasse Harald Nettum (recording of the manuscript), my fiancé and family (general support) and last but not least I would like to thank my peers in “Master office 2A” (discussions, social surroundings and friendship).

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Fredrik Bergseteren

## **Abstract**

*Objectives:* To investigate the effect of a “positive imagery manuscript based on the PETTLEP model”, on the degree of public speaking anxiety (PSA).

*Method:* 6 NIH students ( $M_{\text{age}} = 23,33$ ;  $SD = 2,25$ , 3 male and 3 female) with a certain degree of PSA were purposively recruited and divided into a intervention and a control group. To determine whether the imagery manuscript worked or not, immediate anxiety measures scale measures, heart rate measures, observations, post intervention controls and semi-structured interviews were conducted and finally analysed.

*Results:* When compared with the control group, the intervention group’s heart rate and IAMS results had a pronounced more positive development from pre- to post-test. Furthermore, the observations indicated a better improvement in the intervention group opposed to the control group, and the interview results were consistent with the HR and IAMS results.

*Conclusions:* The findings support the hypotheses and suggests that the imagery manuscript reduced the intervention-participants’ PSA. However, as the interviews revealed, we can not conclude that the manuscript alone led to the results.

*Keywords:* Imagery; PETTLEP model; Public speaking anxiety.

# Content

<b>Acknowledgements</b> .....	<b>3</b>
<b>Abstract</b> .....	<b>4</b>
<b>Content</b> .....	<b>5</b>
<b>1. Introduction</b> .....	<b>7</b>
<b>1.1 Imagery</b> .....	<b>7</b>
1.1.1 Theories .....	9
1.1.2 Applied models of imagery.....	11
<b>1.2 Arousal, activation, stress and anxiety</b> .....	<b>13</b>
1.2.1 Research toward public speaking anxiety.....	15
<b>1.3 Aims and hypotheses</b> .....	<b>18</b>
<b>2. Method</b> .....	<b>19</b>
<b>2.1 Design</b> .....	<b>19</b>
2.1.1 Randomization .....	21
2.1.2 Participants.....	21
2.1.3 Instruments and apparatuses .....	21
<b>2.2 Pilot testing</b> .....	<b>25</b>
<b>2.3 The intervention</b> .....	<b>25</b>
<b>2.4 Test situation</b> .....	<b>27</b>
<b>2.5 Procedures</b> .....	<b>28</b>
2.5.1 Session 1 .....	28
2.5.2 Session 2 – the pre-test .....	29
2.5.3 Session 3 – the post-test.....	29
<b>3. Results</b> .....	<b>30</b>
<b>3.1 Part 1: Quantitative results</b> .....	<b>30</b>
3.1.1 Manipulation check - test situation.....	31
3.1.2 Control of intervention.....	31
3.1.3 Average HR .....	32
3.1.4 Immediate Anxiety Measures Scale .....	32
3.1.5 Sport Imagery Evaluation – intervention group .....	33
3.1.6 Presentation of specific cases .....	34

<b>3.2 Part 2: Qualitative results .....</b>	<b>36</b>
3.2.1 The logbooks (Appendix I).....	36
3.2.2 The observations (Appendix D).....	38
3.3.3 The interviews (Appendix G & H) .....	40
<b>4. Discussion .....</b>	<b>45</b>
<b>4.1 Method .....</b>	<b>45</b>
<b>4.2 Hypothesis 1: Decrease in measured HR.....</b>	<b>47</b>
<b>4.3 Hypothesis 2: Positive development in the IAMS .....</b>	<b>48</b>
<b>4.4 Hypothesis 3: HR and IAMS results compared with the SIE-test, observations, logs and interviews.....</b>	<b>50</b>
4.4.1 Sport Imagery Evaluation – intervention group .....	50
4.4.2 The observations .....	51
4.4.3 The logbooks.....	52
4.4.4 The interviews.....	53
<b>4.5 Presentation of specific cases .....</b>	<b>54</b>
<b>4.6 Ethical considerations.....</b>	<b>55</b>
<b>5. Limitations .....</b>	<b>57</b>
<b>6. Implications.....</b>	<b>59</b>
<b>7. Future research.....</b>	<b>60</b>
<b>8. Conclusion.....</b>	<b>61</b>
<b>References .....</b>	<b>62</b>
<b>List of tables .....</b>	<b>72</b>
<b>List of figures .....</b>	<b>73</b>
<b>Abbreviations.....</b>	<b>74</b>
<b>Appendix .....</b>	<b>75</b>

# 1. Introduction

## 1.1 Imagery

With a wide area of application as well as proven effectiveness, imagery has become one of the most used mental skills we have today. It can help individuals attain faster recovery from injuries, lower anxiety and enhance performance in sports and academics to name a few application areas (Berger, Pargman & Weinberg, 2002). Many definitions of imagery have been produced, and one of the more acknowledged ones was developed by Alan Richardson already in 1969 which stated that:

*Mental imagery refers to (1) all those quasi-sensory and quasi-perceptual experiences of which (2) we are self-consciously aware and which (3) exists for us in the absence of those stimulus conditions that are known to produce their genuine sensory or perceptual counterparts, and which (4) may be expected to have different consequences from their sensory or perceptual counterparts (Richardson, 1969, p. 2).*

Richardson's definition is thorough and to the point, but not especially easy to grasp if you're not fairly familiar with the theoretical component of imagery. Pensgaard's definition on the other hand is more intelligible, and explains imagery as having deliberate control over sensory information occurring in the absence of real stimuli, that is, stimuli that usually would lead to such sensory information (Pensgaard & Hollingen, 2006). In other words; imagining for example jumping on a trampoline may give a lot of the same experiences as when actually jumping on a trampoline. In addition to this, the one practicing imagery has full control over the experiences and can for example in this case imagine jumping higher and doing different tricks. One of the more simplistic definitions is e.g., the one by Vealey and Greenleaf (2006) that explains imagery as a way to re-create or create an experience in the mind by making use of all senses.

Imagery is not to be confused with dreams. For example, if you imagine performing a sky dive, you can feel your heart racing, the adrenalin pumping, the wind smacking your face, your eyes filling with tears, see clouds up close, smell fresh air and hear the wind howling on top of your own screaming. All of these experiences can also be recalled from a dream, but the difference is, when imagining the sky dive you are both conscious and in control of all the experiences, and when dreaming you are neither conscious nor in control of them.

Knowledge and use of imagery is principally attended with the world of sport, but it is also a part of everyday life even though one may not be aware of it. Who can for example say that they never have imagined how a thing may turn out, or never in their mind prepared what to say before making an important phone call? Imagery is not only for athletes like many people might think, as it can be applied as an effective psychological tool by anybody if practised correctly and systematically (Vealey & Greenleaf, 2006).

*Imagine yourself responding more effectively to situations that may have upset you unnecessarily in the past. Imagine yourself in the situation, thinking, focusing, believing, and acting in more constructive ways. Then work on replicating this more positive vision of yourself (or others) in the real world. With persistence, you'll win this one (Orlick, 2000, p. 74).*

There are many reasons why imagery is effective, but the main reason is that it allows the imager to experience positive outcomes over and over again, which increases self-confidence (also known as self-efficacy) (Weinberg & Gould, 2007; Wild, 2009). Self-efficacy says something about a person's confidence in his/her ability to successfully perform a specific task, or achieve a certain goal (e.g., holding a good presentation without being nervous about it) (Bandura, 1997; Vealey & Greenleaf, 2006). Furthermore, increased self-confidence usually results in better focus, which again improves chances of success (Vealey & Greenleaf, 2006). Moreover, Hanton, Mellalieu and Hall (2004, p. 479-480) stated that:

*...high levels of self-confidence are suggested to protect against or override negative interpretations of anxiety responses by facilitating coping resources (e.g., rationalisation of thoughts and feelings) and enabling performers to perceive that they can remain in control in the pressure environment of competition.*

Another important reason indicated by research, is that when performing vivid imagery, the brain display the same response as it would have done if the thing being imagined was actually happening (Marks, 1983). Basically, this means that imagery can be an alternative way to practise and improve a certain task. Furthermore, several different theories have been developed to increase the understanding of imagery.



### **1.1.1 Theories**

Many theories such as the; Symbolic Learning theory, Psychoneuromuscular theory, Bioinformational theory, Dual – Code theory, Functional Equivalence theory, Ahsen’s Triple-Code theory, Attention-Arousal Set theory and Gross Framework or Insight theory to name a few, have been developed to explain why and how imagery works (Morris, Spittle & Watt, 2005; Murphy, Nordin & Cumming, 2008; Pensgaard & Hollingen, 2006; Vealey & Greenleaf, 2006). Two of the mentioned theories are used as frameworks for this thesis.

#### **The Bioinformational Theory**

Through the use of information-processing and psychophysiology, Lang (1977) developed the cognitive bioinformational theory with the goal to increase understanding of phobias and other anxiety disorders (Morris, Spittle & Watt, 2005). Basically, the theory explains imagery as processing of information saved as propositions in the brain. To make this process more comprehensible it can be compared to watching a recorded TV program (e.g., PVR): TV-signals (i.e., perceivable stimuli) go through the air and are picked up by an antenna (i.e., human perception). The signals are then stored in the tuner’s hard disk (i.e., Long Term Memory, brain) as propositions (i.e., information units/memories). At last the propositions get linked and processed by the tuner (i.e., the brain) before displayed as a video on the screen (i.e., imagery) (Morris, Spittle & Watt, 2005). Lang was of the opinion that images consist of two chief propositions called stimulus and response, where the actual content of the scene imagined represent the stimulus propositions (Lang, 1977). For example, an athlete might imagine himself in a 10 000 meter –run, on his last lap in the hot sun. How we react to the content of a scene (i.e., stimulus propositions) represent the response propositions. In this example the athlete might experience shorter strides, shallower breath and heavy perspiration as response propositions to the stimulus propositions (Pensgaard & Hollingen, 2006).

According to Lang (1977), imagery can be a tool toward optimization of performance and learning. He defended this statement by explaining that performance and learning consist of linking suitable stimulus and response propositions, among other factors, and that imagery can make strengthening of these links possible (Morris, Spittle & Watt, 2005). This implies that a higher degree of details included in the imagery, equals better

quality of the imagery (Morris, Spittle & Watt, 2005). To sum up, use of imagery makes it possible to optimize responses to whatever situation, or like Vealey & Greenleaf (2006, p. 318) put it: “Practically, imagery can be explained as a way of enhancing performance by programming personalized and appropriate responses to specific situations, or creating the perfect response set”.

Ever since it got published, many researchers have been interested in the bioinformational theory, and several studies have been conducted, resulting in both support and discussions. Whether imagery scripts and interventions should consist of stimulus and response propositions or just response propositions is probably the most controversial issue which has received most attention. Smith, Holmes, Whitemore, Collins and Devonport (2001) were some of the scientists who took interest in this discussion, and could conclude that imagery training had best effect when there was a combination of stimulus and response propositions.

Whether imagery training is most effective when performed internally or externally is also a discussion that has received a lot of attention. Most studies have supported internal imagery like e.g., Hecker & Kaczor’s (1988) study, which indicated that internal imagery was more effective because it gave the user a first-person perspective. A first-person perspective is argued to be more effective than a third-person perspective because it involves more response propositions (Morris, Spittle & Watt, 2005). However, there are also studies that have found no difference at all. Finally, the lack of consensus within this research area has been explained by poor instructions in imagery manuscripts, non-use of manipulation checks and omission of measured performance changes among other factors (Morris, Spittle & Watt, 2005).

### **The Functional Equivalence Theory**

In search for a more applied and adequate theory than the ones existing, researchers developed the functional equivalence theory (Murphy, Nordin & Cumming, 2008). It is principally based on the symbolic learning theory, the psychoneuromuscular theory and the bioinformational theory (Murphy et al., 2008), in addition to rather recent research in the field of cognitive neuroscience (Moran, 2004). The actual name of the theory, is based on the existing relationship between movement imagery and the preparation and programming of actual movement (Moran, 1996).

According to the functional equivalence theory, imagery activates the same neural network as actual movement does, including activation of memories and emotions (Kosslyn, Ganis & Thompson, 2001). Murphy, Nordin & Cumming (2008) came to this conclusion after measuring and comparing activity in the brain during actual movement and imagined movement, hence the explanation of imagery as a multisensory experience without actual execution and perception. Furthermore, imagery can re-create earlier experiences as well as create new ones by assembling perceptual information already saved in the long term memory in new ways (Kosslyn, Ganis & Thompson, 2001). Consequently, this can be utilized by strengthening and optimizing mental experiences toward any given situation (Pensgaard & Hollingen, 2006).

The actual effect of imagery depends on many determinants, hence the need for applied models to secure best effect possible.

### **1.1.2 Applied models of imagery**

The PETTLEP model, the applied model of imagery use, the sport imagery ability model, the four Ws of sport imagery, the imagery content model and the three-level model of sport imagery are some of the applied models developed till now (Morris, Spittle & Watt, 2005; Munroe, Giacobbi, Hall & Weinberg, 2000; Murphy, Nordin & Cumming, 2008). Some of these are more notorious than others, but one thing they all have in common is the agreement that there are certain guidelines that needs to be followed to make the most of imagery. Because of its popularity and great contribution to the world of sports, the PETTLEP model was chosen for the present study (Murphy, Nordin & Cumming, 2008).

#### **The PETTLEP model**

The acronym PETTLEP which is short for; “physical, environment, task, timing, learning, emotion and perspective”, was developed by Paul Holmes and Davis Collins (2001) as a checklist to be used by sport psychologists in production of imagery interventions and manuscripts. With especially the functional equivalence- and bioinformational theory in mind, they sought to create guidelines that would increase activation of neural networks equal to activation occurring in real situations (Holmes & Collins, 2001; Murphy, Nordin & Cumming, 2008). In other words, the guidelines were

created to make imagery as realistic and effective as possible. A coach imagining holding a press conference will be used as an example when explaining the PETTLEP model's seven guidelines.

***Physical:*** You ought to match the physical activation level of the actual situation when practicing imagery (Holmes & Collins, 2001). In other words, you should be in the same position as you would have had in the actual situation. Because of this, the coach should be in a standing or sitting position during the imagery session.

***Environment:*** You ought to comprise as many stimulus and response propositions as possible from the environment when practicing imagery (Holmes & Collins, 2001). This includes experiences like tastes, visual details, smells, physical feelings, sounds, temperatures and so on (Murphy, Nordin & Cumming, 2008). This taken into consideration, the coach may e.g., see an auditorium filled with people, feel cards in his hands, smell perfume, taste coffee and hear people talking.

***Task:*** You ought to make the task imagined as similar to the nature of the actual task as possible (Holmes & Collins, 2001; Murphy, Nordin & Cumming, 2008). The coach could in this case benefit from concentrating on e.g., body language, voice characteristics, thoughts and surroundings.

***Timing:*** You ought to practise imagery in the same speed as the task has in reality (Holmes & Collins, 2001; Murphy, Nordin & Cumming, 2008). The coach should in this case imagine his press conference in normal speed.

***Learning:*** Practice and learning toward imagery results in progress and because of this, imagery manuscripts ought to be updated at regular intervals to maintain effectiveness (Holmes & Collins, 2001; Murphy, Nordin & Cumming, 2008).

***Emotion:*** You should focus on desired positive feelings toward the task imagined. Focusing on these feelings can improve performance by strengthening memory representations (Holmes & Collins, 2001; Murphy, Nordin & Cumming, 2008). The coach could in this case focus on feeling calm, excited, happy and self-confident.

**Perspective:** In most cases you ought to have an internal perspective when practicing imagery (Murphy, Nordin & Cumming, 2008). There are only a few cases where inclusion of external imagery (i.e., similar to watching yourself on a video-clip) or choosing external imagery alone is considered more beneficial (Morris, Spittle & Watt, 2005). The coach should in this case “see” through his own eyes when practicing imagery.

With the theoretical frameworks in place, we’ll continue with an overview and elaboration of the main constructs toward this study.

## **1.2 Arousal, activation, stress and anxiety**

Arousal, activation, stress and anxiety are four constructs that has caused confusion for many readers and researchers. The reason for this, is the lack of consistency regarding the definition and use of them (Cattell, 1966).

Arousal says something about an individual’s combination of psychological and physiological activation as a response to stimuli (Hardy, Jones & Gould, 1996; Pribram & McGuinness, 1975). It is basically the body’s reaction to a situation, and the intensity varies on a continuum ranging from not aroused at all (e.g., deep sleep) to extremely aroused (e.g., just won the Olympic Games 100m) (Weinberg & Gould, 2007). We can get equally aroused by something negative as something positive, like for instance a football player who is about to execute a penalty kick in front of thousands of people might be highly aroused. That is, he or she could e.g., be very nervous, which could lead to trembling, increased heart rate, sweating, butterflies in the stomach and negative thoughts.

Activation says something about the individual’s readiness (i.e., state) to respond to a certain situation (i.e., stimuli) (Hardy, Jones & Gould, 1996; Pribram & McGuinness, 1975). For example, an individual is not especially ready to respond to stimuli when sleeping (i.e., low arousal), or opposite: an individual who is about to enter a boxing ring would hopefully be very ready (i.e., high arousal) to respond to his opponent. We can say that activation is more or less intended preparation of the body to respond to anticipated stimuli. Consequently, anxiety is a special case of activation since it does

not represent the same activation as for example when being very happy. Furthermore, you can have high arousal, and yet different activation depending on what is causing the high arousal (i.e., the situation). It is the type of stimuli (situation, e.g., positive/negative) that determines the type of activation (i.e., the state), rather than the level of activation (Hardy, Jones & Gould, 1996).

Stress is not the same as anxiety although they are both concepts that have been used interchangeably (Abrahamsen, 2007). Stress can be experienced when you are in a situation that requires higher abilities than you feel like you possess (Pensgaard & Hollingen, 2006). For example, you experience stress before holding a speech in front of a huge audience because you are not sure that you are a good enough presenter to redeem the audience's expectations. The consequence of the perceived stress in this situation can subjectively be experienced as anxiety, where anxiety is a form of negative stress emotion (Lazarus, 1999), which again is a type of stress response (Spielberger, 1966). The relation between anxiety and stress have been illustrated in McGrath's stress model as a process (McGrath, 1982), where stress is defined as: "a substantial imbalance between demand and response capability, under conditions where failure to meet demand has important (perceived) consequences" (McGrath, 1970, p. 20). What people consider as important consequences is of course highly individual (Pensgaard & Hollingen, 2006).

The process starts with a situation (A), e.g., a mountain climber who is about to take a complicated route. The mountain climber perceives the situation as stressful because if he fails to manage it, it will have an undesirable effect (B). The climber will now decide how to deal with his stressful situation the best way possible. The climber's decision will affect his arousal and activation (C), which again will result in an observable behavior (D). The behavior will be registered and analyzed by the climber, and brought into the climber's next situation, thus influencing his next appraisal process (Abrahamsen, 2007). By looking at this process we can see that stress is a personal experience of a situation (e.g., anxiety).

Anxiety then may be defined as: “a negatively charged emotional state characterized by internal discomfort and nervousness” (LeUnes & Nation, 2002, p.72). It is also multidimensional, thus divided into **state** and **trait** anxiety, where state anxiety is a form of situational apprehension (LeUnes & Nation, 2002). Spielberger (1966) defined state anxiety as “subjective, consciously perceived feelings of apprehension and tension, accompanied by or associated with activation or arousal of the autonomic nervous system” (Spielberger, 1966, p. 17). In other words, e.g., an elite athlete who is about to have a presentation in front of a large crowd of supporters and reporters, feels worried and shows signs of nervousness (e.g., sweating, trembling, stuttering). In this example, the state (i.e., holding a presentation) affected the elite athlete in a negative way (i.e., anxiety).

We also distinguish between **cognitive** and **somatic** state anxiety (LeUnes & Nation, 2002). Somatic state anxiety (Witt, Brown, Roberts, Weisel, Sawyer & Behnke, 2006) is the perceived body sensations (e.g., butterflies in the stomach, increased heart rate, increase in perspiration) that are associated with a specific situation, whereas cognitive state anxiety concerns negative thoughts (e.g., worry, emotional distress) and problems with keeping concentration (LeUnes & Nation, 2002). Trait anxiety on the other hand, is a more nonspecific kind of anxiety connected to personality (Weinberg & Gould, 2007). Individuals with trait anxiety generally feel nervous or threatened by a number of different life situations (even to situations that most people never could see as threatening) (LeUnes & Nation, 2002).

We now have a better understanding of the main constructs of the present study, and will continue with a brief look at some of the research that has been conducted on the different areas.

### **1.2.1 Research toward public speaking anxiety.**

There are many state anxiety areas but the present study will focus on the area known as **social phobia** (also known as social anxiety) or more specifically **public speaking anxiety (PSA)** (also known as speech anxiety) (Greco & Morris, 2005). Social phobia, according to the American Psychiatric Association, involves “A marked and persistent fear of one or more social or performance situations in which the person is exposed to

unfamiliar people or to possible scrutiny by others” (American Psychiatric Association, 1994, p. 416). Social phobia can also be labelled as *generalized* if the person finds most social situations fearful, and to get diagnosed with social phobia, symptoms are required to be experienced as debilitating or impairing (Blöte, Kint, Miers & Westenberg, 2009). The present study however seeks to help individuals struggling with PSA independent of whether they can be diagnosed with social phobia or not. In this case, the sample from NIH was perfect since all of them at a later point most likely would get into public speaking situations toward their later career choice (e.g., instructors, PT’s, coaches, physical education teachers, advisors).

Principally, research conducted on social phobia so far has focused on cognitive-behavioral treatment on both individuals and groups (Overholser, 2002). The therapy has basically consisted of four general components (Overholser, 2002): 1) Establishing a good relation between therapist and client, and education about anxiety. 2) Development of social skills. 3) Exposure to social situations. 4) Relapse prevention. Other forms of cognitive behavioral treatment like audio and video feedback, imagery rescripting, surveys of other people’s observations, and behavioural experiments, have also been used (Clark & Wells, 1995; Clark, Ehlers, McManus, Hackmann, Fennell, Campbell, Flower, Davenport & Louis, 2003; Heimberg & Becker, 2002).

Supporting earlier research, Vassilopoulos’ study (2005) suggested that negative self-imagery in high socially anxious individuals increased body sensations, such as heart rate, trembling, sweating and so on. It also suggested that many individuals with social phobia such as PSA, often performs negative self-imagery without being aware of it, thus maintaining their social phobia. Vassilopoulos (2005) as well as Hu, Bostow, Lipman, Bell & Klein (1992), found that switching negative self-imagery with positive self-imagery gave good results in people with social phobia. It resulted in less negative experiences for the participants when in social interaction, as well as supporting the notion that, self-imagery can affect anxiety and self-perception of people with social phobia (Vassilopoulos, 2005).

It is no secret that imagery has been used much in the world of sport. In fact, the use of imagery has actually been so successful that it has become a part of the U.S. Olympic athletes training routine, which says a lot (Suinn, 1996). Research on imagery toward



anxiety in sport is therefore quite interesting, and so far they have found that imagery can lower anxiety (e.g., competitive anxiety) symptoms as well as change the perception (also known as direction) of them to be more facilitative (i.e., positive/helpful) rather than debilitating (i.e., negative/harmful) (Fletcher & Hanton, 2001; Hanton & Jones, 1999; Hanton, Mellalieu & Hall, 2004; Kerr & Leith, 1993; Murphy, Nordin & Cumming, 2008; Orlick, 2000; Page, Sime & Nordell, 1999; Vadocz, Hall & Moritz, 1997; Vealey & Greenleaf, 2006). Furthermore, imagery's anxiolytic effect has received strongest support from studies where they have combined imagery with other cognitive behavioral strategies such as stress inoculation training (SIT) and combination of imagery and relaxation training (Cogan and Petrie, 1995; Martin, Moritz & Hall, 1999; Meichenbaum, 1985; Savoy, 1993; Suinn, 1996). This is very interesting considering that this study will use imagery as the only strategy.

*In general, PSA (e.g., when holding a speech) is the most common, if not the only social fear people report whether they are diagnosed with social phobia or not (Furmark, Tillfors, Stattin, Ekselius & Fredrikson, 2000; Pollard & Henderson, 1988; Stein, Walker & Forde, 1994, 1996; Turner & Beidel, 1989).*

*Some people experience a high degree of anxiety when talking in front of a small group of friends (Stein, Walker & Forde, 1994).*

*“Social anxiety is a relatively common phenomenon...” (Davidson, Hughes, George & Blazer, 1994, p. 975).*

*“Today, social phobia is the third most common psychiatric disorder that, left untreated, has been shown to have a marked impact upon the quality of life and success of sufferers” (Jefferys, 1997, p. 1061).*

*“Public speaking anxiety is a serious concern for many communicators, in part because it generates uncomfortable physiological responses that can distract or interrupt the speaker's typical communicative behavior” (Witt, Brown, Roberts, Weisel, Sawyer & Behnke, 2006, p. 91).*

The list could probably go on forever, and clearly illustrate that there is a general lack of support for individuals with PSA. Consequently, it is important that everybody with PSA has access to an effective and easy to learn method that can help them without having to see a therapist, psychologist or pay for a course. If we for example take a high profiled coach with PSA, when looking at research toward imagery, there is little doubt about what an effective imagery manuscript could do for this coach when e.g., holding press conferences.

### ***1.3 Aims and hypotheses***

Based on what has been presented so far, the aim of the present study is to investigate the effect of a “positive imagery manuscript based on the PETTLEP model”, on the degree of PSA. Furthermore, the imagery manuscript is hypothesized to change the response propositions to the stimulus in a public speaking setting from maladaptive to adaptive.

#### **The research question:**

Will a positive imagery manuscript based on the PETTLEP model reduce public speaking anxiety?

#### **Hypotheses:**

- 1) The intervention group has a pronounced greater decrease in measured HR from pre- to post-test opposed to the control group.
- 2) The intervention group has a pronounced more positive development in the IAMS results from pre- to post-test opposed to the control group.
- 3) The HR and IAMS results are consistent with the SIE-test, observations, logs and interviews.

## **2. Method**

This was an evaluative case study with an experimental design, which sought to investigate how an independent variable would affect a dependent variable. More specifically the goal was to: “investigate the effects of a positive imagery manuscript on the degree of PSA”. To prove this causality there was not just need of solid statistics and a good design but also logic such as (Black, 1999; Thomas, Nelson & Silverman, 2005):

1. Cause has to occur before effect in time, and there has to be a change or improvement between the pre- and post-test.
2. Agreement: An effect occurs when X and Y are together and they only have Z in common. This implies that Z is the cause of X and Y's effect.
3. Disagreement: A and B only have Z in common, but Z is absent. Thus the effect is not occurring in A and B. This implies that Z is the cause of the non effect.
4. There can not be cause and effect between variables without correlation and correlation does not cause something to happen.

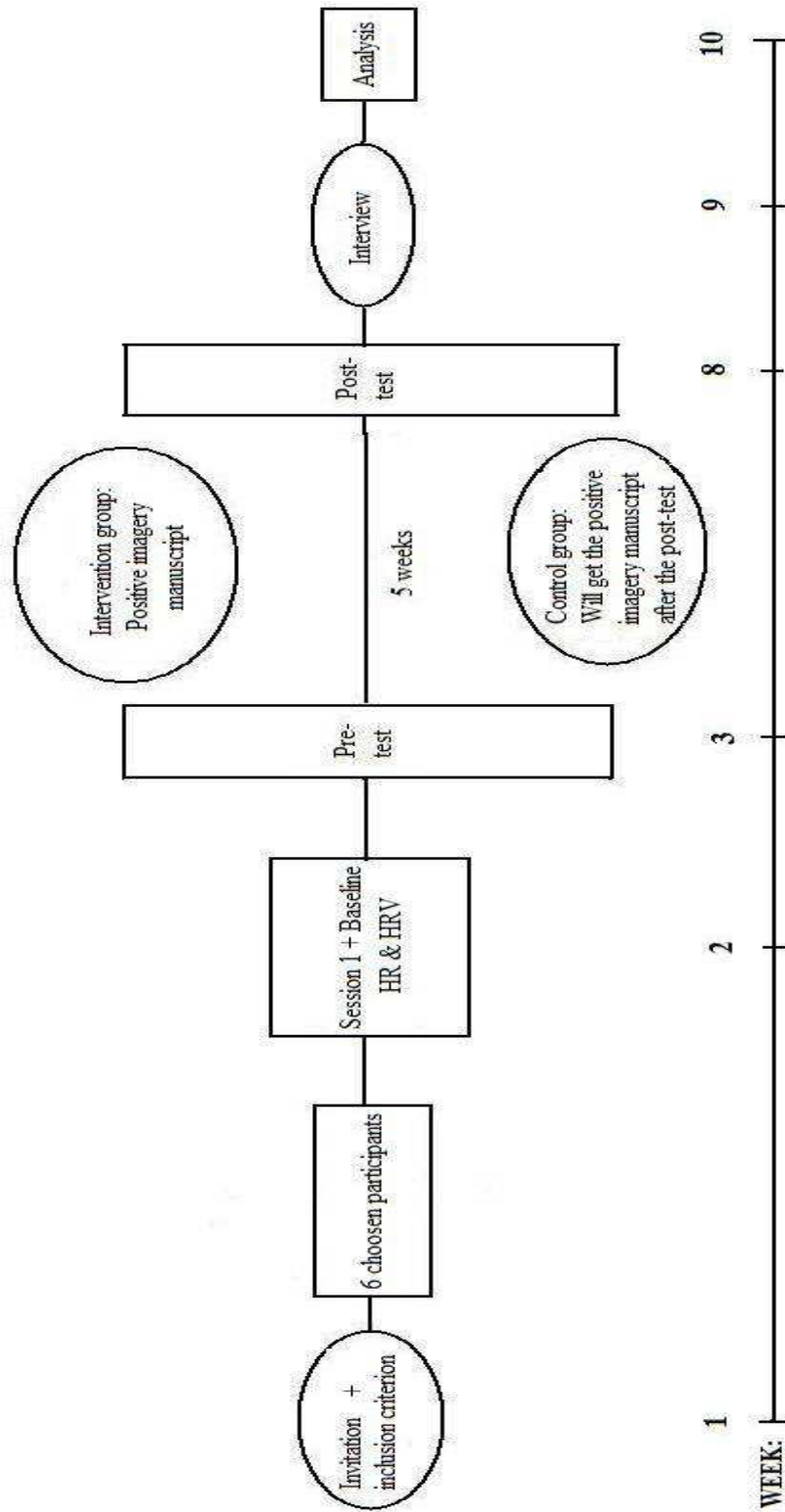
### **2.1 Design**

The type of experiment applied in the present study has what we call a “Quasi-experimental design” also known as a “Pre test-Post test Randomized-Groups Design” (Thomas, Nelson & Silverman, 2005). This design is developed to display the degree of change produced by a treatment, which in this case is a change in the degree of PSA. Threats to internal validity are controlled for by the comparison between O1 to O2 and O3 to O4. In addition to this, a design like this will also control both anticipated and unanticipated variables, by randomly assigning the participants into groups. This way, any extraneous variables will be equally distributed over the groups, thus posing the same effect on all participants, consequently strengthening the study's internal validity even more (Thomas, Nelson & Silverman, 2005). Finally, generalizability of the results is limited because of the purposive sampling technique used, and also due to the small sample size (Black, 1999).

R O1 T O2

R O3 C O4

(R = randomized groups; T = imagery manuscript; C = control; O = observation).



*Figure 1.1: An overview of the study.*

### **2.1.1 Randomization**

Six ID's ranging from 00 to 05 was randomly written down in a table. Next, the table was divided in two, where number 00, 01 and 02 became the intervention group. Each participant was then given a numeric ID through drawing lots. This procedure ensured that the participants in the sample were randomly assigned into the two groups (Thomas, Nelson & Silverman, 2005).

### **2.1.2 Participants**

The sample participating in this study consisted of students from the Norwegian School of Sport Sciences (NIH), and having a certain degree of PSA was the inclusion criterion to participate. The participants were purposively recruited through a letter of inquiry (Appendix B) which was sent with e-mail to every student at NIH (Black, 1999). This resulted in six (three females and three males) suitable participants with age ranging between 20 and 25 ( $M_{\text{age}} = 23,33$ ;  $SD = 2,25$ ) participating. Furthermore, all participants considered themselves as being in good or very good shape. None of the participants used any kind of tobacco, suffered from any sickness or disease, nor did any of them take any medicine that could affect the Polar recordings.

### **2.1.3 Instruments and apparatuses**

The Immediate Anxiety Measures Scale (IAMS) was used as a self-report measure to be filled out within the last 10 minutes before each presentation (Thomas, Hanton & Jones, 2002). The scale was translated to Norwegian and adjusted to suit the participants and testing conditions (Appendix C). The IAMS consists of three items measuring direction, frequency and degree of somatic anxiety, cognitive anxiety and self-confidence. In the questionnaire the participants were instructed to rate the direction and degree for each of the three items on a 7-point Likert-type scale (Thomas, Nelson & Silverman, 2005). The direction varied from +3 (i.e., very positive/facilitative) to -3 (i.e., very negative/debilitative), the frequency varied from 7 (i.e., all the time) to 1 (i.e., never), whereas the degree varied from 7 (i.e., extremely) to 1 (i.e., not at all). Finally, a very important part of the IAMS is the enclosed written information which helps the participants identify and understand their anxiety reactions. It includes different examples of

cognitive and somatic anxiety as well as definitions and explanations of the different terms used in the questionnaire (Thomas, Hanton & Jones, 2002).

Heart rate (HR) is often used as measurement on the degree of anxiety, where higher HR usually equals a higher degree of anxiety (Hardy, 1996; Hu, Bostow, Lipman, Bell & Klein, 1992; LeUnes & Nation, 2002; Morris, Spittle & Watt, 2005; Witt, Brown, Roberts, Weisel, Sawyer & Behnke, 2006). In this study, the decision fell on using Polar RS800CX watches and the Polar ProTrainer 5 software, developed to increase the benefits of heart rate based training (Polar Electro, 2010). 30 second recordings of “POLAR-data” were set as a standard both when establishing baseline and during pre-testing (Hecker & Kaczor, 1988). Due to unstable and varying results in the pre-test, the recordings were expanded to 15 minutes in the post-test (Blásquez, Font & Ortís, 2009), where extraction of 30 second samples from the post-test recordings made it possible to compare the results from both pre- and post-testing. Finally, like the IAMS measures, all recordings of “POLAR-data” were obtained within the last 10 minutes prior to each presentation, and it was a criterion that the participants had to sit still for at least 5 minutes before they started their recordings.

Heart rate variability (HRV) which is measured time between heart beats (also known as RR intervals) were recorded simultaneously with the heart rate (Dishman, Nakamura, Garcia, Thompson, Dunn & Blair, 2000; Polar Electro, 2010). Simply put, HRV gives a picture of the hearts ability to change the interval between beats toward any given situation, and superior to HRV is the autonomous nervous system (ANS) which mainly controls these variations (Sztajzel, 2004). Furthermore, HRV consists of several different parameters and after reading up on HRV as well as having a consultation with a master student who had recently been in Finland on a POLAR seminar, the following were chosen for this study: RMSSD (i.e., Root Mean Square of Differences), SD1 (i.e., Instantaneous beat-to-beat variability), LF (i.e., Low Frequency power which reflects sympathetic components of the ANS), HF (i.e., High Frequency power which reflects parasympathetic components of the ANS), LF/HF % (i.e., LF/HF ratio which reflects changes between LF and HF). Generally, research indicates that individuals with high HRV values such as RMSSD, SD1 and HF have greater self regulation skills and experience lower anxiety levels than people with low HRV values (Blásquez, Font & Ortís, 2009; Bleil, Gianaros, Jennings, Flory & Manuck, 2008; Dishman, Nakamura,

Garcia, Thompson, Dunn & Blair, 2000; Hansen, 2003; Hatayama, Kitamura, Tamura, Nagano & Ohnuki, 2008; Pieper, Brosschot, Leeden & Thayer, 2007; Vanderlei, Pastre, Hoshi, Carvalho, & Godoy, 2009). More precisely, higher value of RMSSD, lower value of LF and LF/HF% (equals lower activation of the sympathetic nervous system), higher HF value (equals higher activation of the parasympathetic nervous system), and higher SD1 value equals a low HR, and together all of these values indicate that an individual has low anxiety levels. Contrary, if the values are reversed they indicate higher anxiety levels in the individual (Blásquez, Font & Ortís, 2009). Finally, it is the baseline recordings which determine whether the values are higher or lower.

Unobtrusive observations were carried out on all 6 participants through a standardized scheme (Appendix D) during both pre- and post-testing (Patton, 1990). More accurately, observations were limited to the actual presentation of each participant, unlike the IAMS and Polar recordings. The scheme consists of 10 different signs that are considered typical signs of behavior when experiencing anxiety (Jefferys, 1997; Leary, 1983; Wild, 2009; Witt, Brown, Roberts, Weisel, Sawyer & Behnke, 2006). The signs worked as guidelines during the observations, resulting in holistic descriptions of each presentation (Marshall & Rossman, 1999; Thomas, Nelson & Silverman, 2005). All the observations were qualitatively analyzed after each test as well as compared to results from the other measurements (Thomas, Nelson & Silverman, 2005). In addition to the first observer (O1), another observer (O2) was included to increase objectivity of the post-test results (Thomas, Nelson & Silverman, 2005).

Post intervention control. Whether the participants responded to the intervention the way intended or not was thrown light on by a post intervention control (Williams, Cumming & Balanos, 2010) consisting of five questions (Appendix E). Each question were to be rated on a 7-point Likert-type scale (Thomas, Nelson & Silverman, 2005). Question nr. 1 assessed the participant's relatedness to the manuscript, and were rated from 1 = very hard to 7 = not at all. Nr. 2 assessed the participant's ease to perform imagery, and were rated from 1 = very hard to 7 = not at all. Nr. 3 assessed the participant's feeling of meaningfulness to the manuscript, and were rated from 1 = not at all meaningful to 7 = very meaningful. Nr. 4 assessed the participant's degree of experienced emotion, and were rated from 1 = very weak to 7 = very strong. Nr. 5

assessed the participant's experienced degree of helpfulness, and were rated from 1 = not helpful at all to 7 = very helpful.

The Sport Imagery Evaluation-test (SIE). The intervention participants' imagery ability was measured with an adapted version of the Sport Imagery Evaluation-test (Appendix F) (Vealey & Greenleaf, 2006; Pensgaard & Hollingen, 1996). The participants had to imagine four different situations and the imagery quality toward each situation were evaluated by rating nine complementary statements (i.e., A-I). Rating scale: 1 = not at all, 2 = fairly, 3 = moderately, 4 = very, 5 = extremely. The scores from each question (i.e., A-I), were judged like this: "Excellent (20-18), Good (17-15), Average (14-12), Fair (11-18) and Poor (7-4)" (Vealey & Greenleaf, 2006, p. 348). The participants filled out the Sport Imagery Evaluation-test again after the intervention.

Log. All participants in the intervention group were instructed to keep a log (Appendix I) toward their imagery sessions. They were told to register things like: *Was it hard to concentrate? How long did it take? How did you feel in the beginning and in the end of the session? How many times did you listen to the soundtrack? Did you manage to visualize the whole manuscript? Was it quiet around you during the session? Did you have any problems?* The logs made it possible to look at the participant's experiences and commitment toward the imagery intervention, as well as detect potential sources that could threaten the study's internal validity.

Semi-structured interviews. Finally, all the participants were separately interviewed on the following days: 8<sup>th</sup>, 9<sup>th</sup>, 10<sup>th</sup> and 11<sup>th</sup> of March 2011. Since they were divided into control and intervention groups there was need for two different interview guides. Both interview guides were semi-structured to make the interviews as natural as possible (i.e., more like real conversations) while at the same time ensuring grasping the same important aspects in each interview (Arksey & Knight, 1999). Choosing the semi structure also made it possible to explore interesting topics or meanings that could emerge during the interviews through follow-up questions (Arksey & Knight, 1999). By interviewing the participants in the intervention group I was hoping to get a better understanding of their PSA situation, to get insight in their experience from participating in the study and to get a closer look at their response to the imagery manuscript (Appendix G). The interviews with the three participants in the control



group were more like a debriefing, but I also hoped for a better understanding of their PSA situation and to get insight in their experience from participating in the project as well (Appendix H). Depending on how much each participant had to say and which group she or he belonged to, the length of each interview varied between 40 to 60 minutes.

## **2.2 Pilot testing**

6 instruments and apparatuses were pilot tested with nine individuals with a certain degree of PSA. Feedback from the pilot testing helped adjust the imagery manuscript, the self-report measure (IAMS), the post intervention control, the Sport Imagery Evaluation-test (SIE) and the interview guides. In addition to these, the Polar RS800CX watches and observation scheme were also tested.

## **2.3 The intervention**

The intervention lasted for 5 weeks as recommended by Smith, Wright, Allsopp & Westhead (2007) and the participants in the intervention group were instructed to rehearse the imagery manuscript (Appendix A) for 6 minutes as recommended by Holmes & Collins (2001) and Twining (1949), every day during that period. The manuscript was given to each of them in both text and audio format (Morris, Spittle & Watt, 2005). The goal for each participant in the intervention group was to eventually get to the point where he/she knew the manuscript by heart, and could just play the script over and over in the mind (Unestahl, 1982).

After reading the manuscript, one can see that it reflects different parts of the sport psychology literature. Fundamentally, we have the Bioinformational theory which was presented earlier, that acknowledges the basics of stimulus and response (Lang, 1977), and we have the PETTLEP model based on the Bioinformational theory, among others, which helps the reader experience more vivid, and thus more effective imagery (Holmes & Collins, 2001). Furthermore, the manuscript concerns other aspects as well.

The imagery manuscript builds self-confidence and self-efficacy by allowing the user to see him/her -self perform the perfect (desired) presentation (Weinberg & Gould, 2007).

The importance of this is also stated by Vealey & Greenleaf (2006, p. 349): “thoughts directly affect feelings and ultimately actions”. In other words; if you think positive, you will feel positive, which consequently will result in positive behavior.

People with PSA are often self-focused (Wild, 2009). Being self-focused is not necessarily a negative thing, but people with PSA usually focus a lot on their negative feelings and thoughts which is not a good thing. Traditionally, speech anxiety treatment seeks to reduce self-focus (Overholser, 2002). The imagery manuscript in this study however, seeks to shift from a negative self-focus to a positive self-focus, which according Lang (1997) and the bioinformational theory is possible by creating the perfect response set.

Exposure has been used as treatment for people with PSA and other phobias (Overholser, 2002). It can be compared to e.g., learning to drive a car, where the first time you try you may feel terrified, but as you do it over and over again you feel more and more confident and less nervous. In other words, the continuous exposure results in the action becoming a habit. Imagery manuscripts like in the present study similarly provide exposure, though not as realistic and powerful as actual exposure.

*Mental imagery gives you a chance to deal effectively with a problem or event in your head before you confront it in real life. If a challenge does arise, you are better able to handle it or cope with it. This is largely because you have already faced the challenge, have practised some means of coping with it, and have overcome it in your mental reality, if not your physical reality. By using mental imagery, you can enter a variety of real situations, including competitions, with feelings like I've been here before. It's no big surprise. There's no reason to panic. I've prepared for this; I can handle it (Orlick, 2000, p.108).*

Usually imagery manuscripts are personalized because a standardized manuscript rarely works well on everybody (Pensgaard & Hollingen, 2006). The imagery manuscript in the present experiment however was standardized, which meant that the results could not be explained by differences in the manuscript itself. When saying standardized it does not mean that all the participants would have the exact same experiences, since experiences are a highly individual thing. The manuscript was only standardized in the way that all participants would receive the exact same manuscript. Since I have PSA, the actual design and story being told in the manuscript were based on my personal experiences as well as responses from the pilot test.

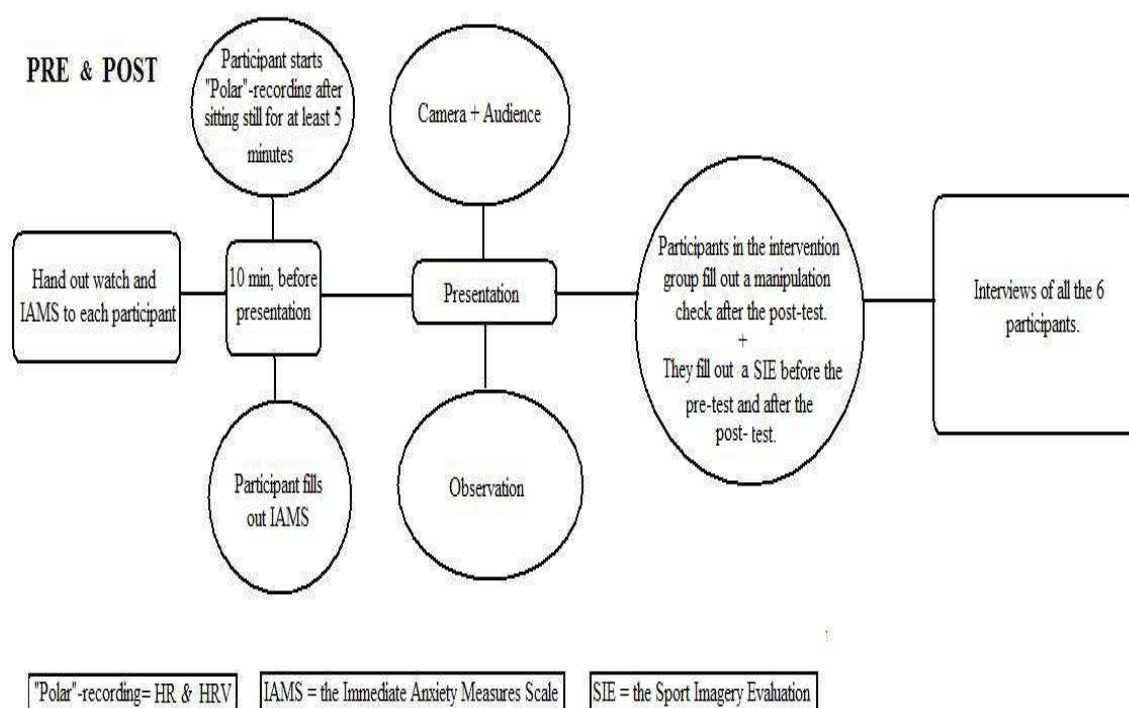
Earlier research has indicated good results with audio based imagery treatment which is why the manuscript finally was recorded and converted into an mp3-file (Morris, Spittle & Watt, 2005).

## **2.4 Test situation**

Inspired by Witt, Brown, Roberts, Weisel, Sawyer and Behnke, (2006), the presentations were held in “Auditorium A” which is located in the Norwegian School of Sport Sciences. To replicate the pressure participants feel when having a real presentation there were an audience consisting of the other participants and invited students and employees at NIH in the auditorium. In addition to this, there was a camera that looked liked it taped the presentations (Vassilopoulos, 2005). The participants were told that the videotape would be analyzed and rated by professional lecturers from NIH later on, as well as being put on the “NIH-intranet” for everybody to watch. Each presentation had a time limit of 10 minutes (Smith, Sawyer & Behnke, 2005; Witt, Brown, Roberts, Weisel, Sawyer & Behnke, 2006), and there was set aside 5 minutes for questions after each presentation. In all, 15 minutes was set aside for each participant.

The participants were randomly given 1 out of 3 different themes to present. The possible themes for their first presentation were: Freeride on skis, Rock climbing and Base jumping. The possible themes for their second presentation were: Track and Field, Soccer and Cross country skiing. By doing it this way, I was hoping to make the participants think about the possibility of comparing themselves to others, which could increase their experienced pressure even more. Their presentations had to be based on a PowerPoint (PPT) presentation that were supposed to be entertaining, containing only facts and without any video clips. They were informed that they could use any library as well as Internet, and that they did not have to list any references.

## 2.5 Procedures



**Figure 1.2:** An overview of the test-procedure.

### 2.5.1 Session 1

On the first meeting with the participants the goal was to acclimatize them to the test area and measurement tools, as well as establishing a baseline for the HR and HRV measures. They were also given the opportunity to ask questions toward the experiment. Information was given about things like: what's expected of the presentation, evaluation, preparation time, time limit, expected duration of testing, themes, testing area and so on. Furthermore, they were told to check their mail regularly in the future. Three of the participants did not have the opportunity to show up for this meeting. I met two of these participants separately at different places during the same day to make it work for them. The last participant had to get information by e-mail. All of these three participants had been in "Auditorium A" lots of times before. The three participants that showed up this day were the ones in the intervention group. I had randomly divided the participants into two groups (Intervention and Control) the day before the meeting. The intervention group got information about imagery in general and about how to use the imagery manuscript in the best way possible. In addition to this, they had to fill out a

Sport Imagery Evaluation-test (Appendix F). The control group were told that they were to try the method at a later point.

### **2.5.2 Session 2 – the pre-test**

On the second meeting the participants came prepared to hold their first presentations. As planned, during the last 10 minutes prior to their presentations, they filled out the IAMS and made a 30 second recording with a Polar watch.

With help of the standardized observation scheme I unobtrusively observed and evaluated each participant during their presentation. If a participant repeatedly displayed a sign, it was marked and commented. For example, if a participant repeatedly said “eeeh”, I marked the “eeeh-field” in the scheme. I then commented that the participant said “eeeh” a lot. Finally, around 17 people showed up to watch the presentations this day.

### **2.5.3 Session 3 – the post-test**

On the third meeting the participants came prepared to hold their second presentation. As planned, during the last 10 minutes prior to their presentations, they filled out the IAMS and started a 15 minute recording with a Polar watch.

This time the intervention group was also expected to have been through the “imagery manuscript intervention” of 5 weeks. Furthermore, they had to fill out a post intervention control (Appendix E) as well as another SIE-test (Appendix F) after their presentations. Another observer and I unobtrusively observed and evaluated each participant this time also.

At the end of the day, time and place for the interviews were appointed with each participant. During the actual interviews, all the participants were thanked for their help as well as debriefed about the study, which implied telling them about why they were deceived and expected results, among other things (Cozby, 1993). Finally, the control group was offered the same intervention as the intervention group had received. Around 9 people showed up to watch the presentations this day.

### 3. Results

#### 3.1 Part 1: Quantitative results

Having a small sample is not beneficial when it comes to statistics, and after running paired samples tests and independent samples tests on collected data I chose to disregard significance and instead focus on the descriptive statistics and percentage change.

*Table 1.1: Mean scores and SD for HR, HRV, IAMS and SIE at Baseline, Pre- and Post-test.*

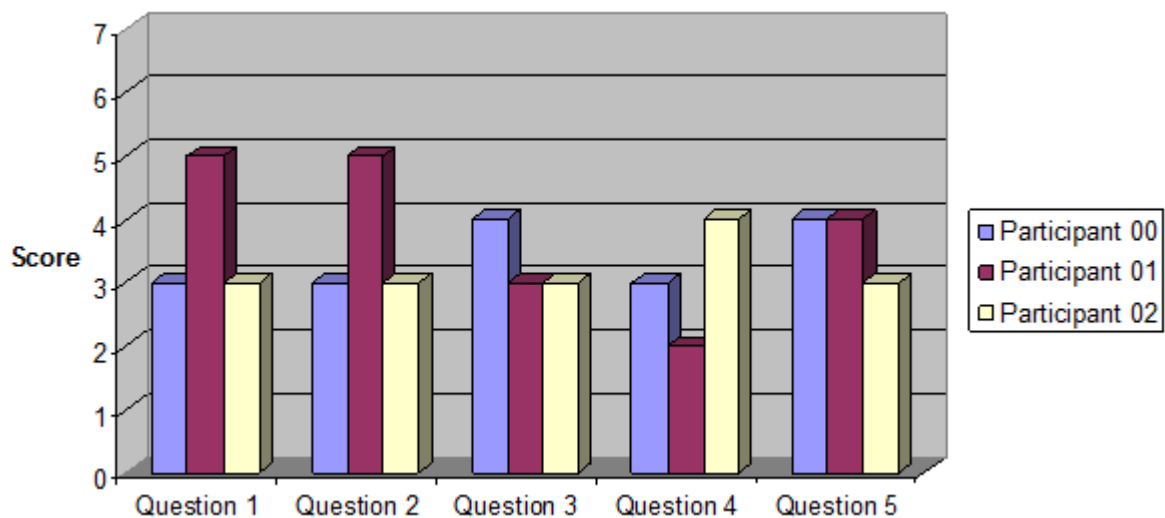
	DIMENSION	BASELINE		SD		PRE		SD		POST		SD	
		I	C	I	C	I	C	I	C	I	C	I	C
<b>HR</b>	BPM	57,67	64	9,7	4	83	73,33	15	18,6	69,33	75,67	10	18,8
<b>HRV</b>	RMSSD (ms)	75,10	71,80	43,1	24,9					45,57	64,96	9,8	67,0
	SD1 (ms)	53,07	50,70	30,5	17,6					32,20	45,90	6,9	47,4
	LF (%)	<b>31,10</b>	33,66	21,4	7,8					<b>18,67</b>	49,50	10,5	2,9
	HF (%)	33,20	41,00	22,6	18,3					5,33	9,73	3,8	0,7
	LFHF ratio (%)	124,06	103,06	86,9	70,2					410,90	508,50	151,5	11,0
<b>IAMS</b>	1: CA - Extent					4,33	4	1,5	1	2,33	3,67	0,6	0,6
	2: CA - Direction					-1,33	-1,67	1,5	0,6	-1,67	-1	1,5	0,0
	3: CA - Frequency					4	4,67	2,6	0,6	2,67	4	1,1	1,0
	4: SA - Extent					3,67	4,67	0,6	0,6	3	3,67	2,6	1,5
	5: SA - Direction					-1,67	-1,33	1,1	1,1	-1,67	-0,67	1,5	1,5
	6: SA - Frequency					3,33	4,67	1,5	0,6	3,33	3,67	2,3	1,5
	7: SC - Extent					3	3,67	1,7	1,1	4	4,33	1,0	0,6
	8: SC - Direction					-0,33	0	3,0	2,0	0,33	0,33	3,0	1,5
	9: SC - Frequency					4,33	3,33	2,3	1,1	5	3	2,0	1,0
<b>SIE</b>	Visual					12,33		1,5		16,33		3,5	
	Feelings					11,67		3,5		11		2,6	
	Tastes					8,33		4,5		9		4,3	
	Sounds					10,33		5,0		9,33		2,5	
	Emotions					10		4,0		11,33		2,0	
	Smells					6,33		3,2		6,67		3,0	
	External					12		4,3		16		4,0	
	Internal					12,33		2,0		11,67		3,8	
	Control					12,33		2,3		13,33		1,1	

Note. Intervention; n = 3. Control; n = 3.

### 3.1.1 Manipulation check - test situation

The intervention group increased average HR from baseline to pre-test with 30,5 % while the control group increased with 12,7 % (Table 1.1). Furthermore, all HRV scores (except for LF% in the intervention group) were consistent with today's theory, that is, lower RMSSD, SD1, HF and higher LF, LF/HF % indicates increased anxiety (Table 1.1). In addition to these results, the IAMS (Table 1.1), the observations (Table 1.3) and the interviews also indicated a certain degree of experienced anxiety among the participants toward the test situation.

### 3.1.2 Control of intervention



*Figure 1.3: Post intervention control, individual scores.*

The participants had to answer the following questions: 1) Was it hard to relate to the manuscript? 2) Was it hard to perform the imagery? 3) Did you find the manuscript meaningful? 4) How did you experience possible emotions? 5) To what degree did you find the manuscript helpful/not helpful? As figure 1.3 illustrates, the answers revealed a quite average perception of the intervention as a whole, which tells us that something toward the intervention did not work as planned. Only participant 01 stood out with a rather high score on question 1 and 2.

### 3.1.3 Average HR

The intervention group displayed a decrease of 16,5 % in average HR from pre- to post-test as opposed to the control group who actually displayed an increase of 3 % (Figure 1.4).

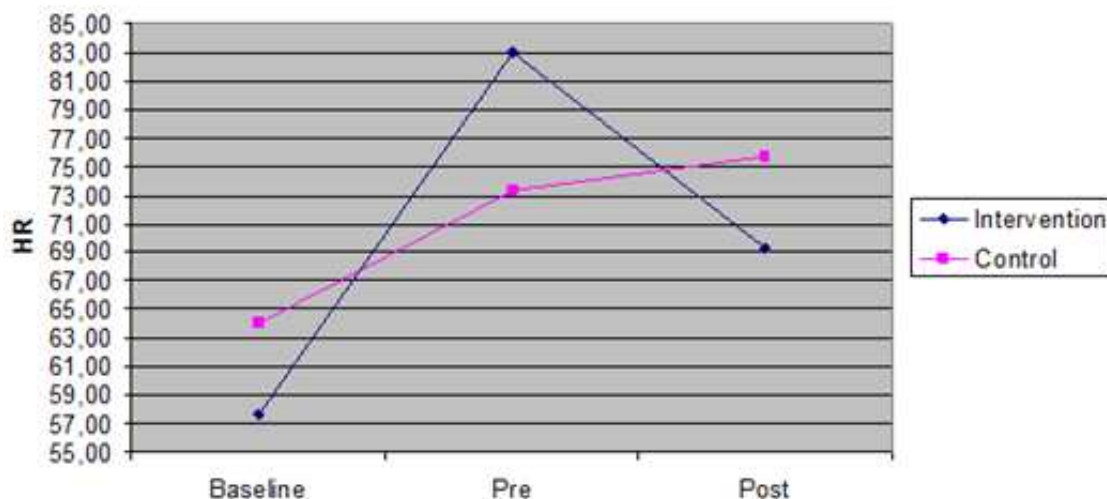


Figure 1.4: Mean average HR in both groups at Baseline, Pre- and Post-test.

### 3.1.4 Immediate Anxiety Measures Scale

Table 1.2: Difference in mean IAMS between Pre and Post in both groups.

IAMS	INTERVENTION		CONTROL	
	M	Signifies %	M	Signifies %
1: CA - Extent	-2	<b>46 % reduction</b>	-0,33	8 % reduction
2: CA - Direction	-0,34	20 % more negative	+0,67	<b>40 % less negative</b>
3: CA - Frequency	-1,33	<b>33 % reduction</b>	-0,67	14 % reduction
4: SA - Extent	-0,67	18 % reduction	-1	21 % reduction
5: SA - Direction	0	No difference	+0,66	<b>49,6 % less negative</b>
6: SA - Frequency	0	No difference	-1	21 % reduction
7: SC - Extent	+1	<b>25 % increase</b>	+0,66	15 % increase
8: SC - Direction	+0,66	<b>200 % increase</b>	+0,33	100 % increase
9: SC - Frequency	+0,67	13 % increase	-0,33	9,9 % decrease

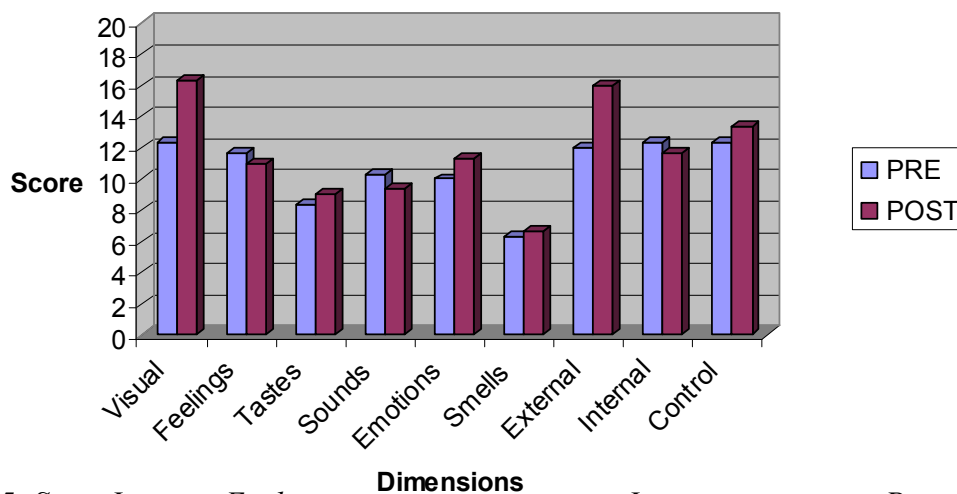
5 dimensions had a better development in the intervention group opposed to 4 in the control group. Most prominent in the intervention group were a reduction of 46 % in the cognitive anxiety intensity score, a reduction of 33 % in the cognitive anxiety frequency score, an increase of 200 % in the self-confidence direction score and an increase of 25 % in the self-confidence intensity score (Table 1.2).



As anticipated the control group also experienced a positive development, and most prominent was a 40 % increase in the cognitive anxiety direction and a 49, 6 % increase in the somatic anxiety direction (Table 1.2).

Finally when looking at table 1.1 we can see that none of the two groups perceived neither the cognitive anxiety nor the somatic anxiety as facilitative, independent of whether it was pre- or post-test.

### 3.1.5 Sport Imagery Evaluation – intervention group



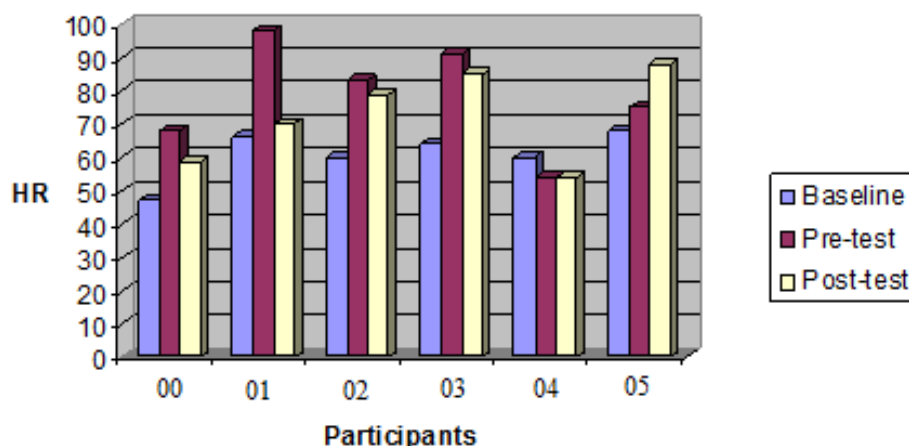
**Figure 1.5:** Sport Imagery Evaluation-test, mean scores – Intervention group, Pre- and Post-test.

Figure 1.5 displays a positive development in 6 of 9 dimensions and both the visual and external dimension stands out with an increase of 25 %. In other words, the SIE-test scores indicate that the intervention itself improved the group’s imagery ability. Still, when looking at Vealey & Greenleaf’s scoring (2006, p. 348): Excellent (20-18), Good (17-15), Average (14-12), Fair (11-8), Poor (7-4), one can see that the participants had much room for improvement.

### 3.1.6 Presentation of specific cases

**Case 01** displays a quite dramatic decrease (29 %) in average HR from pre- to post-test as opposed to the other participants (see participant 01 in Figure 1.6). Furthermore, from pre- to post-test 01 has a decrease of 50 % in the intensity score of cognitive anxiety as well as a decrease of 43 % in the cognitive anxiety frequency score. In addition to this, 01 also has an increase of 67 % in the self-confidence intensity score (see participant 01 in Figure 1.7). Moreover, compared to participant 02, 01 has lower scores on 7 of 9 dimensions in the SIE-test (see participant 01 in Figure 1.8). Finally, it was only 01 that stood out with a high score on question 1 and 2 in the post intervention control (see participant 01 in Figure 1.3).

Opposed to case 01's decrease in average HR, **case 05** has an increase of 15 % from pre- to post-test (see participant 05 in Figure 1.6). Furthermore, 05 display no differences in the self-confidence scores, but have a decrease of 60 % in the cognitive anxiety frequency score, a decrease of 40 % in the somatic anxiety intensity score, an increase of 150 % in the somatic anxiety directional score and finally a 40 % decrease in the somatic anxiety frequency score (see participant 05 in Figure 1.7).



**Figure 1.6:** HR scores on all participants at Baseline, Pre- and Post-test (n=6).

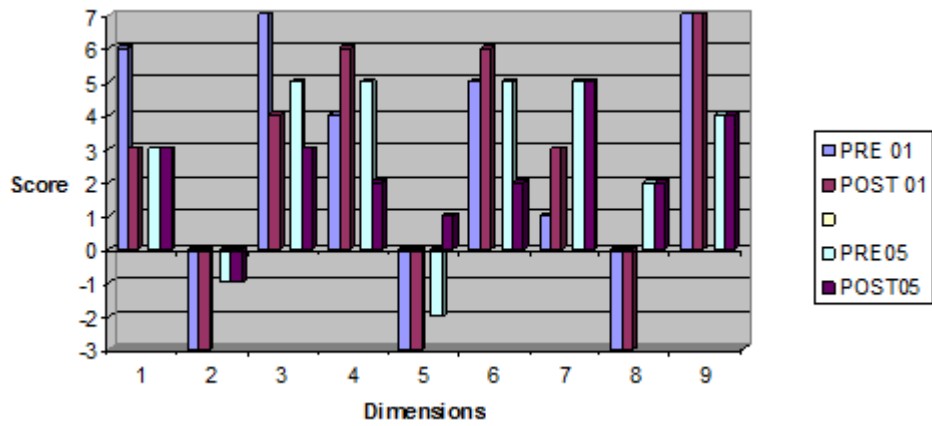


Figure 1.7: IAMS PRE and POST scores on participant 01 and 05.

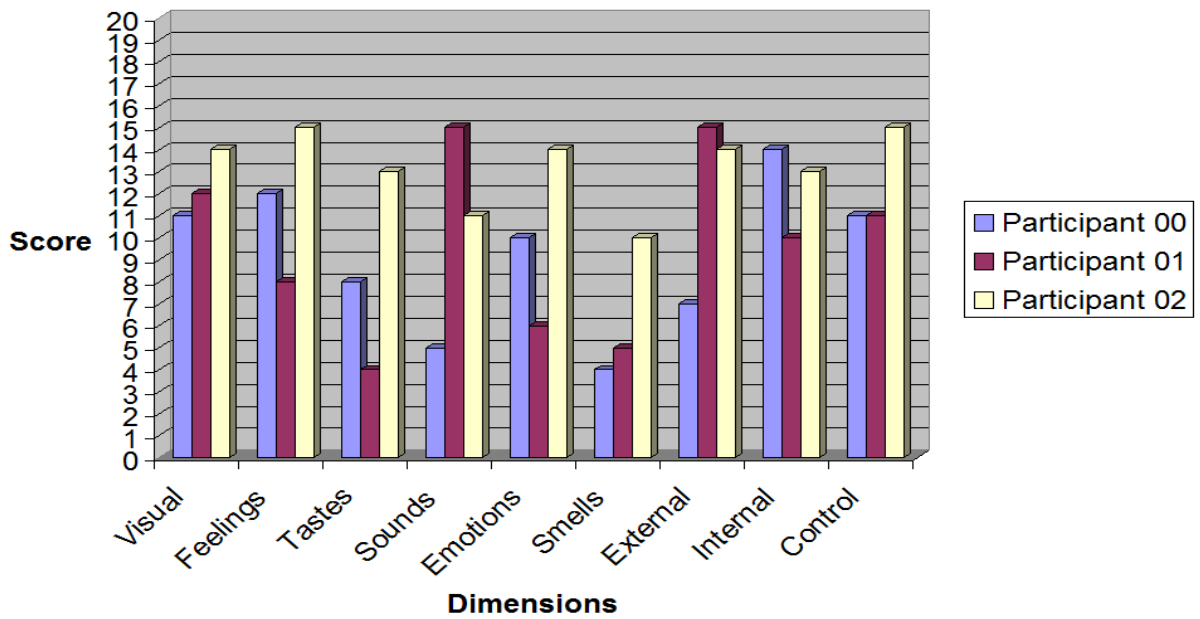


Figure 1.8: Sport Imagery Evaluation-test, individual scores – Intervention group, Pre-test.

## **3.2 Part 2: Qualitative results**

Combining different methods like in this study is one way to strengthen as well as increase the credibility of a study. Combining methods like this is a concept known as triangulation and when carried out in the appropriate way, triangulation is said to be the ideal research approach (Patton, 1990). Basically, triangulation strengthens a study by combining different approaches that complement each other depending their strength and weaknesses (Arksey & Knight, 1999; Patton, 1990). The qualitative approach in the present study consisting of logbooks, observations and interviews were considered as best suited to shed light on the quantitative results.

### **3.2.1 The logbooks (Appendix I)**

The participants in the intervention group were told to write a brief note every day regarding their imagery sessions, and the logbooks revealed the following:

- None of the participants visualized every day during the intervention. More precisely participant 00 lost three days, participant 01 lost four days and the worst case was participant 02 which lost eight days altogether.
- Generally, the participants visualised more by heart than with help of the manuscript or the sound-track. They also reported that the sound-track was a bit too fast, which made it hard to keep up. Despite being too fast, one of the participants reported that the imagery sessions became easier with help of the sound-track.
- All participants reported having trouble visualizing at some point during the intervention. This was clearly prevailing in the beginning, but also occurred now and then randomly throughout the intervention. The following possible explanations were reported:

- *in the beginning before knowing the manuscript by heart*
- *visualizing in the living room with the TV on*
- *visualizing on the bus with music in my ears*
- *internal visualization is hard / not working*
- *stressed out*
- *eyes open*
- *too relaxed...got sleepy*
- *too much disturbance*
- *loss of motivation*

- All participants reported it being much easier to visualize externally.
- Generally, the participants reported it getting easier to visualize as time went by. One of them found out that lying on the tummy was most effective, and another participant made changes to make the manuscript more believable.
- One participant reported that it was hard to actually believe in what the manuscript said. In addition to this, the participant reported not having enough time to make use of the sound-track.
- During the last week of the intervention one participant reported: “I can see myself as self-confident”. “I notice that my voice is clear and strong”. “I feel really prepared for tomorrow since I’ve been there before in my head”.

### 3.2.2 The observations (Appendix D)

Table 1.3: Observations.

Intervention group		
Participant	PRE	POST
<b>00</b>	00 looks very comfortable throughout the presentation. Still, it looks like a bit of nervousness shines through from time to time. The fact that 00 looks at the PPT a bit much can imply several things like for example that, 00 has not prepared good enough or doesn't want eye contact with the audience. In this case it seems like a combination of both. Altogether 00 appears to be well prepared and radiates a minimal amount of nervousness.	00 looks a bit more relaxed this time. The voice can be interpreted as a bit nervous in the beginning, but this fades rapidly. A bit of shaky hands appears a few times. 00 only looks at the PPT when natural and does not use a manuscript. 00 seems very confident and gains a good relationship toward the audience. Altogether 00 delivers a very good presentation. Observer nr2 ( <b>O2</b> ) display very similar observations as observer nr1 ( <b>O1</b> ), but does not notice the voice or hands.
<b>01</b>	01s body language radiate a lot of self-confidence. Still 01s voice indicates a bit of nervousness, which makes it seem like 01 is a bit nervous throughout the presentation. 01 knows everything by heart, which can indicate that 01 maybe have prepared a bit too well. Despite knowing everything by heart, 01 looks quite a lot at the PPT. In this case this surely indicates that 01 wishes to avoid eye contact with the audience.	01 seems very well prepared and delivers a great presentation. 01 gains a good relationship with the audience as well. <b>O1</b> is not able to detect any signs of nervousness this time. 01 even answers all the questions in the end, and does not seem bothered by the questions at all. <b>O2</b> observes a bit of fidgeting and a tendency of standing restless. In spite of this, <b>O1</b> and <b>O2</b> have almost identical observations. Altogether 01 clearly delivers a more solid presentation this time.
<b>02</b>	02 carry a self-confident voice throughout the presentation. 02 looks much at the PPT, but it does not seem like it is because 02 wants to avoid eye contact with the audience. 02 seem well prepared despite being a bit dependent on the PPT. Still 02s excessive fidgeting with the lectern throughout the presentation implies that 02 was a bit nervous after all. Altogether 02 does not seem very affected by the situation.	02 seem less prepared this time. The voice and body language implies that 02 is very self-confident, but the fact that 02 speaks faster than normal and almost solely reads everything of the PPT implies that 02 is a bit nervous after all. <b>O1</b> and <b>O2</b> s observations are very similar. Altogether 02 actually seem more nervous this time as well as less prepared.

Control group		
Participant	PRE	POST
03	03 seems a bit stressed throughout the presentation as well as not standing of as very well prepared. The fact that 03 reads a lot straight of the PPT supports this statement. 03 also make a lot of “eeeh-sound” where there should be natural pauses in the presentation, which is a pretty clear indication of nervousness. It also looks like 03 tries to avoid eye contact with the audience throughout the presentation. 03 stands quite restless, and also keeps the arms crossed over several minutes. Altogether it seems like 03 is experiencing quite a lot of discomfort during the presentation.	Seems a bit calmer today but still comes of as a bit stressed despite seeming better prepared than last time. 03 looks more confident as time goes by. Not much “eeeh-sounds” today. 03 still looks a bit much on the PPT, which decrease the chance of establishing a good connection with the audience. Body language seems more relaxed this time. Altogether 03 still seems to experience quite a lot of discomfort, though not so much as the last time. It may be that 03 was better prepared for presentation number two. <b>O1</b> and <b>O2</b> have a similar understanding, but <b>O2</b> does not notice the “eeeh-sounds”. On the other hand, <b>O2</b> does notice a bit of shaky hands.
04	04s body language radiates a lot of self-confidence, and 04 seems to be well prepared. Still 04 have few natural pauses without “eeeh-sound”. 04 tend to depend a bit too much on the manuscript even though it seems like 04 don’t really need to. 04 also have an unnatural amount of movement in arms and legs. Altogether, even though 04 radiates a lot of self-confidence, 04 seems to be a bit nervous throughout the presentation.	04 still looks very self-confident, but it seems like 04 is less prepared this time. 04 still have very few natural pauses without an “eeeh-sound”, and the voice seems a bit shaky and unsecure throughout the whole presentation. Altogether the conclusion is the same as the first time. That is, 04 seems confident and unsecure at the same time. <b>O1</b> and <b>O2</b> have a very similar understandings, but <b>O2</b> does not notice the “eeeh-sound”.
05	05 seems calm, relaxed and very well prepared. Still 05 makes a lot of “eeeh-sounds” where there should be natural pauses. 05 also have a lot of unnatural movement in arms and legs throughout the whole presentation. 05 reads to much straight of the PPT, which results in a poor connection with the audience. If this is due to lack of preparation or a desire to avoid eye contact with the audience is hard to say.	05 seems a bit more unsecure today, as well as not giving the impression of being very well prepared (the PPT is good though). 05 still makes “eeeh-sounds” quite often. As well as last time 05 reads to much straight of the PPT, which results in a poor connection with the audience. 05 keeps both hands inside the pockets over quite some time. This can for example be understood as a way of shielding one self, or just a lack of interest. <b>O1</b> and <b>O2</b> have a very similar understanding.

### 3.3.3 The interviews (Appendix G & H)

*Table 1.4: An overview of the interviews.*

<b>SUPERIOR THEMES</b>	<b>SUBORDINATE THEMES</b>	<b>RAW DATA</b>
<b>Opening</b>	Experience with imagery or other methods	<i>pretty limited / a bit / nothing organized / played with the thought / tried it for myself...not worked / not that I have been aware of / very good, if I can do everything in my head I know that I can do it in real life too, I have imagined the perfect scenario, inquire with others / watch videos of others doing it perfect / no, try to picture myself how I am going to do it,</i>
<b>Presentations</b>	Pre-test Intervention  - When - What - How	<i>shortly before / in the beginning of the presentation, on my way down to the stage / when I said my first line, elevated heart rate / palpitation, stuttering or fumbling with words, short of breath / nauseous / dizzy /hot flushes / clammy hands, uncontrolled shaking / mind goes blank, unpleasant lump / butterflies in the stomach, pretty ok / very good / ok say something wrong / thoughts directed toward the physical feelings, most of the thoughts were confirmed, I think everybody can see my discomfort, the audience will think that theirs are better than mine not confirmed, no / that I looked at my manuscript /that I talked fast,</i>
	Pre-test Control  - When - What - How	<i>shortly before x 2 / at the end when there came questions, dry mouth / clammy / a little sweat / hot / nervous voice / restless ok / pretty good / relatively good, I think they noticed my voice and that I was fidgeting, not being able to answer questions, it can go bad, what am I going to say now?, thought about my physical feelings, all thoughts confirmed, no thoughts confirmed x2</i>
	Post-test Intervention  - When - What - How	<i>no not really / on my way down to the stage / on my way to aud. A, the same (elevated heart rate, butterflies ++), finding words, dizziness, nauseous / lump in my stomach, the body was tense / all the sensations was less noticeable, some sensations was not there anymore, no x 2 / confirmed but not to the same extent, pretty ok / it went well / much better now than last time, pretty similar preparation / better prepared than last time / much better prepared to the first presentation, presentation nr 2 was more challenging, I was very calm actually, same thoughts as the first time, compared with others, they might notice my voice, afraid that my presentation would not be as good or entertaining as the others, felt stupid to have so much on the PPT, no thoughts confirmed, embarrassing smiles sometimes,</i>



<b>Presentations</b>	Post-test Control - When - What - How	<i>shortly before x 2 / nothing,          shaky voice,          much of the same feelings,          hot,          elevated heart rate,          no feelings,          same thoughts as last time / little to say / no thoughts confirmed,          my voice and body language / "nervous voice",          equally prepared / better prepared for the first presentation x 2,          pretty ok / very good / same as last time,</i>
<b>Test situation</b>	Influence in general - Video camera	<i>very little / little influence / no influence on me / no notice,          just after the presentations / shocking when I heard it at first,          did not think about it x2 / not so much / not at all / shut it out,</i>
	Perception/ credibility	<i>a bit unnatural,          did not matter / no consequences,          difference between 10 and 150,          realistic enough to make me give a 100 %,          not 100 % realistic / pretty realistic / real,          it gave the exact same feelings as I usually get,          you want to do your best,          more focus on experience rather than a top grade,          enough to provoke discomfort,          tried to focus on the thought that this was only a project...still I was          nervous about having presentations in aud. A,          took it very seriously,</i>
<b>Method/ intervention</b>	Change	<i>leave out some of the first parts,          more on the presentation part,          open for personalization,          too general,          leave out smells,          change settings,          more physical feelings,          no,          maybe too long,</i>
	Belief	<i>belief in imagery as a method,          half-hearted,          no / too stressed out as a person,          not the "imagery-type" of a person,          unable to sit down and relax,          yes because I had tried it before,</i>
	Introduction	<i>too thorough,          good lemon exercise,          ok,          should be taught how to do it,          more practical exercises,          more examples,          ok introduction to imagery in general,</i>
	No intervention	<i>ok / quite ok,          did not influence me,          a little suspicious,          it did not influence my effort to presentation nr 2,          did not prepare less for nr 2 because of it,</i>

**Experience:**

The interviews revealed that, all participants in the intervention group had at one point tried imagery by them selves, but not systematically and without any form of proper instruction or guidance:

*I have tried it a bit before and did not feel like I could master it very well. It has only been one session here and one session there. I have never attended any course or had any guidance when it comes to imagery.*

Only one of the participants in the control group reported having any experience with imagery, which also implied not being systematically and without any form of proper instruction or guidance: “When I practise for a presentation I try to see how I am going to do it”.

**Test situation:**

Several questions were asked to find out whether the participants found the testing situation realistic or not. That is, was the situation similar enough to a real presentation that it triggered any anxiety? Without exception all participants experienced it as quite similar to a real presentation:

*I was nervous since the presentation was to be held in Auditorium A; I found it realistic... took it very seriously; I was surprised that I found it as realistic as I did. Just being in such a big room was enough to make me nervous; it did not feel 100 % realistic. But I got the exact same feelings as I usually do; you always want to do your best for your own sake.*

**Intervention group:**

Questions to the pre-test revealed that almost all known typical somatic symptoms of PSA were represented within the group:

*I get nauseous, palpitation, dizzy, hot flushes without sweating, clammy hands and uncontrolled shaking in my body. It is hard to describe, but I feel like I get a really uncomfortable lump in my stomach. Quite simply I feel pain, in addition to this I get this uncomfortable tingling in my stomach.*

It was also a common thought among the participants involving being afraid of negative evaluation in one form or another:

*I just worried about saying something wrong, even though I knew that there was little chance of it happening; they were actually more concentrated around my own physical feelings. For example I thought...please do not shake, do not shake and please do not stutter. In other words, I worried about what the audience could notice.*

The interesting question then was whether the participants in the intervention group experienced a less degree of anxiety during the post-test opposed to the pre-test, and if so, why did they? Altogether the participants gave impression of a certain degree of improvement:

*I had the same uncomfortable lump in my stomach this time also, but the uncontrollable shaking which I usually experience was not there anymore. I was nervous and my body was tense. Otherwise I felt the usual symptoms, but this time they were much, much milder, and some of them were not there at all; I actually felt very calm; I put more pressure on myself this time by having to remember more by heart.*

Furthermore, the possible explanations to their improvement were quite similar: “I found the theme in the post-test much more interesting than the previous theme. I was simply better prepared this time”. This participant was then asked if the improvement could have had anything to do with the fact that there was a low amount of spectators during the post-test: ”I do not think that the amount of spectators really mattered. It was more like I had done this once before, and then knew what to expect”.

Only one of the three participants really gave credit to the manuscript: “I felt really calm when it was drawing near. I felt really safe because I had already been there inside my head. I am like, if I can do it well in my head, then I know that it will go well in real life too”. Also another participant mentioned that the manuscript had made it easier to think more positive in general.

Belief is a strong force which absolutely could have affected the results of this study. Just think of the placebo effect for example. In this study however, it was interesting to know if the participants were open to the imagery method, or if they did not believe in it at all. The answers were quite mixed. One said the following: “I believe in imagery as a method. But I also believe that a manuscript have to be personalized”. Another said: “Honestly I have to say no”. Only one of the participants gave the impression of truly

believing in imagery: “if I can do everything in my head, then I know that I can do it in real life too”.

Finally, it was assumed that a short introduction would be sufficient for the participants to get the hang of imagery as a method. However, the participant’s response to this was mixed as well. Two of the participants found the introduction ok, but felt that it lacked enough examples and exercises, and the last participant said that it was: “Too thorough”.

**Control group:**

Opposed to the intervention group, the control group did not report nearly as many somatic symptoms in the pre-test: “I felt a bit shaky, high pulse and a bit dry in my mouth... and restless”.

Similar to the intervention group and maybe even more so, the control group reported a fear of both direct and indirect negative evaluation from the audience: “What shall I say now? And I am very conscious about my physical feelings. I think that, this is something they can see... that I am nervous”. Another said: ”...worried that people might talk negatively about me and my presentation”.

As expected the control group also experienced a certain degree of improvement from pre- to post-test: “It was worst right before... but less uncomfortable than during the first presentation... the main reason for this was that this time I was more familiar with the theme”. Despite this general experience of improvement, two of the participants reported being better prepared for the first presentation, as well as ensuring that this was not a result of them not being introduced to the imagery manuscript.

## **4. Discussion**

The aim of this study was to investigate the effect of a “positive imagery manuscript based on the PETTLEP model”, on the degree of PSA, and it was hypothesised that such a manuscript would reduce the anxiety. Generally, the results from the different measures confirmed this hypothesis, but before going into detail regarding the results, methodological considerations will be discussed.

### **4.1 Method**

The design used in this study is one of the strongest designs there is, however the “True experimental design” also known as a “Blind, pre-test post-test, randomized experimental design” is considered even stronger (Thomas, Nelson & Silverman, 2005). The most prominent difference between the two is that, the latter includes a third group receiving placebo which contributes to an even stronger internal validity by evaluating whether the observed effect is caused by the treatment or other psychological factors (Thomas, Nelson & Silverman, 2005). To make use of such a design there are certain criteria that needs to be fulfilled, and after having a talk with Ingar Morten K. Holme (e-mail, 18th May 2011) it became evident that this was not a design suited for the present study.

A purposive sampling technique was used in this study since there was need for participants with certain characteristics, consequently limiting the opportunity to generalize the results because of the researcher’s possible subjectivity (Black, 1999). In addition to this, the design chosen for the present study required that the groups were randomized to control for both anticipated and unanticipated variables. In principle this is a good thing, but as Thomas, Nelson and Silverman (2005) point out, it can also be a bad thing if it turns out that there are huge differences between the groups, thus making a comparison totally unrealistic. Results from this study however revealed the homogeneity as satisfactory for comparison between the two groups.

Regarding the sample size, the representative sample (with normally distributed scores/data) of  $n=6$  in this study being way lower than  $n=30$  increased chance of sampling errors. Furthermore, such a small sample also made it hard to find any

significance. The reason for this is simply that, a small sample requires a greater difference between the means to find any significance opposed to corresponding situations with larger samples (Black, 1999). In sum, a small sample size weakens the statistical power, consequently increasing the chance of making Type I and Type II errors (Black, 1999).

Concerning the test situation, it is generally challenging to make such a situation as similar as possible to a realistic situation. More specifically, the big challenge is to make the situation provoke the same somatic and cognitive reactions (which in this case are anxiety symptoms) as a real situation would have done. This is important because you want to prove that the method (or treatment) you are testing works in real situations as well, and if this fails, it will be problematic finding significant differences, if any.

Replicating a real situation proved to be rather challenging in the present study also. There was not a great interest (could be other reasons) among students nor among the employees at NIH to watch the participants' presentations, but since this was a calculated risk, a video camera was installed to compensate for a possible lack of spectators (Vassilopoulos, 2005). However, during the interviews none of the participants reported any reactions worth mentioning toward the fact that they were videotaped. On the contrary, when looking at the results altogether there is a clear coherence that indicates experienced anxiety among most of the participants. In other words, it seems like the "test situation -challenge" was overcome. Of course the results could be explained by other factors like e.g., that they were nervous about something that was going to happen later that day, or that they thought about something that scared them, though this was not likely. Furthermore, all presentations were done at the same time and day during the week to make the pre- and post-test as similar as possible. Finally, the setting of the observations could be considered both natural and unnatural at the same time (Witt, Brown, Roberts, Weisel, Sawyer & Behnke, 2006). It could be considered as unnatural because it was staged and the results of the participants' presentations would not really matter. However, a presentation is a presentation and therefore the setting could also be considered as natural.

Subjective appraisal toward the effectiveness of the intervention was illuminated through the post intervention control and the interviews. The controls told us that the

intervention did not work as anticipated, and what the interviews revealed will be presented later on. Furthermore, the SIE-tests only revealed fair imagery ability among the participants which could explain why the effect of the imagery manuscript appeared to be less than expected. Finally, it is also possible that the PETTLEP model could be better suited for imagery manuscripts based on physical activity, rather than public speaking situations.

#### **4.2 Hypothesis 1: Decrease in measured HR**

Heart rate is a good physiological indicator toward experienced anxiety, and like HRV, it is the ANS that principally controls the heart rate frequency (Sztajzel, 2004).

However, like all other measures, the HR measures can also become unreliable if extraneous variables (in this case related to the ANS) are not controlled for.

Consequently, the HR measures were standardized, hence, carried out at the same time of day, in the same order and in the same way during baseline (not in the same order), pre- and post-testing. In addition to this, all participants had to fill out an information form (Appendix K) and were told not to eat, drink or do any kind of physical activity during the last two hours prior to testing.

In line with previous research (Hardy, 1996; Hu, Bostow, Lipman, Bell & Klein, 1992) the results in the present study came out as valid, and indicated an increase in mean average HR, that is, an indication of increase in experienced anxiety, in both groups from baseline to pre-test. These findings are also supportive of Williams, Cumming and Balanos' study on athletes' appraisal states (2010), which demonstrated an increase in mean HR from a neutral situation to a situation perceived as more threatening and, or challenging. If following the same procedures as in the present study, the probability of obtaining similar results in similar situations such as e.g., on soccer players sitting on the bench opposed to immediately prior to a penalty shot, are considered high.

Furthermore, in support of the hypothesis, the development from pre-test to post-test revealed a pronounced improvement in the intervention group, and in all, the intervention group had a decrease of 16.5 % in mean average HR, opposed to the control group's increase of 3 % (Table 1.1). Though not measured in a realistic situation, Hu, Bostow, Lipman, Bell and Klein (1992) found that positive thinking prior to a phobic situation could reduce cardiovascular responses, which is similar to the

findings in the present study. Given that it was the imagery manuscript that caused the intervention group's results, and that these results were equal to a decrease in experienced anxiety we can say that, a positive imagery manuscript based on the PETTLEP model can and will reduce experienced anxiety in situations similar to the one in the present study (e.g., physical education teachers, coaches, physical education students, athletes). This statement is supported in Ramsey, Cumming, Edwards, Williams and Brunning's (2010) study on emotion toward PETTLEP-based imagery with penalty shots in soccer, who also found decrease (though not significant) in experienced anxiety. However, even though many of the different extraneous variables that could influence the HR measures were taken into consideration in this study, we still can not explain the intervention group's results solely as an effect of the imagery manuscript. This will become more evident throughout the discussion.

#### ***4.3 Hypothesis 2: Positive development in the IAMS***

Even though established both valid and reliable by Thomas, Hanton and Jones (2002), the IAMS like most other self-report methods (like e.g., the SIE-tests, the Log's, the post intervention controls and the Interviews in the present study) can be untrustworthy. Because of this, it is important to be aware of what can affect the results like e.g., that people can choose to respond in a way that they feel are socially correct rather than being sincere, they can forget how they felt, they can be influenced by the mood they are in, or they may quite simply have trouble understanding the questions (Halvorsen, 2008; Podsakoff, MacKenzie, Lee & Podsakoff, 2003; Thomas, Nelson & Silverman, 2005). In addition to this, there is a phenomenon known as "consistency motif", which basically implies the possibility of participants trying to answer the questions rationally and consistently (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). Moreover, there are "illusory correlations" and "implicit theories", which suggest that participants may have a comprehension toward the current theme prior to the test, which then again can influence the way they answer (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). Bearing this in mind, one can see that there might be several explanations to the change in the IAMS scores other than the effect of the imagery manuscript alone. However, it is evident that the developers of the IAMS took many of the listed factors into consideration when looking at the instructions and examples enclosed (Appendix C; Thomas, Hanton & Jones, 2002).



The IAMS results indicate a general decrease in experienced anxiety for both groups, which for the intervention group's case is in accordance with Lang's (1977) suggestion, that imagery makes it possible to optimize responses to whatever situation. It is the intervention group who again altogether displays the best development, and most eminent are the decrease of 46 % in the cognitive anxiety intensity score, a 33 % reduction in the cognitive anxiety frequency score, an increase of 200 % in the self-confidence direction score and an increase of 25 % in the self-confidence intensity score (Table 1.2). Moreover, the intervention group compared to the control group almost doubled all of the self-confidence scores, which is in line with Weinberg's (2008, p. 7) statement: "There have been a number of studies demonstrating that imagery can improve levels of self-confidence in a variety of different tasks", and the aim of the study. Furthermore, these results are also consistent with Vadocz, Hall and Moritz's (1997, p. 241) study where they investigated the relationship between competitive anxiety and imagery use, and finally suggested that: "...imagery can be used to help control competitive anxiety levels and enhance self-confidence". Finally, unlike the findings in the present study, Hinshaw (1991) suggested that too low self-confidence levels in the beginning of the intervention could have explained the weak development in the intervention group's IAMS results because they had to see themselves performing a perfect presentation when visualizing. In sum, the findings just presented substantiate the possible benefits of imagery and its multi purpose properties.

As mentioned earlier, both groups perceived the cognitive and somatic anxiety as debilitating, independent of whether it was pre- or post-test (Table 1.1). These direction scores were not presented to display possible changes in the group's anxiety perception, which in any case would have been unnatural since the imagery manuscript was not developed to do so, but rather they were presented as to compensate for a possible limitation in the present study due to the letter of inquiry. Since the letter of inquiry did not directly point out that the participants should be bothered by any of the thoughts or feelings presented, there was a chance of including participants in the study who did not actually have a problem with PSA, which could have explained the altogether moderate development in the intervention group. Though this was not likely to happen, it definitively could have, thus it was worth taken into consideration. Even though it was not a goal to make the intervention participants perceive anxiety symptoms as more facilitative, this still could have happened, which according to Martin, Moritz & Hall

(1999) and Hanton, Mellalieu & Hall (2004) would have been due to the imagery increasing self-confidence, consequently promoting a facilitative anxiety perception. However, this does not seem to be the case when looking at the results in table 1.1. In sum, this elaboration leaves out a facilitative perspective of the anxiety components as being a probable explanation to the altogether moderate development in the intervention group, thus leaving us to compare the HR and IAMS results.

The question is whether there is consistency between the HR and IAMS results, and the answer is yes. First, there is consistency when comparing the HR and IAMS pre-results in the way that, both sets of results indicate that most of the participants in both groups experienced anxiety. Second, the intervention group displays a decrease in mean average HR from pre- to post-test which indicates a decrease in experienced anxiety, which is consistent with the development of the intervention group's IAMS results from pre- to post-test, which also indicates a decrease in experienced anxiety. Consequently, the results discussed so far increase the credibility of the HR and IAMS measures (Patton, 1990). Finally, as with the HR measures, even though many of the different extraneous variables that could influence the IAMS measures were taken into consideration, we still can not explain the intervention group's results solely as an effect of the imagery manuscript.

#### ***4.4 Hypothesis 3: HR and IAMS results compared with the SIE-test, observations, logs and interviews***

##### **4.4.1 Sport Imagery Evaluation – intervention group**

The SIE-tests were included to provide a possible explanation to the IAMS and HR results, and the SIE-test results principally revealed two things. First, it revealed the imagery ability as fair among the intervention participants, which logically could explain the group's moderate development (Vealey & Greenleaf, 2006). Moreover, this finding is in line with Vadocz, Hall and Moritz' (1997) suggestion, that individuals with high imagery ability are better suited to change responses to specific stimulus from maladaptive to more adaptive. Second, as anticipated an improvement in imagery ability was revealed within the intervention group, presumably due to the participants' repeated imagery sessions over the five weeks. Though only being speculations, when

considering the results from the interviews, the improvement logically would have been greater if the imagery introduction had been more applied and if the participants had received more following-up throughout the intervention. Furthermore, the improvement in imagery ability being rather moderate, was actually contrary to what was assumed earlier about the imagery method being easy to learn, and in accordance with Pensgaard and Hollingen's (2006) suggestions, a possible explanation to this rather moderate improvement could be the manuscripts not being personalized.

#### **4.4.2 The observations**

In the beginning of the observation scheme's (Appendix D) development, tallying was considered as a way of executing the observations. This idea was quickly put aside since it did not really tell how the individuals behaved, thus the choice fell on using 10 signs as guidelines during the observations, with a holistic description as a result. More specifically, the observations could be understood as a kind of combination between frequency counting and continual recording (Thomas, Nelson & Silverman, 2005).

Observations were conducted to see if it was possible to register any differences in behavior from pre- to post-test. Generally, anxiety can be tough to observe and interpret since people sometimes exhibit behavior that can be interpreted as signs of anxiety even though they are not anxious at all. Also there are highly anxious people that do not display any signs of anxiety at all. Since these phenomena threaten the observations' validity and reliability, it is important to execute the observations in a holistic way (Thomas, Nelson & Silverman, 2005). In other words, it is important so see "the big picture" and not only focus on the observation scheme alone. Finally, the observations were performed unobtrusively because it was assumed that the participants would experience higher pressure when thinking about the presentations being analysed and rated by someone considered important.

Objectivity can be quite difficult to obtain since perception is highly individual, thus the decision fell on using another observer in addition to the first one during the post-test observations (Thomas, Nelson & Silverman, 2005). The results revealed that the observers had very similar observations, consequently increasing the objectivity of the observations. Furthermore, observational research has several limitations and problems

attached to it such as: having too many behaviors to look for, making too precise discriminations when observing, not having a standardized observation scheme and not securing that the behaviors are observable as well as thoroughly operationalized (Thomas, Nelson & Silverman, 2005). All of these means were taken into consideration in the present study implying, solid preparation, training and systematization of the field notes, thus securing improvement of reliability, authenticity as well as accuracy of the observations (Patton, 1990; Silverman, 2001).

When looking at the results it seems like the intervention group had a better development than the control group. Only one of the participants in the intervention group seemed to have a negative development, while one of the two others had a very positive development. Furthermore, the control group had two participants with a negative development and one with minimal improvement. Altogether these findings were highly consistent with hypothesis number 3.

Of course the simple explanation to the observation results is that the imagery manuscript worked as hypothesized since most of the intervention participants exhibited a positive development. It may well be that the manuscript had a positive effect, but as the discussion continues it will become evident that there was other factors contributing to the positive development as well, which ultimately weakens the study's internal validity (Morris, Spittle & Watt, 2005).

#### **4.4.3 The logbooks**

The logbooks were kept to see how the participants handled the imagery sessions, since e.g., few imagery sessions could explain poor results on the SIE post-tests.

That one of the participants went 8 days without any imagery sessions probably affected the results since the group was rather small in size. Furthermore, all the participants experienced trouble with concentration during the intervention which also could have negatively affected the results of the intervention. Moreover, all participants found it easier to perform imagery externally which according to the PETTLEP model (Morris, Spittle & Watt, 2005; Murphy, Nordin & Cumming, 2008) is not beneficial toward the

current situation. This finding was also consistent with the SIE-test results which revealed an increase in the external dimension (Figure 1.5).

Regarding dose-response effect it is like Morris, Spittle & Watt, (2005) says, little guidance in the literature concerning optimal: 1) frequency between sessions, 2) length of sessions and interventions, and 3) number of sessions in an intervention.

Consequently, even though following Holmes & Collins (2001) and Twining's (1949) recommendations, the weak development in the intervention group both may and may not be explained by the doses in the present study.

#### **4.4.4 The interviews**

Through the interviews it became clear, that a lack of solid experience was something the participants in both groups shared. In the present study this was a good thing as it would not, according to Thomas, Nelson and Silverman (2005), have been appropriate to compare a group with lots of imagery experience to a group who just learned imagery.

As hypothesized, the intervention group had a decrease in experienced anxiety. According to the interviews, this was not exclusively due to the positive imagery manuscript based on the PETTLEP model, but also a consequence of first: some of the participants being better prepared, second: some participants having a more interesting theme in the post-test, and third: the participants knowing what to expect after the pre-test. However, the third explanation to the positive development is interesting because, the participants' feeling of having done it before may very well have been intensified by the imagery manuscript without them being aware of it. Furthermore, the interviews revealed several explanations to why the intervention did not function as well as expected. First: in accordance with Pensgaard & Hollingen's (2006) research, the imagery manuscript was perceived as not being personalized enough, second: there was a general lack of belief in imagery as a method, and third: the introduction to imagery was not sufficiently applied.

Although not as prominent as in the intervention group, the control group had a decrease in experienced anxiety as well, which most likely could be explained by the

fact that they also knew what to expect after the pre-test, as well as some of them reporting having a more interesting theme in the post-test. Bearing this in mind, we can see that it is consistent with most of the results in table 1.1 except for the HR results.

#### **4.5 Presentation of specific cases**

**Case 01** was chosen as the one in the intervention group with the best development in general. That is, 01 was the one who seemingly responded most successfully to the imagery manuscript. Having better imagery abilities than the others in the intervention group could have explained the good results, however when looking at 01s SIE pre-test scores in figure 1.8 compared to participant 02, this does not seem to be the case. Of course the results may be due to the fact that 01 improved the imagery ability faster than the others, thus getting more out of the manuscript during the intervention, however this remains unknown. Concerning the log, 01s lost days probably did not count for much effect, but the fact that 01 preferred external imagery rather than internal may according to the PETTLEP model have made a negative difference (Morris, Spittle & Watt, 2005; Murphy, Nordin & Cumming, 2008). This finding is also in line with Smith, Wright, Allsopp and Westhead's (2007) findings on PETTLEP-based imagery toward sports performance, but as they pointed out, earlier research (Morris, Spittle & Watt, 2005) have also provided evidence for external imagery as being most effective, thus it may be that 01 actually profited through the external perspective. Furthermore, the observations of 01 were consistent with the most of the other results. So far, everything points in the direction of the imagery manuscript working as hypothesized. However, as mentioned earlier the interviews told a different story, where only one of the participants really gave credit to the manuscript and one of the other two reported that the manuscript had made it easier to think more positive in general. In addition to this, 01 was the only one interviewed who (at least in the beginning of the intervention) did not believe that an imagery manuscript would be able to reduce PSA.

**Case 05** was chosen to point out one of the benefits of the triangulation approach. Considering results from the HR and the IAMS measure, case 05 is not easy to interpret (see participant 05 in Figure 1.6 and Figure 1.7). From pre- to post-test the HR results indicate an increase in experienced anxiety, with self-confidence levels remaining the same. Yet, 05 has a decrease in the cognitive anxiety frequency score, the somatic

anxiety intensity and frequency score and finally a positive development in the somatic anxiety directional score, which together indicates a decrease in experienced anxiety (see participant 05 in Figure 1.7). Logically, these IAMS scores should correspond with a decrease in average HR in the post-test, but as the results clearly points out, this is not the case. Looking back at 05s observation results one can see that they are consistent with the HR results, which again strengthens the belief that 05 experienced more anxiety in the pos-test opposed to the pre-test. On the other hand, the interview of 05 supports the IAMS results, which of course does not help in the search of a clear answer to what 05 really experienced.

Taken what has just been presented into consideration, one can see that case 05 is the perfect example of what can happen if there are too few sources of data. For example, if there only were HR results it would have been easy to assume that 05 had an increase in experienced anxiety, and contrary if there only were IAMS results it would have been quite easy to assume the opposite. In the present case, the triangulation approach did not result in a final answer regarding whether 05 experienced a higher degree of anxiety or not in the post-test. However, the triangulation made it possible to approach and evaluate the question from different perspectives, consequently increasing the understanding of the situation and the chance of finding an answer (Patton, 1990).

#### ***4.6 Ethical considerations***

First of all it should be emphasized that the present study was approved by NSD (Appendix J). Furthermore, “the Declaration of Helsinki” (WMA, 2008) and “the Vancouver Convention” (ICMJE, 2008) were part of this study’s foundation from the start. That being said, conducting an experiment which includes exposing individuals to unnecessary anxiety is not ethical at all. In present study though, the anxiety which the participants experienced was very much like what they had experienced from before in e.g., school contexts.

The participants were fully aware of what they had to go through after reading the letter of inquiry and participating in the first session. They also knew that their legal rights such as; “the right to privacy or nonparticipation, the right to be anonymous, the right to confidentiality and the right to expect experimenter responsibility” would be complied

(Thomas, Nelson & Silverman, 2005, p. 88). Finally, both groups of participants would be able to benefit from the experiment by going through the same intervention, though at different points in time.

Even though knowing it to be unethical, all participants were deceived when they were told that their presentations would be videotaped as well as analysed and rated by professional lecturers from NIH later on (Cozby, 1993). This was done in an attempt to increase the participants experienced pressure in general, as an “anxiety security” if few people turned up to watch and as a way of securing unobtrusive observations. Of course these reasons do not make deception ok, but according to Cozby there is an official justification for deception: “...it is a way to make sure that the subjects behave naturally and spontaneously, so that researchers get a better picture of real behavior” (1993, p. 192), and in addition to this, the benefits of participating in the study were considered to weigh out the negativity of the deceit (Thomas, Nelson & Silverman, 2005). Moreover, a debriefing like the one performed in the end of the present study is known as a traditional solution to the ethical considerations toward deceit (Cozby, 1993).

The unobtrusive observations were not done unobtrusively as to avoid the participants behaving in an unusual way, which is usually why one performs observations unobtrusively (Patton, 1990), rather it was because it was desirable that they experienced higher pressure when thinking about the presentations being analysed and rated by someone they might consider important. If the participants knew that it was someone unimportant observing them it might not have affected their experience to the same extent.

Finally, it is worth mentioning that a cheating declaration was signed and handed in to “NIH’s servicetorg” along with the finished master thesis, and that the key linking the participants’ names to the participant numbers was deleted when the study was finished.



## 5. Limitations

Some of the limitations toward the present study have already been presented. However, there are still some limitations that have to be accounted for.

Purposive sampling like in the present study is considered sampling bias, and consequently weakens the study's external validity toward the general population. However, the purposive sampling increases the external validity toward the PSA portion of the general population, thus it may not be seen as a limitation after all. Furthermore, the small sample size was not beneficial toward the statistics, and actually increased the chance of making Type I and Type II errors, consequently weakening the study's internal validity (Black, 1999; Silverman, 2001). In addition to this, when reviewing the interviews, the internal validity of the study was utterly weakened when uncovering multiple unrelated factors that seemingly contributed to change in the variables measured (Morris, Spittle & Watt, 2005).

The fact that the intervention group had a manuscript to work with between the pre- and post-test opposed to the control group who had nothing, suggests there being a motivational differences between the groups. This effect is known as the "Hawthorne Effect" and is considered a presumable consequence of the design chosen in the present study, thus important to address (Hinshaw, 1991). A natural consequence of this effect could be lack of preparation in the control group, which would lead to greater differences in the results between the intervention group and the control group. However, according to the interviews, this was not the case.

In support of hypothesis number 3, consistency between qualitative and quantitative data like in the present study, increases the credibility of the qualitative data as being objective (Patton, 1990). However, there is subjectivity in the picture since the one in control of the quantitative data decides how to collect and analyse it. Thus, it is possible that the quantitative data only contributes to disguise the qualitative data, making it seem objective (Patton, 1990).

Regarding the HRV and HR measures, the decision fell on collecting 30 seconds of data, when instead there should have been collected at least 4-5 minutes worth of data from every measurement to secure reliability and validity (Dishman, Nakamura, Garcia,

Thompson, Dunn & Blair, 2000; Vanderlei, Pastre, Hoshi, Carvalho, & Godoy, 2009). Finally, according to Morris, Spittle & Watt (2005), the developers of the SIE-test failed to scientifically determine its efficacy and quality in an adequate way, thus research findings tied to it are questionable.

## 6. Implications

Regarding the findings in the present study there are several implications.

First, the HRV measures though not entirely reliable, proved to be effective as a manipulation check toward the test situation. That is, HRV measures can be used in addition to HR measures to indicate degree of experienced anxiety. In the world of sports, this can be applied when e.g., testing the effect of an imagery manuscript on pre competitive anxiety.

Second, the results in the present study increased the observation scheme's (Appendix D) credibility. Still, further testing and validation is recommended before employed in future studies.

Third, even though the findings did not solely support the imagery manuscript as the main cause of the results, in accordance with earlier research, athletes, coaches, physical education students and teachers can make use of the current manuscript (but preferably a personalized one) to reduce PSA.

Fourth, according to the interviews, none of the participants reported the factors toward being videotaped as contributing to increasing experienced anxiety, thus videotaping the participants may not be recommended as a mean to increase experienced anxiety in future studies.

Finally, holistically the present study can be considered as a pilot study illuminating pitfalls and possible improvements for future research in similar research areas.

## 7. Future research

Based on the study's findings, there are several suggestions to future research. For example, it would have been interesting and most likely fruitful to conduct a follow-up on the present study provided there being a correction of the limitations. However, to use the present study as a pilot, correcting the limitations and in addition making a few changes would probably be even more interesting and provide even more valuable information.

Regarding the additional changes, future studies should change the design to a Blind, pre-test post-test, randomized experimental design with a third group receiving placebo to secure a higher internal validity. Correspondingly a larger sample size should be recruited, thus opening up to more focus on quantitative data. *Two*, the findings in the present study are limited to PSA toward having a presentation in an auditorium. Therefore, to provide a deeper understanding, exploring the imagery manuscript's effectiveness in other situations would be favourable, and to explore the effectiveness in realistic situations such as e.g., when soccer coaches with PSA have press conferences, would be even more so. *Three*, future research should work on the personalization issue regarding the manuscript. Developing the manuscript in collaboration with the intervention group may be one way to solve it. *Four*, future research should focus on securing that each participant would have to present an unfamiliar case, like e.g., a new research article, since this could reduce the chance of participants feeling more secure in e.g., the pre-test than the post-test. According to the interviews in the present study, this could also secure a better or more similar preparation among the participants. *Five*, though it was not a problem in the present study, it could be that by securing a larger audience, greater differences between pre- and post-testing will show. *Six*, in line with previous research and the present study's interview results, a more applied introduction and instruction should be employed to increase the effect of imagery manuscripts. *Seven*, in addition to HRV that was used in the present study, future research could include cortisol as another objective measure to register physiological changes toward anxiety. Finally, during the study an observation scheme was developed. Even though the study's results increased the scheme's credibility, further testing to secure reliability and validity is needed, before it can be recommended for future studies.

## 8. Conclusion

As mentioned earlier, the present study investigated the effect of a “positive imagery manuscript based on the PETTLEP model”, on the degree of PSA. In short, the investigation implied: deriving three hypotheses, dividing six NIH students in one intervention group and one control group, having them pre- and post-tested, and measuring and analysing anxiety variables toward PSA that finally were discussed.

In support of hypothesis number 1, when compared with the control group, the intervention group’s HR results had a pronounced greater decrease from pre- to post-test. This finding is important since such development is considered to be equal to a decrease in experienced anxiety. Furthermore, in support of hypothesis number 2, the intervention group opposed to the control group had a pronounced more positive development in the IAMS results from pre- to post-test. On an individual level, a positive development in IAMS results can look quite different, but in any case, such results indicate a decrease in experienced anxiety, which emphasize the importance of the findings in the present study. Finally, the SIE-test results indicated a moderate imagery ability among the participants in the intervention group, the observations indicated a better improvement in the intervention group opposed to the control group, the logbooks revealed several factors that could explain the intervention group’s altogether moderate development, and the interview results were consistent with the HR and IAMS results, thus the results altogether supported hypothesis number 3 as well.

Even though all hypotheses were supported, the results can not solely be explained by the imagery manuscript. Through the interviews it became clear that there were multiple alternatives as to why the participants had a decrease in experienced anxiety, thus weakening the study’s internal validity. In conclusion, the results from the present study indicate that the imagery manuscript did reduce the intervention-participants’ PSA. On the other hand, since the interviews weakened the study’s internal validity, we can not conclude that the manuscript alone caused the results. However, as pointed out earlier, it might be that the participants gained something from the imagery manuscript without really knowing it, that is, the feeling of having done it before might have been intensified.

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## List of tables

<i>Table 1.1: Mean scores and SD for HR, HRV, IAMS and SIE at Baseline, Pre- and Post-test</i> .....	30
<i>Table 1.2: Difference in mean IAMS between Pre and Post in both groups</i> .....	32
<i>Table 1.3: Observations</i> .....	38
<i>Table 1.4: An overview of the interviews</i> .....	40



## List of figures

<i>Figure 1.1: An overview of the study.....</i>	20
<i>Figure 1.2: An overview of the test-procedure.....</i>	28
<i>Figure 1.3: Post intervention control, individual scores.....</i>	31
<i>Figure 1.4: Mean average HR in both groups at Baseline, Pre- and Post-test.....</i>	32
<i>Figure 1.5: Sport Imagery Evaluation-test, mean scores – Intervention group, Pre- and Post-test.....</i>	33
<i>Figure 1.6: HR scores on all participants at Baseline, Pre- and Post-test (n=6).....</i>	34
<i>Figure 1.7: IAMS PRE and POST scores on participant 01 and 05.....</i>	35
<i>Figure 1.8: Sport Imagery Evaluation-test, individual scores – Intervention group, Pre-test.....</i>	35

## Abbreviations

ANS	Autonomic Nervous System
BPM	Beats Per Minute
C	Control group
CA	Cognitive Anxiety
HF	High Frequency power (reflects parasympathetic components of the ANS)
HR	Heart Rate
HRV	Heart Rate Variability
I	Intervention group
IAMS	the Immediate Anxiety Measures Scale
LF	Low Frequency power (reflects sympathetic components of the ANS)
LF/HF %	LF/HF ratio (reflects changes between LF and HF)
NIH	Norges idrettshøgskole (Norwegian School of Sport Sciences)
NSD	Norsk Samfunnsvitenskapelig Datatjeneste
O1	Observer number 1
O2	Observer number 2
PETTLEP	Physical, Environment, Task, Timing, Learning, Emotion and Perspective
PPT	Power Point file
PSA	Public Speaking Anxiety
PT	Personal Trainer
RMSSD	Root Mean Square of Differences
SA	Somatic Anxiety
SC	Self-Confidence
SD1	Instantaneous beat-to-beat variability
SIE	the Sport Imagery Evaluation-test (also known as SIQ)
SIT	Stress Inoculation Training

## Appendix

### Appendix A: Visualiseringsmanuskript.

#### Retningslinjer:

- 1) Visualiseringsøktene skal foregå stående fra og med del 4.
- 2) Prøv å hovedsakelig visualiser internt. Det vil si at du visualiserer manuskriptet som om du ser det som skjer ut fra dine egne øyne. Det kan være lettere å visualisere med øynene lukket men dette er valgfritt.
- 3) Visualiseringsøkten skal utføres i normal hastighet. Det vil si at du ikke skal se i fortfilm eller saktefilm.
- 4) Prøv å hold øktene på ca. 6 minutters varighet (lydsporet x 2, eller lese x 2)
- 5) Når du føler at du husker hele manuskriptet og føler at du kan gjennomføre selve visualiseringsøkten uten manus eller lydfil, er det mulighet for å gjøre dette. Hør gjerne på lydfilen av og til for å ikke glemme detaljer.

#### Manuskriptet

- 1) Du sitter i auditoriet blant mange studenter og det snakkes høylytt. Du har akkurat trukket temaet som skal presenteres, og kjenner at det kribler i magen på en god måte. Smilet kommer raskt. Dette gleder du deg til (***tenk tilbake til noe du har gledet deg til eller som har gjort deg spesielt glad. Knytt så følelsen du hadde da, til det at du nå skal ha et foredrag***).
- 2) Smaken på tyggisen begynner å forsvinne. Du er hjemme og har nå en uke på deg til å forberede foredraget du skal ha. Musikken summer i bakgrunnen mens du koser deg med en kopp varmt drikke. Du legger mye jobb i forberedelsene og dagen før foredraget føler du at du har full kontroll. Baken kjennes faktisk litt øm etter å ha sittet mye foran datamaskinen. Du vet at det kommer til å bli et vellykket foredrag, der alle kommer til å følge nøye med for å få med seg alt. Du er heller ikke i tvil om at dette er noe du virkelig kan godt. Lukten av herlig nybakt eplekake kommer plutselig imot deg samtidig som du kjenner vinden blåse rolig inn gjennom vinduet på rommet.

3) Dagen er kommet og du sitter i auditoriet og venter på at det skal bli din tur. Salen er nesten full av spente tilskuere som gleder seg til å se foredraget ditt. Det lukter fantastisk parfyme av noen i nærheten, og foredraget som skal holdes før deg er nå igang. Du følger nøye med på hva som blir sagt, samtidig som du gleder deg til at det skal bli din tur. Du er fullstendig avslappet (***tenk tilbake til en gang du følte deg veldig avslappet og knytt den følelsen opp mot det å holde foredrag***). Hendene dine føles helt normale og kroppen har akkurat passe temperatur. Du puster rolig inn og ut gjennom nesen og hjertet slår rolig. Du er fullstendig avslappet samtidig som smilet titter frem.

4) Foredraget avsluttes og det er nå din tur. Endelig er det du som skal få være i sentrum for en liten stund. Med en god holdning og smilet fortsatt på plass går du opp til podiet. Du føler deg fullstendig avslappet og klar til å formidle det du kan. Alle øyne ser interessert på deg og hver eneste ting du gjør, noe som gjør deg enda mer selvsikker. Publikum vil ikke gå glipp av et eneste sekund. Du kjenner at munnen er passe fuktet av halspastillen og hendene er fortsatt som de skal være.

5) Du begynner å snakke og stemmen din er selvsikker, klar og tydelig. Foredraget går som en drøm. Du har 100 % kontroll, noe som alle i publikum kan både se og høre! Publikum stiller flere spørsmål de siste 5 minuttene av foredraget og de fleste av dem svarer du på uten problem. Spørsmålene du ikke har svar på takler du fint ved å bare si at du dessverre ikke kan svare på akkurat det, før du så går videre med presentasjonen. Helt til slutt runder du av foredraget og takker for deg, før du så mottar en rungende applaus.

## **Appendix B: Forespørsel om deltakelse i masterstudie.**

Hei kjære student! Jeg holder på med en mastergrad innenfor idrettspsykologi ved Norges idrettshøgskole (NIH) og skal i den forbindelse gjøre en studie. Studien vil være eksperimentell og går ut på å teste en metode som skal gjøre deg bedre egnet til å takle press (stress) i ulike situasjoner, der målet er å undersøke hvor effektiv denne metoden er.

Det er frivillig å delta og det er mulig å trekke seg fra denne studien når som helst uten noen konsekvenser. Du trenger ikke oppgi noen grunn for å trekke deg. Den forventede fordelene med å delta er at du vil lære en metode som vil gjøre deg bedre egnet til å takle press (stress) i ulike situasjoner i fremtiden. Den forventede ulempen ved å delta er at du mest sannsynlig vil oppleve ulike former for stress under testsituasjonene.

### **Inklusjonskriterie:**

Dersom du ønsker å delta i denne studien må du kjenne deg igjen i noen av følelsene eller tankene (eventuelt noen fra begge) som er oppsummert nedenfor. Tankene og følelsene er her relatert til det å snakke foran en et publikum (eksempel: lagkamerater, familieselskap eller medstudenter). Eks: tenk deg at du skal holde en presentasjon for klassen eller en tale i et stort familieselskap.

### **Følelser:**

- 1) Ubehagelige sommerfugler i magen
- 2) Økt svetting
- 3) Tørr munn
- 4) Fomle med ord
- 5) Eller andre følelser i samme kategori

### **Negative tanker:**

- 1) Jeg kommer til å gjøre noe feil
- 2) Publikum ser at jeg er nervøs
- 3) Publikum kommer til å le av meg hvis jeg sier noe feil
- 4) Jeg kommer ikke til å klare å svare på alle spørsmålene fra publikum
- 5) Eller andre negative tanker i samme kategori

Det vil bli utført to runder med testing der det forventes at du kan sette av ca. 2 timer for hver gang. Data vil bli innsamlet gjennom mål av hjertefrekvens, hjerterate variabilitet, intervju, observasjon og spørreskjemaer som skal fylles ut. Innsamlet data vil avgjøre hvor effektiv metoden er. I henhold til NIH's retningslinjer vil dataene bli lagret trygt og uforandret i ti år, for så å bli slettet for godt. Dette er standard prosedyre ved NIH for å sikre mulighet for de som måtte ønske å etterprøve studien eller gjøre oppfølgingsstudier. Det vil ikke være aktuelt å kontakte deg eller noen av de andre forsøkspersonene i etterkant av studien for nye studier.

Personopplysninger (innsamlet data) vil være sikret gjennom aidentifisering av opplysningene. Datasettet med opplysninger vil være knyttet til en nøkkel, og det er da kun personen (daglig leder) med tilgang til nøkkelen som har tilgang til personopplysningene. Nøkkelen og datasettet vil være separert til enhver tid.

Prosjektet er godkjent av Norges Samfunnsvitenskapelig Datatjeneste (NSD).

Med vennlig hilsen

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(prosjektleder)

Klipp her

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**Samtykkeerklæring.**

Jeg har fått både skriftlig og muntlig informasjon om studien og er villig til å delta.

Navn (blokkbokstaver):

Signer Sted Dato

## Appendix C: Immediate Anxiety Measures Scale (IAMS).

### Viktige instruksjoner.

Det å holde en presentasjon kan føre til engstelse hos mange. Vi skiller mellom kognitiv og somatisk engstelse. Det følgende spørreskjemaet ber deg om å vurdere hvor stor kognitiv (den mentale) engstelse du har, hvor stor somatisk (den kroppslige) engstelse du har, og i hvor stor grad du føler deg selvsikker i forhold til tre ulike uttalelser. For at du skal kunne vurdere uttalelsene så nøyaktig som mulig skal du ta hensyn til følgende definisjoner:

**Kognitiv engstelse:** er den mentale komponenten av angst og kan forstås som bekymringsfulle tanker rundt det å for eksempel holde en presentasjon. Eks: Man kan tenke at man er redd for å dumme seg ut, eller at publikum synes man er kjedelig.

**Somatisk engstelse:** er din opplevde fysiske tilstand i forhold til det å for eksempel holde en presentasjon. Eks: sommerfugler i magen, tørr munn, skjelvende stemme, klamme hender osv.

**Selvsikkerhet:** handler om hvor selvsikker/trygg du er i forhold til det å for eksempel holde en presentasjon. Eks: Du kan føle deg veldig selvsikker frem mot en presentasjon, for så å bli lite selvsikker oppe på podiet.

**Retningsoppfattelse:** forteller om du oppfatter; kognitiv og somatisk engstelse, og selvtillit, som positivt eller negativt i forhold til det å for eksempel holde en presentasjon.

**Hypighet:** tilsvarer her ”hvor ofte” du opplever symptomene til kognitiv og somatisk engstelse, og selvtillit akkurat nå.

### Deltakernummer:

## The Immediate Anxiety Measures Scale (IAMS) (bearbejdet).

**Instruksjoner:** Nedenfor ser du tre uuttalelser som reflekterer mulige tanker og følelser tilknyttet det å holde en presentasjon. Først skal du vurdere i hvilken **grad** du opplever kognitiv og somatisk engstelse og selvtillit; Deretter skal du vurdere graden av den kognitive og somatiske engstelsen og selvtilliten som **negativ** eller **positiv** i forhold til din kommende presentasjon;

Til slutt skal du vurdere hvor **hyppig** du opplever den kognitive og somatiske engstelsen og selvtilliten. Les hver uttalelse nøye før du ringer av for hvordan du føler det **akkurat nå**.

	I hvilken grad?							Ser du på det som positivt eller negativt?							Hvor hyppig?											
	Ingen	1	2	3	4	5	6	7	Ekstrem	Veldig negativ	-3	-2	-1	0	+1	+2	+3	Veldig positivt	Aldri	1	2	3	4	5	6	7
<b>Uttalelse 1:</b> Jeg føler kognitiv engstelse	1	2	3	4	5	6	7			-3	-2	-1	0	+1	+2	+3			1	2	3	4	5	6	7	
<b>Uttalelse 2:</b> Jeg føler somatisk engstelse	1	2	3	4	5	6	7			-3	-2	-1	0	+1	+2	+3			1	2	3	4	5	6	7	
<b>Uttalelse 3:</b> Jeg føler selvsikkerhet	1	2	3	4	5	6	7			-3	-2	-1	0	+1	+2	+3			1	2	3	4	5	6	7	



## Appendix D: Observasjonsskjema.

<i>Atferd:</i>	<i>Huk av + kommentar.</i>
Fomler/mumler med ord	
Sier "eeeh"	
Fikler med noe	
Skjelver i hendene	
Står urolig	
Ser mye på manus/powerpoint	
Rødmer	
Står på samme sted	
Leser rett av manus/powerpoint	
Skjelvende stemme	

**Variabel:** Public Speaking Anxiety (Cozby, 1993).

### Operasjonaliserte definisjoner – kodingssystem (Cozby, 1993).

<i>Atferd:</i>	<i>Operasjonalisering:</i>
Fomler/mumler med ord	Stokkete og/eller uklar uttale.
Sier "eeeh"	I stedet for å ikke si noe der det vanligvis er naturlige pauser, fyller deltakeren pausene med å si "eeeh".
Fikler med noe	Tar på eller håndterer noe mye, eks: en laserpeker.
Skjelver i hendene	Hendene rister ukontrollert.
Står urolig	Unaturlig mye bevegelse i armer og/eller bein.
Ser mye på manus/powerpoint	Har hodet ofte vendt mot manus/powerpoint. Dette kan være tegn på at deltakeren ønsker å unngå øyekontakt med publikum.
Rødmer	Blir rød i ansiktet.
Står på samme sted	Holder seg innenfor ca. 0,5m radius.
Leser rett av manus/powerpoint	Legger ikke til noe eller lite informasjon, eller er veldig knyttet til manus/powerpoint.
Skjelvende stemme	Deltakeren har urolig/skjelvende stemme når hun/han snakker.

## **Appendix E: Post-Intervensjonskontroll.**

**1) Var det vanskelig å relatere til manuskriptet?**

(1 = veldig vanskelig, 7 = ikke i det hele tatt)

**2) Var det vanskelig å visualisere?**

(1 = veldig vanskelig, 7 = ikke i det hele tatt)

**3) Var manuskriptet meningsfylt for deg?**

(1 = ikke meningsfylt i det hele tatt, 7 = veldig meningsfylt)

**4) Hvordan følte du eventuelle emosjoner?**

(1 = veldig svakt, 7 = veldig sterkt)

**5) I hvilken grad fant du manuskriptet hjelpsomt/ikke hjelpsomt?**

(1 = ikke hjelpsomt i det hele tatt, 7 = veldig hjelpsomt)

## Appendix F: The Sport Imagery Evaluation-test (SIE).

God visualisering forutsetter at vi tar i bruk sansene for å gjøre visualiseringen så virkelighetsnær som mulig. En visualiseringsøkt skal være detaljert og bør derfor inneholde opplevde følelser (både emosjonelle og fysiske), smaker, lukter, lyder og visuelle bilder i forhold til situasjonen som skal visualiseres. Evnen til å visualisere varierer fra person til person og denne testen er ment for å kartlegge din visualiseringsevne.

Det vil nå bli lagt frem 4 ulike situasjoner som skal visualiseres på to forskjellige måter. Først prøv å visualiser slik at du ser deg selv som på en film (G = eksternt). Prøv deretter å visualiser som om du skulle sett situasjonen ut fra dine egne øyne (H = internt). Ta deg god tid til å visualisere. Til hver situasjon skal visualiseringen vurderes i forhold til 9 ulike påstander (A-I). Påstandene skal på siste side i dette skjema vurderes ut fra følgende skala:

1 = i veldig liten grad

2 = i liten grad

3 = moderat

4 = i stor grad

5 = i veldig stor grad

### 1. Situasjon: Trekking av tema

Du er i klasserommet og venter på å trekke tema for presentasjonen du skal holde neste uke. Vinduene er på vidt gap og du kjenner lukten av høst samtidig som du merker at du fryser litt. Kakaokoppen går fort ned og hjelper heldigvis litt på kulden. De andre studentene er urolige og det er mye snakking. Plutselig er det din tur. Du reiser deg opp og går sakte opp mot pulten der oppgavene ligger. Du trekker en lapp og kjenner det kribler i magen.

A. Visualiseringen var livaktig/virkelighetsnær.

B. Du **følte** (fysisk) det du gjorde.

C. Du opplevde **smaker**.

D. Du opplevde **lyder**.

- E. Du opplevde **følelser** (emosjonelle).
- F. Du opplevde **lukter**.
- G. Du så deg selv som på en film under visualiseringen.
- H. Du så som om du skulle sett ut av dine egne øyne under visualiseringen.
- I. Du hadde kontroll over visualiseringen.

## 2. Situasjon: Forberedelse

Du legger mye jobb i forberedelsene sammen med flere kopper kaffe. Musikken summer rolig i bakgrunnen mens du jobber med PowerPoint'en. På slutten av forberedelsene øver du både på tale og kroppsspråk. Dagen før foredraget sitter du hjemme med en følelse av kontroll. Plutselig ringer det på døra. Peppes kommer endelig med pizzaen og hele leiligheten fylles med den herlige lukten.

- A. Visualiseringen var livaktig/virkelighetsnær.
- B. Du **følte** (fysisk) det du gjorde.
- C. Du opplevde **smaker**.
- D. Du opplevde **lyder**.
- E. Du opplevde **følelser** (emosjonelle).
- F. Du opplevde **lukter**.
- G. Du så deg selv som på en film under visualiseringen.
- H. Du så som om du skulle sett ut av dine egne øyne under visualiseringen.
- I. Du hadde kontroll over visualiseringen.

## 3. Situasjon: Ventetid

Det kommer en overveldende lukt av parfyme fra noen i nærheten. Du sitter i forelesningssalen blant mange medstudenter og tyggisen din begynner å gå tom for smak. Tre presentasjoner er allerede holdt og nummer fire er godt igang. Du følger nøye med på hva nummer fire forteller, samtidig som du venter i spenning. Straks er det din tur.

- A. Visualiseringen var livaktig/virkelighetsnær.
- B. Du **følte** (fysisk) det du gjorde.
- C. Du opplevde **smaker**.
- D. Du opplevde **lyder**.

- E. Du opplevde **følelser** (emosjonelle).
- F. Du opplevde **lukter**.
- G. Du så deg selv som på en film under visualiseringen.
- H. Du så som om du skulle sett ut av dine egne øyne under visualiseringen.
- I. Du hadde kontroll over visualiseringen.

#### 4. Situasjon: Showtime

Presentasjonen til personen før deg avsluttes. Nå er det din tur. Med en god holdning og et smil om munnen går du sakte men sikkert opp til podiet. Alle øyne ser interessert på deg og hver eneste ting du gjør. Publikum går ikke glipp av et eneste sekund. Du kjenner smaken og lukten av halspastillen du tok for noen minutter siden. It's showtime! Du begynner å snakke.

- A. Visualiseringen var livaktig/virkelighetsnær.
- B. Du **følte** (fysisk) det du gjorde.
- C. Du opplevde **smaker**.
- D. Du opplevde **lyder**.
- E. Du opplevde **følelser** (emosjonelle).
- F. Du opplevde **lukter**.
- G. Du så deg selv som på en film under visualiseringen.
- H. Du så som om du skulle sett ut av dine egne øyne under visualiseringen.
- I. Du hadde kontroll over visualiseringen.

**Før opp resultatene dine i skjemaet nedenfor:**

	1. Situasjon	2. Situasjon	3. Situasjon	4. Situasjon	<b>SUM:</b>
A: bilde					
B: følelse					
C: smak					
D: lyd					
E: emosjon					
F: lukt					
G: eksternt					
H: internt					
I: kontroll					

(Pensgaard & Hollingen, 1996; Vealey & Greenleaf, 2006).

## **Appendix G: Intervjuguide - intervensjonsgruppen.**

### ***Innledning (5min)***

- Sender dere utkast. Dere bestemmer hva jeg kan ha med og ikke!
- Alle er sikret anonymitet gjennom bruk av nummer, pseudonym eller ikke noe.
- Alt i selve oppgaven vil bli oversatt til engelsk.
- Jeg går så igjennom hovedtemaene i intervjuet med informanten.
- Spør så om det høres greit ut og om informanten lurer på noe.
- Opptaket startes.

### ***Innledende spørsmål:***

- 1) Hvordan synes du det har vært å være med i dette prosjektet?
- 2) Hvordan erfaring hadde du med visualisering før du ble med i dette prosjektet?
- 3) Har du prøvd andre metoder enn visualisering for å bli kvitt ubehaget du føler i forbindelse med å holde presentasjoner? I så fall hvilken/hvilke?

### ***Nøkkelsspørsmål (45min):***

#### **Kartlegging:**

- 1) Hvis du tenker tilbake, kan du da huske første gang du hadde en ubehagelig opplevelse i forbindelse med å snakke foran et publikum? Hva skjedde og hvor gammel var du?
- 2) Vil du si at ubehaget du følte den gangen kan sammenliknes med det ubehaget du har følt i liknende situasjoner i ettertid?
- 3) Hva slags tanker er/har vært knyttet til ubehaget?
- 4) Hva slags følelser er/har vært knyttet til ubehaget?
- 5) Du har nå beskrevet tankene og følelsene dine. Hva tror du så er grunnen til at du tenker og føler det du gjør?
- 6) Har du noen gang hatt et/eller flere foredrag (i etterkant av den første opplevelsen du husker) der du har følt at andre har gjort narr av deg eller fått deg til å føle at du ikke har gjort en bra jobb? Hvis ja, hva skjedde?
- 7) Hvordan ønsker du å oppleve (tanker og følelser) det å holde presentasjoner?

#### **For-test:**

- 1) Følte du noe ubehag i løpet av for-testen, og når var det eventuelt værste?
- 2) Hva slags følelser hadde du når ubehaget var på det værste?
- 3) Hva slags tanker hadde du når ubehaget var på det værste?
- 4) Ble noen av tankene bekreftet i løpet av for-testen? Hvis ja, hvilke?
- 5) Hvordan følte du at foredraget gikk sånn generelt?
- 6) Tror du at publikum kunne se at du hadde det ubehagelig før eller i løpet av presentasjonen? Hvis ja, hva tror du at de la merke til?

### **Etter-test:**

- 1) Følte du noe ubehag under etter-testen, og når var det eventuelt værst?
- 2) Hva slags følelser hadde du når ubehaget var på det værste?
- 3) Hva slags tanker hadde du når ubehaget var på det værste?
- 4) Ble noen av tankene bekreftet i løpet av etter-testen? Hvis ja, hvilke?
- 5) Hvordan følte du at foredraget gikk sånn generelt?
- 6) Tror du at publikum kunne se at du hadde det ubehagelig før eller i løpet av presentasjonen? Hvis ja, hva tror du at de la merke til?
- 7) Hvordan forberedte du deg til etter-testen i forhold til for-testen?

### **Testsituasjonene:**

- 1) Hvordan påvirket det deg at du ble filmet under presentasjonene?
- 2) Du fikk i begynnelsen av prosjektet beskjed om at presentasjonene dine i etterkant ville bli vurdert og analysert av profesjonelle foredragsholdere ved NIH. Hvordan vil du si at dette påvirket deg under testsituasjonene (minikonferansene)?
- 3) Hva hadde det å si for deg at presentasjonene i ettertid skulle legges ut på intranettet (åpent for alle ved NIH) på skolen?
- 4) Følte du at testsituasjonene var ekte eller var du veldig bevisst på at dette bare var forsøk tilknyttet et prosjekt?

### **Metoden:**

- 1) Du fikk for kort tid siden bruke et positivt visualiseringsmanuskript i 5 uker. Hva føler du at manuskriptet har gjort for deg?
- 2) Er det sånn at du vil fortsette å bruke visualiseringsmanuskriptet ved behov i ettertid? Hvis ja, hvorfor?
- 3) Ville du ha anbefalt visualiseringsmanuskriptet til andre som føler ubehag når de skal holde presentasjoner? Hvis ja, hvorfor?
- 4) Hvis du kunne ha forandret manuskriptet, hva ville du ha forandret og hvorfor?
- 5) Etter du fikk vite hva metoden var, trodde du da at intervensjonen ville komme til å redusere ditt opplevde ubehag? Hvis ja, hvorfor? Hvis nei, hvorfor ikke?
- 6) Hvordan opplevde du introduksjonen til visualisering?

### ***Oppsummering (5min)***

- En kort oppsummering av funnene!
- Har jeg ut ifra det jeg akkurat oppsummerte forstått deg riktig?
- Har du noen spørsmål eller noe som du vil legge til?
- Opptaket avsluttes.
- Jeg takker for hjelpen og samarbeidet!

## **Appendix H: Intervjuguide - kontrollgruppen.**

### ***Innledning (5min)***

- Sender dere utkast. Dere bestemmer hva jeg kan ha med og ikke!
- Alle er sikret anonymitet gjennom bruk av nummer, pseudonym eller ikke noe.
- Alt i selve oppgaven vil bli oversatt til engelsk.
- Jeg går så igjennom hovedtemaene i intervjuet med informanten.
- Spør så om det høres greit ut og om informanten lurer på noe.
- Opptaket startes.

### ***Innledende spørsmål:***

- 1) Hvordan synes du det har vært å være med i dette prosjektet?
- 2) Har du prøvd noen metoder for å bli kvitt ubehaget du føler i forbindelse med å holde presentasjoner? I så fall hvilken/hvilke?

### ***Nøkkelsspørsmål (45min):***

#### **Kartlegging:**

- 1) Hvis du tenker tilbake, kan du da huske første gang du hadde en ubehagelig opplevelse i forbindelse med å snakke foran et publikum? Hva skjedde og hvor gammel var du?
- 2) Vil du si at ubehaget du følte den gangen kan sammenliknes med det ubehaget du har følt i liknende situasjoner i ettertid?
- 3) Hva slags følelser er/har vært knyttet til ubehaget?
- 4) Hva slags tanker er/har vært knyttet til ubehaget?
- 5) Du har nå beskrevet tankene og følelsene dine. Hva tror du er grunnen til at du tenker og føler det du gjør?
- 6) Har du noen gang hatt et/eller flere foredrag (i etterkant av den første opplevelsen du husker) der du har følt at andre har gjort narr av deg eller fått deg til å føle at du ikke har gjort en bra jobb? Hvis ja, hva skjedde?
- 7) Hvordan ønsker du å oppleve (tanker og følelser) det å holde presentasjoner?

#### **For-test:**

- 1) Følte du noe ubehag i løpet av for-testen, og når var det eventuelt værst?
- 2) Hva slags følelser hadde du når ubehaget var på det værste?
- 3) Hva slags tanker hadde du når ubehaget var på det værste?
- 4) Ble noen av tankene bekreftet i løpet av for-testen? Hvis ja, hvilke?
- 5) Hvordan følte du at foredraget gikk sånn generelt?
- 6) Tror du at publikum kunne se at du hadde det ubehagelig før eller i løpet av presentasjonen? Hvis ja, hva tror du at de la merke til?



**Etter-test:**

- 1) Følte du noe ubehag under etter-testen, og når var det eventuelt værst?
- 2) Hva slags følelser hadde du når ubehaget var på det værste?
- 3) Hva slags tanker hadde du når ubehaget var på det værste?
- 4) Ble noen av tankene bekreftet i løpet av etter-testen? Hvis ja, hvilke?
- 5) Hvordan følte du at foredraget gikk sånn generelt?
- 6) Tror du at publikum kunne se at du hadde det ubehagelig før eller i løpet av presentasjonen? Hvis ja, hva tror du at de la merke til?
- 7) Var du like godt forberedt til etter-testen som for-testen?

**Testsituasjonene:**

- 1) Hvordan påvirket det deg at du ble filmet under presentasjonene?
- 2) Du fikk i begynnelsen av prosjektet beskjed om at presentasjonene dine i etterkant ville bli vurdert og analysert av profesjonelle foredragsholdere ved NIH. Hvordan vil du si at dette påvirket deg under testsituasjonene (minikonferansene)?
- 3) Hva hadde det å si for deg at presentasjonene i ettertid skulle legges ut på intranettet (åpent for alle ved NIH) på skolen?
- 4) Følte du at testsituasjonene var ekte eller var du veldig bevisst på at dette bare var forsøk tilknyttet et prosjekt?

**Metoden:**

- 1) Hvordan opplevde du å ikke få være med i intervensjonsgruppen?

***Oppsummering (5min)***

- En kort oppsummering av funnene!
- Har jeg ut ifra det jeg akkurat oppsummerte forstått deg riktig?
- Har du noen spørsmål eller noe som du vil legge til?
- Opptaket avsluttes.
- Jeg takker for hjelpen og samarbeidet!

## Appendix I: Logg.

**Nummer:**

**Uke:**

I loggen skal det skrives en kort oppsummering fra hver visualiseringsøkt. Eksempelvis: gikk det greit å holde seg konsentrert? Hvor lang tid brukte du på å gjennomføre økten? Hvordan følte du deg i starten, under og på slutten av visualiseringen? Hvor mange ganger hørte du på lydsporet? Klarte du å se for deg hele manuset? Var det rolig rundt deg under økten? Noen problemer? Annet?

	<b>Dato:</b>	<b>Kl:</b>	<b>Bemerkninger/tidsbruk</b>
<b>MANDAG</b>			
<b>TIRSDAG</b>			
<b>ONSDAG</b>			
<b>TORS DAG</b>			
<b>FREDAG</b>			
<b>LØRDAG</b>			
<b>SØNDAG</b>			

# Appendix J: NSD.

Norsk samfunnsvitenskapelig datatjeneste AS  
NORWEGIAN SOCIAL SCIENCE DATA SERVICES



Harald Hårfagres gate 29  
N-5007 Bergen  
Norway  
Tel: +47-55 58 21 17  
Fax: +47-55 58 96 50  
nsd@nsd.uib.no  
www.nsd.uib.no  
Org.nr. 985 321 884

Anne Marte Pensgaard  
Seksjon for coaching og psykologi  
Norges idrettshøgskole  
Postboks 4014 Ullevål stadion  
0806 OSLO

Vår dato: 29.12.2010

Vår ref: 25325 / 3 / AMS

Deres dato:

Deres ref:

## TILRÅDING AV BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 21.10.2010. All nødvendig informasjon om prosjektet forelå i sin helhet 15.12.2010. Meldingen gjelder prosjektet:

25325	<i>Imagery – A Way to lower your Speech Anxiety</i>
Behandlingsansvarlig	Norges idrettshøgskole, ved institusjonens øverste leder
Daglig ansvarlig	Anne Marte Pensgaard
Student	Fredrik Bergseteren

Personvernombudet har vurdert prosjektet, og finner at behandlingen av personopplysninger vil være regulert av § 7-27 i personopplysningsforskriften. Personvernombudet tilrår at prosjektet gjennomføres.

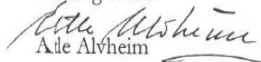
Personvernombudets tilråding forutsetter at prosjektet gjennomføres i tråd med opplysningene gitt i meldeskjemaet, korrespondanse med ombudet, eventuelle kommentarer samt personopplysningsloven/-helseregisterloven med forskrifter. Behandlingen av personopplysninger kan settes i gang.

Det gjøres oppmerksom på at det skal gis ny melding dersom behandlingen endres i forhold til de opplysninger som ligger til grunn for personvernombudets vurdering. Endringsmeldinger gis via et eget skjema, [http://www.nsd.uib.no/personvern/forsk\\_stud/skjema.html](http://www.nsd.uib.no/personvern/forsk_stud/skjema.html). Det skal også gis melding etter tre år dersom prosjektet fortsatt pågår. Meldinger skal skje skriftlig til ombudet.

Personvernombudet har lagt ut opplysninger om prosjektet i en offentlig database, <http://www.nsd.uib.no/personvern/prosjektoversikt.jsp>.

Personvernombudet vil ved prosjektets avslutning, 28.05.2011, rette en henvendelse angående status for behandlingen av personopplysninger.

Vennlig hilsen

  
Aile Alvhøim

  
Anne-Mette Somby

Kontaktperson: Anne-Mette Somby tlf: 55 58 25 83  
Vedlegg: Prosjektvurdering  
Kopi: Fredrik Bergseteren, Nils Bays vei 82, 0855 OSLO

Avdelingskontorer / District Offices:

OSLO: NSD, Universitetet i Oslo, Postboks 1055 Blindern, 0316 Oslo. Tel: +47-22 85 52 11. [nsd@uio.no](mailto:nsd@uio.no)  
TRONDHEIM: NSD, Norges teknisk-naturvitenskapelige universitet, 7491 Trondheim. Tel: +47-73 59 19 07. [kyrre.svarva@svt.ntnu.no](mailto:kyrre.svarva@svt.ntnu.no)  
TROMSØ: NSD, SVF, Universitetet i Tromsø, 9037 Tromsø. Tel: +47-77 64 43 36. [nsdmaa@sv.uit.no](mailto:nsdmaa@sv.uit.no)

## Personvernombudet for forskning



### Prosjektvurdering - Kommentar

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Prosjektnr: 25325

Utvalget skal bestå av 20 studenter ved Norges idrettshøgskole. Førstegangskontakt opprettes av studenten. Studien har et eksperimentelt design og kan medføre noe ubehag for deltakerne. I følge e-post fra studenten 14. desember har REK gitt tilbakemelding om at prosjektet ikke skal godkjennes av dem. Personvernombudet legger til grunn at de etiske aspektene ved prosjektet er ivarettatt gjennom veiledning og/eller interne retningslinjer ved institusjonen.

Det skal gis skriftlig informasjon og innhentes skriftlig samtykke fra deltakerne. Informasjonsskrivet mottatt 15. desember vurderes som tilfredsstillende utformet med tanke på vilkåret om informert samtykke.

Datamaterialet skal lagres aidentifisert på studentens private bærbare pc. Det er kun veileder som skal ha tilgang til koplingsnøkkelen.

Prosjektslutt er angitt til 28. mai 2011. Etter prosjektslutt skal datamaterialet lagres ved Norges idrettshøgskole i ti år for mulig etterprøving eller oppfølgingsstudier. Utvalget samtykker til at oppfølgingsstudier kan gjennomføres uten at de blir kontaktet på nytt. Etter ti år skal datamaterialet anonymiseres. Anonymisering vil innebære å slette direkte personidentifiserende opplysninger.

Personvernombudet minner om at oppfølgingsstudier må meldes på vanlig måte.

## **Appendix K: Deltakerinformasjon.**

- 1) Hvilken linje og hvilket år går du på NIH?**
- 2) Ser du på deg selv som dårlig, godt eller veldig godt trent?**
- 3) Røyker eller snuser du?**
- 4) Har du noen sykdom som du tror kan påvirke pulsmålingene?**
- 5) Går du på noen medisiner som du tror kan påvirke pulsmålingene?**
- 6) Deltar du aktivt i en idrett? I så fall hvilken?**





