Qigong: Acute affective responses
"Qigong and emotion/mood".
Mattias Johansson

Qigong: Acute affective responses in a group of regular exercisers
ABSTRACT

Qigong is a Chinese mind-body therapy that aims to, through the use of movements, relaxed breathing and relaxation/meditation, create a healthy flow of life force, qi, in the body, and consequently improve health. A growing number of Qigong studies report beneficial effects on health and well-being. However, little attention has focused on the acute affective responses that accompany single sessions of Qigong exercise. The aim of the present thesis was therefore to study affective reactions to Qigong exercise. In Study I, the effects of Qigong exercise on mood and anxiety were compared to a control group. Results showed partial support for the superiority of Qigong exercise compared to controls. In Study II, different lengths of session time were compared, resulting in similar affective benefits for the 30 and 60-minute sessions. In Study III, affective responses were also assessed during the session, using mean scores and individual responses. Results showed an increase toward greater Activated and Deactivated Pleasantness during the session, with the greatest changes at the end of the bout. The majority of individuals reported increased Pleasantness during the Qigong session. Expectations of positive outcomes were significantly associated with only few affective responses. Responses to open-ended questions of affective experiences displayed affective reactions mostly toward greater Deactivated Pleasantness. This thesis contributes to a greater understanding of the limited area of Qigong-related affective responses. For the exercisers, Qigong is associated with a greater momentary emotional state. However, due to the highly select group of regular Qigong exercisers, generalizing the results outside the sample population is limited. Theories on active mechanisms in the Qigong-affect relationship, and results from studies of affective responses to similar activities, suggest that other groups of people would also benefit affectively from Qigong exercise. Given the many benefits of positive affect, Qigong exercise may also pose great promises for the enhancement of other areas related to health and well-being. This calls for additional studies.

Key words: Qigong, affective responses, mind-body therapy, low-intensive physical activity, affect regulation
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Writing a doctoral thesis is like climbing a mountain. Starting out easily, it then gradually becomes steeper and more difficult, until you are finally standing on top of the mountain. You sit down and feel proud of yourself, having managed to reach the top. Then you look up and see that what you thought was the top of the mountain was just a cliff, and that the mountain continues further and further up into the sky. So you have to keep on climbing… During my years of PhD work, there have been hardships and struggles, followed by times of accomplishments and relaxation, then again followed by new difficult challenges… These cycles are repeated (like in all parts of life), but gradually it does get easier – you find new tools that simplify the tasks, and the times of struggle don’t last as long as they used to. Having reached one of the tops (still not aware of the next top!), I feel proud and satisfied. But no matter whether you choose to climb a mountain or write a PhD thesis, you always need friends and colleagues who support and encourage you to keep going. Without them, the task would be nearly impossible and much less fun.

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The thesis is based on the following three studies, which are referred to in the text by their Roman numerals:


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> SVENSK SAMMANFATTNING AV AVHANDLINGEN

Qigong är en kinesisk kroppsrörelse och meditationsform (mind-body therapy) som har utövats i årtusenden för dess hälsofrämjande effekter. Qi kan översättas med livskraft och gong med arbete. Grundprinciperna för qigong är att genom avspänning och naturlig andning fokusera på och inhämta qi (livskraft) till kroppens alla delar, och få till stånd ett hälsoamt flöde av qi. Många människor upplever positiva effekter i samband med qigongträning.

Sedan några årtionder har qigong blivit föremål för ökat intresse från forskningsvärlden. Trots att vissa studier lider av bristande vetenskaplig kvalitet ökar antalet studier av god kvalitet. Den samlade forskningen pekar på hälsofrämjande effekter inom områden som stresshantering, ökad livskvalitet, känslomässig balans, en förbättrad förmåga att hantera negativa symtom av och leva med kronisk sjukdom, samt ökad motståndskraft vid sjukdom.

Även om forskningen på qigong ökar har studier av akuta känslomässiga effekter av enstaka qigongpass varit få. Det affektiva området inkluderar emotioner, sinnesstämningar och känslor, dvs. känslomässiga reaktioner. Mer kunskap om aktiviteter som får människor att må bra är av stor vikt då många människor lider av såväl fysisk som psykisk ohälsa. Även om ökat känslomässigt välmående i stunden är viktigt i sig, klingar känslomässiga reaktioner efter ett tag av. Det har emellertid visats att personer som regelbundet aktiverar sig också kan få mer långvariga effekter. Ett positivt känslomässigt tillstånd påverkar exempelvis hur vi ser på oss själva och livet i stort. Vi tolkar omgivningen mer positivt, minns fler positiva minnen och möter oss själva och andra mer positivt. Positiva känslotillstånd kan också göra att negativa fysiologiska reaktioner i samband med stress och negativa känslor snabbare klingar av. Känslomässiga effekter som är kopplade till en viss aktivitet påverkar också om vi väljer att fortsätta att engagera oss i aktiviteten.

Syftet med avhandlingen var att studera känslomässiga reaktioner av enstaka qigongpass. Studiedeltagarna rekryterades i samband med qigongläger; majoriteten var högutbildade medelålders (55 år) kvinnor som under några år regelbundet tränat qigong. I Studie I, var syftet att jämföra effekterna av ett enstaka qigongpass med en
kontrollgrupp som fick lyssna på ett föredrag av grundaren av Biyunmetoden (självskattningsskalan Profile of Mood States, POMS, och state-versionen av State and Trait Anxiety Inventory, STAI användes). Resultatet visade att oro/ängslan, depression, ilska och utmattning minskade signifikant i qigonggruppen jämfört med kontrollgruppen. Denna skillnad var dock inte synlig i självskattad spändhet, förvirring och vigör. Att jämföra känslotillståndet efter qigong med det efter ett föredrag av grundaren av den aktuella qigongformen är inte optimalt; de något varierande resultaten kan möjligtvis förklaras av detta. En bättre kontrollbetingelse skulle ha varit en grupp som satt och läste en bok.


I Studie III fick qigongutövarna även skatta sitt känslomässiga tillstånd under qigongpasset. De nomotetiska mätningarna kompletterades med individuella beskrivningar av stämningsläget. Resultaten visade att de känslomässiga förbättringarna startar efter 10-20 minuters qigong och ökar i styrka under resterande del av passet. Qigongutövarna rapporterar skönare känslomässiga tillstånd som både är mer aktivativa och avslappnande. Den stora majoriteten av utövarna upplever att det känns behagligt under tiden de tränar qigong. Utövarna fick också fylla i en enkät om deras förväntningar om positiva känslomässiga förbättringar i samband med qigongpassen. Få signifikanta samband återfanns i relation till de verkliga känslomässiga reaktionerna. Slutligen fick också utövarna beskriva den qigongrelaterade känslomässiga
upplevelsen i ord. I motsats till resultaten på självskattningsinstrumentet (Swedish Core Affect Scale) beskrev majoriteten endast avslappnande sköna känslotillstånd (och inte också aktiverande känslotillstånd).

Sammantaget bidrar avhandlingen till en större förståelse av den tidigare begränsade kunskapen om qigongrelaterade känslomässiga reaktioner av akut slag. Utövarna upplever att deras känslomässiga välmående förbättras i samband med qigongtänking. Då urvalet består av självvalda, regelbundna utövare på qigongläger, begränsas möjligheten att generalisera resultatet till andra grupper av människor. Resultaten stämmer dock överens med liknande studier av tai chi, meditation och promenader vilket indikerar att också andra grupper av människor skulle kunna uppleva känslomässiga förbättringar i samband med qigong. Fortsatt forskning kring dessa frågor är därmed motiverad.
INTRODUCTION

In recent decades people have shown a growing interest in alternative and complementary medicine (Kelner & Wellman, 2000). Many individuals have been attracted to mind-body therapies (relaxation techniques, Yoga, meditation, hypnosis, guided imagery, Tai Chi, Qigong, etc.). In an American survey, 20% of the respondents had some experience of mind-body therapies (Wolsko, Eisenberg, Davis, & Phillips, 2004). Reasons for use were to treat medical conditions, general prevention and wellness promotion, and as leisure use. In our own country, activities ranging from mindfulness meditation (Åsberg, Wahlberg, Sköld, & Nygren, 2006), relaxation and somatic awareness training (Blomberg, 2004) to physical exercise (FYSS, 2008) are on the rise and pose great promise for living associated with balance, reduced stress, and well-being. Goldstein (2000) argues that the recent increased interest in alternative and complementary medicine is related to a greater interest in fitness. He proposes that this increased interest is connected to people viewing health as wellness (not only the absence of disease), health becoming more our own responsibility, a greater belief in the mind-body connection, skepticism toward the modern technological world, and people regarding health as a search for the natural. Frisk (1998) argues in a similar vein when describing the interest in new religious movements (New Age) in Sweden. Modern medicine may successfully treat more disease symptoms of than ever before in history, but it cannot give the individual answers related to the meaningfulness of disease, health, suffering, or life and death. Thus, mind-body therapies may provide a means to greater meaningfulness, health and healing, which may be pursued through different kinds of belief systems and activities, as well as personal and spiritual development.

The present thesis discusses Qigong exercise, a mind-body therapy that originated in China some thousands of years ago. I chose to study a group of regular exercisers at the Biyun School of Qigong (Medical Qigong), because it is one of the larger Qigong schools in Sweden. Since the end of the 80s, a growing number of studies on Qigong reporting health-enhancing effects can be found. However, little focus has been placed on the momentary/acute affective (affect, mood, & emotion) responses
associated with qigong exercise. Studying Qigong associated responses in the affective domain may have a number of benefits. Experiencing positive affect is of course a positive end in itself and important for subjective well-being. Positive affect may also lead to other health benefits (e.g., a more positive outlook on life). Many individuals (e.g., the elderly) may not be able to adhere to higher intensity exercise and may miss out on the beneficial psychological benefits associated with these activities.

The main purpose of the present thesis is the investigation of acute affective responses associated with Qigong exercise. Affective responses (See also affective states; Scherer, 1984) is used here as a generic term referring to any affective response (be it a mood state, an emotion or on the level of basic affect). As such, it is focused on the conscious feeling aspect of the affective domain and not on the physiological changes (facial, autonomic, brain-based, vocal, and other physiological changes; Larsen & Fredrickson, 1999) that accompany any subjective affective experience. Acute refers to the responses specifically associated with a single session of Qigong, in contrast to chronic, which refers to the effects of a series of sessions over a longer time (e.g., a few months). Given that new mind-body therapies are being used by more individuals and are also in demand by health care consumers (Landstingsförbundet, 2001), it is necessary to know more about their possible benefits as well as when caution is warranted in their use.

A number of Qigong forms exist. Biyun Qigong and the forms discussed by the majority of studies mentioned may be classified as Medical Qigong; hence their main focus is on prevention of disease and enhancement of health (although spiritual characteristics may also exist). When Qigong is mentioned in the present thesis, it is mainly the medical form that is referred to.
Qigong

Chinese philosophy and medicine

Qigong is an integrated part of Traditional Chinese Medicine (TCM). In order to understand Qigong one also needs to understand the traditional medicine and philosophy from which Qigong originated. A main difference between Western and Eastern philosophy is grounded in basic ontological and epistemological assumptions (Ames, 1993). Western philosophical perspectives, influenced by Greek and Christian traditions as well as the Scientific Revolution, focus on strict distinctions between concepts, such as body/soul, beginning/end, open/closed, subject/object, birth/death, etc. Eastern philosophical perspectives, influenced by Asian religions and philosophies such as Taoism, Confucianism, Buddhism and Hinduism, instead view the world in terms of dynamic processes that are complementary, co-dependent, cyclical and non-linear, and a more holistic view of mind and body. The yin and yang symbol can illustrate this perspective. Composed of a dark and a white side of a circle, the two sides are co-dependent on, and also part of, each other. A very important aspect of the co-dependency view in relation to TCM is that humans are like a microcosm and are influenced by everything in the cosmos. This is in stark contrast to the reductionist scientific medical view, in which humans are to some extent viewed as a machine with parts that can be fixed and exchanged if necessary (O’Connor, 2000).

Yin-Yang theory is essential to the understanding of TCM and Chinese philosophy. First mentioned in Tao Te Ching, 300 BC, yin and yang were the names used in the ancient interpretation that all manifestations of the world could be grouped into two opposites. At the same time, these two opposites are dependent on each other and contain each other. This illustrates the view that all aspects of life are interrelated with everything else. Yin and yang are visible in all aspects of Chinese life. Yin can be described as shadow, passivity, female, the moon, while Yang is light, activity, male, the sun. In the context of TCM, all the body’s organs are grouped into yin or yang. Too much yin or yang in the body is seen as an imbalance and can
lead to disease (Kaptchuk, 2000). In the context of Qigong, yin and yang can be illustrated as being in a state of simultaneous stillness and change (Cohen, 1997).

An essential characteristic of Chinese philosophy and medicine that does not exist in the West is the concept of qi. Qi can be described as “a type of energy or dynamic force that sustains and nourishes life” (Dorcas & Yung, 2003, p. 198). It is also sometimes referred to as vital force or life force. Similar concepts of life energy exist around the world, for example as prana in the Yoga tradition of India (Cohen, 1997). Qi may stem from different sources, coming from our parents, food and drink, and by way of our breath through the air. According to TCM, energy channels or meridians cover our inner bodies. Qi, the life force, flows through specific meridians. There are twelve regular meridians that are connected to the bodily organs, and eight extraordinary meridians that are not connected to the organs. A steady flow of qi through the meridians is vital to one’s health. It can be compared to a river in which there is a constant flow of water. Stagnation or a flow that is too wild is considered unhealthy (Kaptchuk, 2000).

According to TCM, the flow of qi may be regulated by way of different medical modalities. Acupuncture uses needles to treat special points on the meridians, acupoints. Specific acupoints have different functions and affect the flow of qi and the health of the individual in specific ways. Depending on the imbalance or disease the individual is experiencing, needles are inserted at certain acupoints. Acupressure and Qigong also directly aim to affect the flow of qi in the meridians, by way of massage and mental focusing to direct the flow of qi (Tse, 1998).

Emotions play a significant role in relation to health and well-being in TCM. Health is related to a healthy balance of different emotions, and overly strong emotions may cause disturbances and even disease. All emotions – not only anger, for example, which people in the West may find counterproductive to health (e.g., cardiovascular disorders) but also joy – in extremes may affect our health. According to TCM, strong emotions like anger can cause disturbances in the liver, joy can be negative for the heart, and sadness can be negative for the lungs (Fan, 2000).
History and definitions

Qigong belongs to a group of exercises called mind-body therapies (See also mind-body medicine, NCCAM, 2007; mindful exercise, Chow & Tsang, 2007; meditative movement, Larkey, Jahnke, Etnier, & Gonzales, in press; and meditation, Ospina et al., 2007), to which meditation, Yoga, Tai Chi, dancing, etc., also belong. These methods date back to prehistoric times and have religious connotations. Mind-body therapies have sprung out of repetitive, rhythmic chants and offerings to appease the gods (Joseph, 1998), and written records of them and their predecessors can be found in Hindu, Taoist, Buddhist, Christian, and Moslem scriptures (Everly & Lating, 2002). The goal of mind-body therapies can be therapeutic (health and well-being) as well as spiritual (finding peace and tranquility and transcending normal consciousness; Ospina et al., 2007).

Qigong originated in China, but it is possible that it has been influenced by Indian Yoga (Cohen, 1997) as the two traditions share some characteristics. Its earliest records date back some 3000 years (Chen, 2007). Qi is translated as life force and gong as work (Cohen, 1997). Qigong can be seen as a generic term referring to methods, “… working with the life energy, learning how to control the flow and distribution of qi to improve the health and harmony of mind and body. “ (Cohen, 1997, p. 4). The name Qigong was introduced in the 1950s and it was originally known as Dao-yin (Cohen, 1997). It is suggested (Cohen, 1997) that the core of Qigong exercise originated from farmers observing the cycles of planting and harvesting, and of life and death (other Qigong origins come from mimicking the movements of animals, e.g. the Five Animal Frolics). To ensure the growth of seeds it is important to establish strong, healthy roots for the plant to find a good support for growth; also important is daily care through optimal watering and sunshine. Many Qigong forms therefore advocate first creating a strong foundation/roots to build upon. Plants need water to grow, but in optimal doses. Qigong exercise is therefore recommended in daily optimal doses for a particular individual. Too little training may be insufficient to have any effect, and too much training may not create better health but might instead have negative effects for the individual (Ng,
By further observing the effects of water resources (Cohen, 1997), people living at the time Qigong developed came to the conclusion that a healthy, steady flow of clean water was important: Too much causes flooding, too little causes drought, and stagnant water can cause disease. This may have influenced the view on qi (life force), which flows in the meridians of the body, by way of Qigong exercises being enhanced and creating a healthy flow throughout all parts of the body. Through the performance of Qigong, the flow of qi can be optimized. Thus, one may illustrate a healthy human being with the example of a plant: A healthy plant is strong yet soft, swaying with the wind but not breaking. However, when the plant is sick it becomes stiff and rigid and easily breaks (Cohen, 1997).

**Different styles of Qigong**

Over the years the principals of Qigong exercise have been used in different forms and settings and for different aims. It can be divided into Active Qigong (Dong Gong), which includes slow movements and postures, and Passive Qigong (Jing Gong), which focuses more on mental concentration, visualization, and breathing. Active Qigong is the more popular form, in both China and the West. Most Qigong forms do, however, include both active and passive aspects, reflecting the importance of the yin and yang philosophy, encompassing the contrasting aspects of life (Cohen, 1997).

Today, Qigong is mostly known for its health-promoting characteristics, but it was initially created for the cultivation of the mind and spirituality (Chen, 2007). Historically it has had many different focuses, such as promoting moral development (Confucian Qigong) and spiritual development (Buddhist and Taoist Qigong), and preparing the body for combat and healing wounds (Martial Arts Qigong), in addition to Medical Qigong (Chen, 2007).

Qigong may also be grouped into Internal and External Qigong (Chen, 2007). Internal Qigong refers to the activity described above, carried out by the exerciser individually. External Qigong is a form of healing. According to TCM, the cultivation of qi and the ability to move it to different parts of the body thanks to many years
of Qigong practice may also create an ability to emit qi, break qi blockages, and remove sick qi from another person’s body. Many Qigong clinics in China provide External Qigong.

Although different Qigong forms may differ, most include adjusting the mind, body and breathing (Chen, 2008). Some forms may include actively performing specific movements (Dong Gong), standing like a pole (Zhuang Gong), and static forms of meditation (Jing Gong). The dynamic forms of Qigong that include movements are sometimes introductory forms, with the movements guiding and helping the exerciser to better concentrate on their internal body and induce qi flow. Static forms of Qigong include meditation (concentrative and mindfulness), relaxation, breathing manipulation, guided imagery, and incantation. Static forms are supposed to train intentional power (consciousness stability) while cultivating qi flow, and by way of the mind guide the flow of qi in the body. Standing like a pole refers to when an exerciser is in a standing up position, and spontaneous movements may occur. Thus, although different forms of Qigong exist, generally the exerciser first tries to attain a state of mind that is quiet and calm. When this is accomplished, the exerciser’s next goal is the cultivation of an awareness of experiencing qi and its movements through the body. Finally, different paths of cultivation can be followed such as gathering qi in the body, cultivating qi circulation, and other forms of guiding the flow of qi using the mind (Zhang & Rose, 2001).

**Research on Qigong exercise**

Qigong exercise has been shown to positively affect the psychological, neuroendocrine, and immune systems (Ryu et al., 1995). Interventions involving Qigong exercise have been found to reduce blood pressure and triglycerides as well as increase high-density lipoprotein (HDL) cholesterol (Lee, Lee, & Kim, 2004), and to reduce work-related stress (heart rate, noradrenalin urine excretion, finger temperature, and subjective experienced stress reactions) significantly more than controls (Skoglund & Jansson, 2007). In a psychological vein, cross-sectional studies show a
significant negative relationship between Qigong (length of practice) and neuroticism (Leung and Singhal, 2004) and perceived stress (Lee, Ryu, & Chung, 2000).

Qigong has also been used as an intervention (two to three months) for coping with and alleviating symptoms of diseases. Multiple sclerosis patients showed significant improvements in depression and balance (Mills, Allen, & Morgan, 2000), and fibromyalgia patients improved on measures of pain, physical and psychological functioning, anxiety and depression (Astin et al., 2003), and enhanced movement harmony (Mannerkorpi & Arndorw, 2004). Muscular dystrophy patients maintained perceived general health when performing Qigong while the control group deteriorated (Wenneberg, Gunnarsson, & Ahlström, 2004b). Hypertension patients reduced their blood pressure (and norepinephrine, epinephrine, cortisol, and perceived stress) significantly more than a control group did (Lee, Lee, Kim, and Moon, 2003). In a similar study, self-efficacy and self-esteem increased and blood pressure decreased (Lee, Lim, & Lee, 2004). Negative symptoms in cancer patients receiving chemotherapy were reduced and improvements in pain, numbness, heartburn and dizziness, as well as a greater will to live, were found (Lee, Chen, & Yeh, 2006). A randomized controlled trial including depressed elderly found improvements in mood, self-efficacy, and personal well-being (Tsang, Fung, Chan, Lee, & Chan, 2006). Thus, the increasing support for the benefits of Qigong seems promising in many ways.

Acute physiological responses to Qigong exercise have been predominantly studied by a group of Korean researchers. In their studies they have used the Chun Do Sun Bop style of Qigong, which in addition to the common characteristics of Qigong (e.g., relaxation and slow movements) also uses sounds. The Chun Do Sun Bop style is performed for 60 minutes, and a majority of fairly young male participants have been studied. Training background ranges from beginners having learned the procedure on certain occasions before the experiment to regular exercisers (up to a year). Studies show an increased secretion of growth hormone (Lee, Kang, Ryu, & Moon, 2004; Ryu, Lee, Jeong, Lee, Kang, Lee et al., 2000), improved immune function (Lee, Kang, & Ryu, 2005; Lee, Kang, Ryu, & Moon, 2004; Lee, Kim, & Ryu, 2005), and decreased breathing and heart rate during qigong (Lee, Kim, Huh, Ryu, Lee, &
Chung, 2000) – promising acute results, indeed; however, control groups were used only in the Lee, Kang, and Ryu study (2005).

Negative health effects of Qigong exercise are also reported. Ng (1999) reports increased psychiatric symptoms in some individuals, Qigong deviation syndrome. This may be associated with an extra sensitivity to the effects of relaxation: relaxation-induced anxiety (Heide & Borkovec, 1984), which may cause an individual to display increased anxiety. Detrimental effects may also stem from faulty training, such as overly long sessions (Ng, 1999). Fan Xiulan of the Biyun School states that when training recommendations have been followed, no detrimental effects have been seen. However, there are some conditions under which Qigong training should be avoided: epilepsy, serious psychiatric illnesses, and when under the influence of drugs or strong emotions. Special training precautions are also cited for menstruating and pregnant women (Fan, 2000).

Research on Qigong exercise highlights promising health-related benefits in many areas, such as the management and reduction of symptoms of diseases (fibromyalgia, hypertension, multiple sclerosis, and cancer), improved psychological and physical well-being, and a positive acute affect on the psychological, neuroendocrine, and immune systems. Some caution is warranted on scientific rigor grounds (e.g., use of control groups in only some of the studies).
Biyun Qigong

Biyun Qigong is one of the most widespread Qigong styles in Sweden, and was created and developed by Qigong master Fan Xiulan (Fan, 2000). Biyun Qigong can be described as a Medical Qigong style. Thereby, the focus is on the flow of blood and qi in the body, strengthening the function of the lungs, digestion, and other bodily functions. Biyun also focuses on strengthening muscles and joints that easily get worn out and exhausted. Yet, as TCM and qigong are holistic in perspective, typical spiritual elements are also included in Biyun Qigong, including the intention to raise consciousness (insight and a greater understanding of consciousness) by way of mindfulness (accepting and not clinging to emotions) and living in harmony with oneself, other people, and nature. By way of Qigong exercise, in which typical medical and spiritual perspectives are equally important, intentions of spiritual growth (de) and naturalness (wu wei) may lead to Tao, a state of harmony, peace and freedom. Fan describes Biyun Qigong as a “focused mindful concentration on the physical body to systematically increase qi in the body and to develop its ability to gather natural qi from the universe” [translated from the Swedish] (Fan, 2000, p. 31).

The Biyun School of Qigong consists of a number of specific forms of Qigong exercise. These range from beginner forms (Jichu Gong) to more advanced ones (Dong Gong, Five Elements Qigong, and Wai Chi). The beginner forms focus on softening the joints and opening up for the life force (qi) to flow in the body. The exerciser later focuses on gathering qi from the environment and cleansing the body of bad qi (Dong Gong). The more advanced forms focus on moving qi through the body, getting more attuned to the flow of qi and letting the body move spontaneously, and creating one’s own individual form of Qigong (Fan, 2000). All forms stress the importance of concluding by gathering qi by way of visualization as well as physically (by way of arm movements) and directing it into the Dantien (an energy center, a few centimeters below the navel).
Characteristics of Biyun Qigong, as well as those of many other forms of Qigong, include slow movements (physical activity), relaxation, concentration/meditation, imagery, natural breathing, and self-massage. These methods will be presented and discussed below, with a focus on their possible positive influences on affective states.

**Physical activity**

Qigong also includes physical activity in the form of slow movements. Physical activity refers to the movement of the body produced by the skeletal muscles, resulting in energy expenditure, which varies from low to high, and a positive correlation with physical fitness. In addition to what is stated regarding physical activity, exercise also includes planned, structured and repetitive bodily movements and the objective to maintain or improve physical fitness (Caspersen, Powel, & Christenson, 1985). Qigong exercise can be defined as a low-intensity physical activity and exercise (in addition to its mindful aspects), although its influence on physical fitness may be limited compared to jogging.

It is sometimes stated that the human body is designed for physical activity. Although this statement is difficult to test in an experimental setting, three lines of evidence support it (Bouchard, Blair, & Haskell, 2007). Firstly, the human body can adapt to the metabolic demands of its environment. Secondly, a low level of physical activity is associated with increased frequency of disease, loss of functional capacity, and premature death. Thirdly, without the ability to perform demanding physical work, early humans would not have been able to survive. Thus, we can conclude that being physically active lies inherent in us, and that the sedentary lifestyle of today have negative physical and mental effects (Bouchard et al., 2007). There is now a large body of evidence linking physical activity with the prevention of poor health, as well as the enhancement of health and well-being. The Surgeon General’s Report on Physical Activity and Health (USDHHS, 1996) cites numerous diseases and health-related aspects of life that are affected by physical activity, like lower mortality rates, decreased risk of cardio-respiratory disease, reduced risk of some forms of cancer, reduced risk of developing non-insulin-dependent diabetes mellitus, mainte-
nance of normal muscle strength, normal skeletal development during childhood, reduction of risk of falling among the elderly, lower rates of obesity and maintenance of a healthy diet, relief from symptoms of depression and anxiety, reduced risk of developing depression, improved health-related quality of life such as psychological well-being, and improved physical functioning.

A growing body of evidence from reviews of the literature supports the importance of physical activity for psychological health (Biddle & Ekkekakis, 2005; Biddle & Mutrie, 2001; Berger & Tobar, 2006; Landers & Arent, 2006; Mutrie & Faulkner, 2004; Scully, Kremer, Meade, Graham, & Dudgeon, 1998; Warburton, 2006). Physical activity is associated with reduced state and trait (acute and chronic) anxiety (Landers & Arent, 2006, Petruzzello et al., 1991; Scully et al., 1998; Taylor, 2000). Individuals suffering from clinical and non-clinical anxiety may benefit from physical activity (Landers & Arent, 2006; Taylor, 2000). Further, physical activity also has positive effects on psychosocial stress. Bouts of physical activity can reduce stress, and improved fitness is also associated with reduced stress reactivity and better coping (Berger & Tobar, 2006; Landers & Arent, 2006; Scully et al., 1998; Taylor, 2000).

Studies also show beneficial effects associated with physical activity on those suffering from depression (Paluska & Schwenk, 2000; Scully et al., 1998), and physical activity is also associated with a decreased risk of developing clinical depression (Mutrie, 2000). The effect of physical activity on depression is comparable to that of psychotherapy (Mutrie & Faulkner, 2000; Paluska & Schwenk, 2000).

A physically active lifestyle is associated with increased self-esteem (Biddle & Mutrie, 2000), improved cognitive functioning (Landers & Arent, 2006), and improved health-related quality of life, including physical functioning, physical symptoms, and emotional, social and cognitive functioning (Berger & Tobar, 2006; Rejeski, Brawley, & Shumaker, 1996). Thus, a large body of evidence now supports the relationship between a physically active life and improved psychological health. Acute affective benefits of single bouts of exercise also show promising results; this will be dealt with in a later section.
Relaxation

Biyun Qigong sessions begin with a few minutes of relaxation. Although the term *relaxation techniques* often includes a large number of relaxation-associated techniques like progressive relaxation, self-hypnosis, autogenic training, meditation, imagery, and biofeedback-assisted relaxation (Orne & Whitehouse, 2000; Poppen, 1998), relaxation may be a sole intervention in itself, sometimes being used in preparation or in combination with other techniques (Lichstein, 2000) like in qigong. Contrasting relaxation and meditation, relaxation is used primarily to reduce physiological arousal whereas meditation is more focused on directing one’s attention to the present moment (and not directly trying to change the level of arousal; Shapiro, Schwartz, & Santerre, 2005).

According to Biyun Qigong, relaxation training entails a systematic, mental screening of the inner and outer parts of the body, inducing relaxation. Qigong focuses on an optimal state in which we can gather qi from the environment. Relaxation is therefore stressed before beginning Qigong exercise, and when one is experiencing strong emotions Qigong exercise is not recommended (Fan, 2000). Also, through relaxing, thoughts and emotions can be prevented from interfering with our concentration and we may even forget ourselves (Fan, 2000). As no muscular activity is carried out (as it is in progressive relaxation, in which the muscles are first tensed and then relaxed), the form of relaxation in Biyun Qigong is associated with autogenic training, in which the practitioner by way of mental focus induces states of warmth and heaviness in different body parts (Sadigh, 2001). Words like *warm and nice feeling, relaxation* and *pleasantness* are used to induce relaxation in audio-recorded instructions in Jichu gong and Dong gong in the Biyun School (Fan, 2001, 2004). The exerciser is instructed to let go of all tension, irritation, and worries (Fan, 2000). Relaxation has been found to reduce physiological arousal (Scheufele, 2000) and emotional distress symptoms (Farné & Gnugnoli, 2000), and improve the capacity for control over imagery (Singer, 2006). Relaxation is also used in preparation for meditation to reduce arousal (Girdano, Everly, & Dusek, 2001). Qigong
Exercisers may benefit from relaxation training before actual Qigong, making it easier to relax and direct their attention to the body and mental imagery.

**Attentional regulation (meditation)**

The next phase in Biyun Qigong (Jichu Gong) refers to the actual Qigong activity. Systematically softening the joints from feet to head, the practitioner also focuses on the corresponding body part. This entails holding the attention at the specific area of focus. For example, when slowly rotating the ankle joint, focus is directed at the foot and the joint. Words like *strengthening* and *promoting* (Fan, 2001, 2004) as well as “thinking positively of the body part performing the movement” (Fan, 2000, p. 41) are employed. The concentrative/focusing techniques used are meditative methods. One definition of meditation refers to “... a family of self-regulation practices that focus on training attention and awareness in order to bring mental processes under greater voluntary control and thereby foster general mental well-being and development and/or specific capacities such as calm, clarity, and consciousness” (Walsh & Shapiro, 2006, pp. 229). Meditative disciplines are usually divided into concentrative and mindfulness forms of meditation (Carrington, 2008). In concentrative meditation, attention is focused on a specific object like the breath, a mantra, sounds, or different parts of the body like in Qigong exercise. If the mind wanders, thoughts come into one’s awareness or other stimuli interrupt, the exerciser is instructed to ignore these and return to focusing on the object of choice. Mindfulness meditation entails opening one’s attention to all kinds of stimuli, inside and outside, witnessing all the contents of consciousness, accepting everything. Qigong exercise according to the Biyun School is primarily focused concentrative meditation, but there are also examples of mindfulness meditation (Fan, 2000). The exerciser directs her attention/concentrates on specific body parts, in a relaxed and balanced manner. She may become unaffected of the things going on around her, and may even forget herself (Fan, 2000). In this state (the *Qigong state*) “… a new state of awareness that is not contaminated, tinted or distorted by the contents and processes of con-
sciousness comes into being, and the natural forces or energies of life (qi) are able to freely flow.” (Dorcas & Yung, 2003, p. 200). This state of consciousness is what most meditative traditions attempt to attain (Dorcas & Yung, 2003). It is the balance point between yin and yang (Fan, 2000), where the division between subject (me) and object (not me) disappear, and one may feel at one with the entire universe (Dorcas & Yung, 2003). Concentrative meditative practice may “allow the participant to feel inner balance, calm, and the ability to transcend the continuous flow of cognitions and emotions” whereas mindfulness meditation “may encourage insights into the maladaptive cognitive, emotional, and behavioral patterns” (Deikman, 1982). Meditation may improve well-being and stress management, and provide for important insights into one’s own life (Bogart, 1991), reduce state and trait anxiety and psychological distress (Shapiro, Schwartz, & Bonner, 1998), offer some support for the alleviation of anxiety disorders (although the small number of studies limit conclusions; Krisanaprakornkit, Krisanaprakornkit, Piya Vhatkul, & Laopaiboon, 2006), and help the fostering and cultivation of positive emotions (Fredrickson, Coh, Coffey, Pek, & Finkel, 2008). Fan Xiulan stresses the importance of focusing (Fan, 2000). The ability to concentrate during Qigong exercise is its single most important feature. Support for the importance of concentrative ability has been found empirically (Jouper, Hassmén, & Johansson, 2006).

Imagery

Several forms of Biyun Qigong include forms of imagery. Imagery can be provided from verbal suggestions in recorded instructions (it is common to use recorded instructions when performing Biyun Qigong). Verbal instructions (Fan, 2001, 2004) include thinking about an inner smile and imagining taking in positive, energizing life energy from the environment and directing it into the head, through the body, and down into the energy center of the body (the Dantien), a few centimeters below the navel. Further suggestions include focusing on health, strength, feelings of warmth, harmony, positive emotions and positive aspects of one’s life. These suggestions are examples of guided imagery. The aim of guided imagery is to affect one’s
physical, emotional or spiritual state by way of visualization (Barrows & Jacobs, 2002). Reviews of guided imagery show its beneficial effects on mood and well-being, and as a means of coping with stress (Astin, Shapiro, Eisenberg, & Forys, 2003; Gruzelier, 2002; Luskin et al., 1998). Visualizing pleasurable, relaxing images has been used to counteract anxiety (Singer, 2002). Through repetition, individuals may also learn to distract themselves from negative images (by replacing them with more positive ones) of consciousness, which may lead to an increased sense of mastery of internal experiences (Singer, 2002). The use of guided imagery in Qigong exercise may contribute to acute beneficial affective changes.

Respiration

Breath training is a part of many cognitive-behavioral, somatic, and mind-body therapies (Wilhelm, Gevirtz, & Roth, 2001). Whereas some mind-body therapies advocate controlling and changing the breath (e.g. Yoga; Brown & Gerbarg, 2005), as do some forms of Qigong (Cohen, 1997), Fan Xiulan, founder of Biyun Qigong, recommends natural breathing. This means letting go of one’s breath and not trying to control it. It is also common for the exerciser to use different breathing patterns during the Qigong session, as respiration is influenced by the different movements (Fan, 2000). Respiration is essential for maintaining life, and its regulation includes complex homeostatic interactions. It is central for emotion, health, and consciousness. Dysregulation of respiration may therefore have severe health consequences (Wilhelm et al., 2001). Different patterns of respiration affect individuals in specific ways. Shallow breathing may make people more anxious (Conrad et al., 2007), slowing down breathing frequency can reduce state anxiety (Han, Stegen, Valck, & Clément, 1996), and different emotions can be experienced through the induction of different breathing patterns (e.g. joy through regular, slow, deep breathing through the nose (Philippot, Chapelle, & Blairy, 2002). Physiologically, the slowing down of breathing frequency is associated with increased parasympathetic activity (Bernardi et al., 2002; Recordati, 2003). Patients are taught to use slow diaphragmatic breathing to manage and reduce anxiety disorders; through practice they may gain a
greater understanding of their symptoms and thereby reduce their fears (Wilhelm et al., 2001). In addition, when one gains feelings of mastery over one’s mental states, self-efficacy may increase (Bandura, 1982), followed by a reduction in anxiety.

**Self-massage**

Oxytocin has been shown to be associated with the pleasurable responses found in breast feeding, sexual activities, social interaction and massage (Uvnäs-Moberg, Arn, & Magnusson, 2005). It has been suggested as a vital part of the *calm and connection system*; a relaxed growth, a restorative processes system, and a counterpart to the *fight or flight stress response*. Massage has been shown to reduce anxiety (Moyer, Rounds, & Hannum, 2004), and self-massage has led to anxiety reduction in cigarette cravings (Hernandez-Reif, Field, Hart, 1999). It has also been suggested as an active mechanism providing the positive effects of mind-body therapies (Uvnäs-Moberg, 2000). In Biyun Qigong, most forms end with a number of minutes of self-massage (sometimes clapping) all over the body.
Studying affective responses

Psychological responses to Qigong exercise can include several aspects. Human mental functioning is generally divided into cognition, conation (e.g. motivation), and affect (Parkinson, Totterdell, Briner, & Reynolds, 1996). The aim of the present thesis is focused on affective responses. Below, the affective domain will be discussed. Affect and cognition are generally viewed as separate constructs (or as representing the opposite ends of a continuum; Panksepp, 2003). On a fundamental level, “cognition refers to representation of knowledge (truth and falsity)” whereas “affective refers to representations of value (goodness and badness)” (Clore et al., 2001, p. 29). Cognitive and affective processes are, however, seldom completely separate from each other, and are instead intertwined in each other’s processes; both are essential to basic human functioning (Forgas, 2008).

Affect influences cognition in many ways. Affect may influence “how people remember, perceive, and interpret social situations and execute interpersonal behaviors” (Forgas, 2008, p. 99). When we consciously experience a mood, it influences not only how we interpret our situation, but also how we see our relation to that situation, and our affective reactions to it (Parkinson et al., 1996). Affect may function as conscious information, helping our rational thinking make choices (Schwarz & Clore, 1983). It may be interconnected with ideas and memories and may automatically prime cognitions – mood congruency (Parkinson et al., 1996), and it may influence cognition through different ways of information processing. When in a happy mood people tend to remember happy memories, and vice versa (Eich & Macauley, 2006); happy people perceive more happy behaviors in themselves and others (Forgas, Bower, Krantz, 1984), and think happier thoughts (Parkinson et al., 1996).

Differentiating between affect, mood and emotion

The study of affective responses to physical activity and Qigong exercise pose some basic problems as no consensus exists regarding what an emotion is, several con-
Structs coexist side by side (Russell & Feldman Barrett, 1997), and affect, mood, and emotion are used interchangeably, which creates confusion (Ekkekakis & Petruzzello, 2000). See Figure 1, for a simplified summary of affective states.

Figure 1. Affective states and their components based on discussions in the text. Note that affect is a vital part of both mood and emotion.
The difference between affect, mood, and emotion (See Figure 3) can be seen from an evolutionary perspective, by which affect is considered the most basic, mood on an intermediate level, and emotion as a later stage of human evolutionary development, including cognitive components, and therefore a more complex phenomenon (Ekkekakis & Petruzzello, 1999). Affect refers to “the irreducible aspect that gives feelings their emotional noncognitive character” (Frijda, 1993, s. 383). Affect is regarded as all valenced (“good-bad”) responses, including emotions and moods (Frijda, 1994; Gross, 1999; Scherer, 1984. It colors our experiences, and without it they would be a neutral gray (Batson, Shaw, & Oleson, 1992). The word feeling is synonymous with affect (Berkowitz, 2000) and refers to conscious experience.

Moving on to emotion, most theorists agree that in addition to affect, which is probably the most essential component (Feldman Barrett & Russell, 1999), emotion also includes appraisals/cognitions, action tendencies and physiological responses (Frijda, 1994). Although some argue that mood is made up of the same components as emotion is (Frijda, 1994), it is the conscious, subjective experience – affect – that is the focus in mood research (Watson, 2000). Some even consider mood to be an extended form of affect (or core affect; Russell & Feldman Barrett, 1999).

Although they display some similar characteristics, emotion and mood differ on some important issues, making them related yet separate constructs. An emotion is considered a short (a few seconds), highly intensive affective state. It also has a clear object that sets it off (Frijda, 1994). “They are about something. One is happy about something, angry at someone, afraid of something” (p. 381). In contrast, moods are of longer duration (from hours to days) and are milder than emotions. Emotions can be viewed as occupying the foreground of consciousness, whereas moods occupy the background (Rosenberg, 1998). Another distinguishing characteristic is the absence of a clear object eliciting the moods. Moods are therefore more diffuse compared to emotions (Ekkekakis & Petruzzello, 2000). External stimuli may induce moods, but whereas emotions indicate “reactions to specific affectively important events” mood is “a cue to one’s current global state of action readiness and/or evaluation of the life situation” (Morris, 1999, p. 171). Emotions influence action, while moods influence cognitions (Davidson, 1994; Frijda, 1994). Emotions and moods may influence each
other. Moods may modulate the threshold for eliciting an emotion (Frijda, 1994). Being in an irritated mood may, for example, lower one’s threshold for anger (emotion). Conversely, some emotional episodes may combine into a mood state (Parkinson et al., 1996).

The issue of defining affective states has created many different conceptualizations, the two main groups of which are the discrete/categorical view and the dimensional view. Proponents of the discrete/categorical view argue for the existence of a number of distinct categories of emotions. This is supported by research that shows that people around the world display similar facial expressions related to a number of specific emotions, including fear, anger, sadness, enjoyment, and disgust (Ekman, 1992).

Conversely, proponents of the dimensional view of emotion (affect) argue that affective states can be described as two or three dimensions. One such example, the circumplex model of affect (Russell, 1980), is represented by “two orthogonal and bipolar dimensions, valence (pleasure-displeasure) and activation (low-high; see Figure 2). Specific affective states are considered combinations of the two dimensions” (Rose & Parfitt, 2007, p. 282). A few different variations of this structure, the circumplex structure of affect, exist (Larsen & Diener, 1992; Russell, 1980; Thayer, 1996; Watson & Tellegen, 1985). Russell’s circumplex structure of affect has also been found across different cultures (Russell, Lewicka, & Niit, 1989).

Watson and Tellegen (1985) emerged with a different variation of Russell’s circumplex structure. Instead of separate valence and activation constructs (Russell, 1980), Positive Affect (high Positive Affect is Pleasant Activation in Figure 1) and Negative Affect (high Negative Affect is Unpleasant Activation in Figure 1) intertwined (rotational variant; Feldman Barrett & Russell, 1999). Yik and colleagues (Yik, Russell, & Feldman Barrett, 1999) showed that the four different views of the affect circumplex (Larsen & Diener, 1992; Russell, 1980; Thayer, 1996; Watson & Tellegen, 1985) are actually the same structure viewed from different angles. These different views can be grouped into un-rotated and rotated variations. Biological correlates exist for both perspectives (Ekkekakis & Petruzzello, 2002).
There has been a debate between those who advocate that positive and negative affect are independent of each other – unipolar scales (e.g. Watson & Tellegen, 1985), and those who argue that they are poles on a continuum – bipolar scales (e.g. Russell, 1980). There is still some controversy around this issue, but one could conclude (Berkowitz, 2000) that when looking at a narrow time span (the experience of moment-to-moment affective states) we sometimes have a mixture of affective states, but when we are having one very strong positive feeling it is unlikely that we will also report a very strong negative feeling. When reporting milder affective states, individuals may report a mix of both positive and negative feelings.

So which view best describes affective states, the discrete/categorical view or the dimensional view? They complement each other. The categorical view is preferred for studying specific emotions (which can be done in great detail), while the dimen-
sional view is preferred when the focus of study is feelings on a more basic level (e.g., pleasantness-unpleasantness), and less is known about the area of focus (Ekkekakis & Petruzzello, 2000; Larsen & Diener, 1992).

Regulating affective states

Affect regulation is defined as “any process directed at modifying or maintaining moods or emotions whose operation depends on monitoring of affective information” (Parkinson et al., 1996). Affect regulation includes coping, emotion regulation, mood regulation, and psychological defenses (Gross & Thompson, 2007).

Reasons for regulating affective states are many: adapting to challenges in life, health and relationships, and maintaining a global sense of subjective well-being (Larsen & Prizmic, 2004). The inability to regulate affective states (particularly emotion) is related to a large number of psychiatric disorders and reduced mental health (Gross, 1999).

Gross (1999) makes distinctions between where in the emotional process the regulating intention is directed. Focus may be directed at the situation. We can choose situations that will provide us with desirable emotions – situation selection. We can also try to modify the situation, acting in a way that causes us to receive desirable emotions. In the specific situation we may also modify what we attend to (distraction & concentration). As the emotional response is building up in us, we may also cognitively change by way of reappraisal. A situation that was earlier appraised as frightening may now be appraised differently. Finally, we may deal with emotions (response modulation) by way of drugs, exercise or relaxation (Gross, 1999). How we attend to affective states may also be different based on whether they are negative or positive (Larsen & Prizmic, 2004). Behaviors often used to regulate negative affective states include distraction, venting (expressing the negative affect), suppression, cognitive reappraisal, self-reward, exercise, relaxation, eating and other physical manipulations, socializing, and withdrawal (spending time alone), while behaviors to increase positive affect instead include gratitude, helping others, and humor. Some researchers argue for the benefits of accepting the emotional content without doing
anything with it (Fruzzetti, Shenk, Mosco, & Lowry, 2003), like in mindfulness meditation. Thayer and colleagues (Thayer, Newman, & McClain, 1994) report that the most effective way to change a bad mood is a combination of relaxation, stress management, and cognitive and exercise techniques. In this context, Qigong may also serve as a tool for regulating affect (reducing negative affect and enhancing positive affect).

**Antecedents and dynamics of affective states**

What determines our affective states? Is it as simple as feeling good when we do something we like and feeling bad when we do something we do not like (Parkinson et al., 1996)? A great number of antecedents that influence our affective states are always present. Watson (2000) suggests that moods are influenced by affective traits (personality traits like neuroticism have been associated with negative affect; Larsen & Diener, 1992), situational/environmental factors (activities, food and drink, physical aspects of the environment, and hassles), endogenous/sociocultural rhythms (circadian rhythms may influence during the day, menstrual cycles in women during the month, and seasonal changes), and individual characteristics. Further, research shows that positive mood is usually low at the beginning and the end of the day (peaking around midday). People generally report better mood during the weekend than on weekdays, and from April to September than from October to March (in the northern hemisphere). He concludes that positive moods are associated with active behavior (doing) and negative moods are more associated with thoughts (thinking) (Watson, 2000). It is also important to consider what state the individual was in before he/she assessed his/her affective state. A pleasant mood may not be exceptionally high, but may rather be a consequence of feeling less bad (Parkinson et al., 1996).

Determinants may not only influence the individual from outside in a causal relationship uniform to all individuals. A different perspective entails the person-environment fit, or the *transactional perspective* (Parkinson et al., 1996). A consequence of the transactional approach is not what kind of antecedents influence affective states, but how we interpret them. In the context of Qigong exercise, there
may be characteristics in the regimen (e.g., slow movements and relaxation) that are
known to influence affective states positively; additionally (from a transactional per-
spective), it is important that the exerciser experience enjoyment (Motl, Berger, &
Leuschen, 2000) for the benefits to occur. Thus, cause and effect and transactional
approaches may work at different times or simultaneously (Parkinson et al., 1996)
to influence affective states.

Measuring affective responses

A number of self-report measures have been created to assess affective responses (af-
flect, mood, and emotion) associated with exercise. The assessment of affect, based
on (or in concordance with) Russell’s (1980) view of affect (pleasantness and activa-
tion) can be made with one-item scales, like the Affect Grid (Russell, Weiss, & Men-
delsohn, 1989), the Self Assessment Manikin (SAM; Bradley & Young, 1994), and
the Feeling Scale (Hardy & Rejeski, 1989) together with the Felt Arousal Scale of the
Telic State Measure (Svebak & Murgatroyd, 1985). An example of a multi-item
scale is the Activation Deactivation Adjective Check List (AD ACL), which is based
on Thayer’s view of affect (consisting of tense and energetic arousal; Thayer, 1989).
Another multi-item scale is the Positive And Negative Affect Scale, based on Watson
and colleagues’ conceptualization (PANAS; Watson, Clark, & Tellegen, 1988). Af-
flect measures have also been created in Swedish: Sjöberg, Svensson, & Persson
(1979), the Swedish Core Affect Scale (SCAS; Västfjäll, Friman, Gärling, & Kleiner,
2002) and Knez and Hygge (2001). Several of the above-mentioned affect scales are
often also defined as mood measures (AD ACL, PANAS, and SCAS), given that some
researchers view mood as an extended form of affect (Russell, 1999) or as similar to
affect (Watson, 2000).

The Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1981) is the
most widely used measure in Sport and Exercise Psychology (LeUnes & Burger,
1998). Another very common measure is the State and Trait Anxiety Inventory
(STAI; Spielberger, Gorsuch, Luschene, Vagg, & Jacobs, 1983). The POMS assesses
six mood states and is considered a mood questionnaire (Gauvin & Spence, 1998).
The STAI measures anxiety and is considered to assess emotion anxiety (Gauvin & Spence, 1988).

A group of measures are based on the idea that exercise-induced affective changes are specific to that context. Self-report measures have therefore been created to assess the specific affective changes taking place when exercising. These instruments include the Exercise-induced Feeling Inventory (EFI; Gauvin & Rejeski, 1993), the Subjective Exercise Experience Scale (SEES; McAuley & Corneya, 1994), and the Physical Activity Affect Scale (PAAS; Lox, Jackson, Tuholski, Wasley, & Treasure, 2000).

A framework for the study of affective responses

As the area of affective sciences includes several different views of affect, there is a need to decide how to view affective responses in the context of Qigong exercise. I have adopted the view presented by Ekkekakis and Petruzzello (2000), who advocate a functionalist view of affect in which all kinds of information processing (emotional and cognitive) are adaptational to the demands of the environment through pairing survival and well-being with survival and well-being-enhancing behavior (Keltner & Gross, 1999). The functionalist perspective view distinguishes between affect and emotion, on different levels of information processing, stemming from earlier and later stages of human evolution, cognition being a later development in consciousness than affect (Panksepp, 2003). Emotions, which include cognitive (and other) components, therefore comprise a later and more complex structure than affect (Izard, 1993; Leventhal & Scherer, 1987). Leventhal and Scherer’s model (1987) spans from sensory-motor levels (automatic and reflex-like) to more complex levels of information processing: schematic (more cognitive level, integration between automatic processes and feelings) and conceptual levels (highly cognitive level with abstract rules about emotions). Ekkekakis and Petruzzello (2000) suggest that exercise affects the exerciser on all levels (from basic to more complex). The statement about vigorous exercise that “it hurts so good” may therefore be interpreted from different levels of processing (Ekkekakis, 2003, p. 217): On a more basic level,
the signals of exhaustion and depletion of energy from the body may signal negative
effects, while on a more complex level, the fact that one is engaging in an exercise
regimen may induce feelings of pride and satisfaction. Similarly, in a Qigong con-
text, the slow movements may be experienced as pleasant, and on a higher level as
joy or happiness for some or as boring for others as the movements may make them
feel restless and wish they were doing something “more useful”.

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Suggested mechanisms for acute affective benefits

Given that Qigong exercise constitutes a number of different characteristics, including slow movements, relaxation, meditation, imagery, natural breathing and self-massage, a number of different theories on active mechanisms may work simultaneously and interactionally to affect the exerciser’s affective state. Below are some suggestions and theories that intend to explain the Qigong exercise-affect relationship. Chen (2008) speculates on how Qigong may enhance health and healing from a TCM perspective: 1) First, vital qi may flow more strongly through the meridians after Qigong practice and enhance health; 2) The cultivation of consciousness and intention (yi) may release suppressed emotions and resolve mental disturbances. Fan (2000) states that emotional disturbances may be cleared by Qigong exercise. Further, it may release the individual from the socialized self (determinant of stress) and allow him/her to return to a more natural original self. 3) Finally, Qigong exercise may uncover the body’s self-healing capabilities by strengthening the immune system.

From a Western scientific point of view, Qigong exercise may affect the exerciser in a number of different ways, including the nervous system, by way of the relaxation response, placebo/positive expectations, cultivation of positive emotions, altered states of consciousness, and other suggestions and theories related to physical activity and exercise science. The autonomic nervous system consists of two parts, the sympathetic (mobilizes and utilizes energy) and the parasympathetic (promotes restorative processes), which enables the body to adapt to different environmental situations and secure the individual’s survival. Certain behavioral conditions are more prevalent in one or the other of the two systems (Recordati, 2003). Sympathetic behaviors include the transition from sleep to wakefulness, muscle exercises and mental arousal. Among conditions such as sleep, hibernation and post-exercise, the voluntary control of breathing, grooming and repetition of a stimulus seem especially relevant as they are important aspects of Qigong exercise. Grooming refers
to activities concerned with the primary biological functions of caring for the body surface, and may in this case be related to self-massage and clapping of the body, as well as the focus on the inner body which are performed during qigong. Also, the repetition of a stimulus is evident in Qigong activities in the repetitive, slow movements. Finally, slow, deep breathing increases parasympathetic activity (Bernardi, 2002), also a vital part of Qigong exercise. It is suggested that sympathetic activity focuses on work related to the external environment, while parasympathetic activity instead focuses on work related to the internal environment, self-protection and recovery (Recordati, 2003).

Research on meditation at the beginning of the 70s led to the suggestion that mind-body therapies share specific characteristics that may elicit the Relaxation Response (Benson, 1983; Esch, Fricchione, & Stefano, 2003). These characteristics include a mental device (a sound, a word, or some other object for mental focus), a passive attitude (not worrying about how well one is performing, or if distracting thoughts occur, redirecting one’s attention to the repetition of the mental device), decreased muscle tonus (a comfortable posture or sitting position), and a quiet environment (Benson, Greenwood, & Klemchuk, 1975). The Relaxation Response is associated with decreased sympathetic nervous system activity, reduced oxygen consumption, reduction in heart and respiratory rates, decreased blood lactate concentration, increased alpha-wave activity, and stabilization of muscle blood flow (Benson, 1983; Benson et al., 1975; Levander, Benson, Wheeler, & Wallace, 1972).

Mind-body therapies (Jin, 1992) and physical activity (O’Halloran, Murphy, & Webster, 2002, 2005) have been associated with the placebo effect or positive expectations. A number of theories attempt to explain how placebo may affect psychological and physiological health: Expectancy Theory, classical conditioning, and Emotional Change Theory (Catanzaro & Mearns, 1999; Olson, Roese, & Zanna, 1996). In the context of the Schematic Processing Approach, Lund (1987) suggests that by taking a placebo or engaging in something one believes will lead to a positive outcome, a cognitive schema of expected effects is activated. When activated, individuals are more likely to recall and notice information or experiences that are consistent with that schema, interpret ambiguous information consistent with the
schema, and overlook mildly inconsistent information or dismiss it as invalid. Given that the placebo effect is enhanced when one has an inner bodily focus (Geers, Helfer, Weiland, & Kosbab, 2006), it is likely that positive expectations and affective Qigong outcomes will be associated (or perhaps also have an influence), as the qigong exerciser focuses on the inner body.

Qigong exercise and similar relaxation techniques may enable the cultivation of positive emotions (Fredrickson, 2000). While negative emotions may narrow the thought-action repertoire (e.g., fear is linked with the need to escape), positive emotions may work and function in a different way. In herBroaden-and-Build Model of positive emotions (1998), Fredrickson suggests that positive emotions may broaden an individual’s thought-action repertoire so that it is incompatible with that of negative emotions. This can loosen the hold that negative emotions such as depression or anxiety may have over the individual’s psychological and physiological responses (the Undoing Hypothesis). Specifically, Qigong exercise may cultivate positive emotions like contentment (an appreciation for the present moment and also integrating those experiences to better appreciate one’s place in the world). Relaxation techniques are often multicomponental (Qigong consists of relaxation, visualization, relaxed breathing, etc.). They may focus on one component that is included in the emotion. The relaxation of muscles in relaxation training may be associated with the physiological relaxed state of the body that is associated with experiencing positive emotions. Inducing one component of the emotion may jump-start other components of the same emotion (e.g., cognitions and facial expressions).

Qigong exercise may also induce an Altered State of Consciousness (ASC; Vaitl, Birbaumer, Gruzelier, Jamieson, Kotchoubey, Kübler et al., 2005) by way of respiratory maneuvers, relaxation, etc. These states are associated with changes in activation, awareness span, self-awareness (e.g., absorption in the activity and forgetting the self), the experience of sensations, body image, suggestibility, time experience, emotions, self control, and sense of personal identity (Farthing, 1992; Vaitl et al., 2005). One example of ASC is Flow or Optimal Experience (Nakamura & Csikszentmihalyi, 2002). The Flow state may be induced when the individual’s ability matches the demands of the activity and when goals and feedback are clearly visible.
The Flow state is characterized by great focus on the present moment, a merging of action and awareness, a loss of reflective self-consciousness, a sense of control and of time distortion, and is rewarding in itself (intrinsic). A related concept is absorption, in which an individual forgets everything else except the focus of attention. Whereas absorption is characterized by passivity, concentration or attention is more active, although they are related (Davidson & Schwartz, 1976). The ability to concentrate has been associated with perceived health in the context of Qigong (Jouper, Hassmén, & Johansson, 2006) and is very important in Qigong practice (Fan, 2000). In his cognitive-behavioral model of relaxation, Smith (1990) stresses the importance of focusing, passivity, and receptivity for inducing a relaxed state, suggesting an optimal level between activity and passivity for relaxation. A suggestion was recently presented for biological correlates of ASC experiences: The Transient Hypofrontality Hypothesis (Dietrich, 2003). This theory states that by narrowing attention (through focusing on the body, breathing, or a mantra), higher cortical functions (the prefrontal cortex) responsible for analyzing, differentiating, and logical reasoning may be down-regulated, leading to a state of unity, timelessness, absence of reflection, and reduced depression and anxiety. Thus, because of the characteristics of Qigong an altered state of consciousness can be induced, which can be experienced as a pleasant affective state.

Leaving the more general suggestions for the Qigong-affect relationship, I now turn to those that are specific to physical activity and the area of exercise science. Although it is only one component of Qigong, the role of low-intensity physical activity is important. By engaging in an activity the exerciser can feel good about him/herself for being able to adhere to the regimen, master difficult movements, or reduce arousal (mastery/self-efficacy; Bandura, 1982). This may lead to a sense of accomplishment affecting physical self-efficacy and self-concept, which may lead to increased global self-esteem (Sonstroem & Morgan, 1989). The Time-Out Hypothesis (Bahrke & Morgan, 1978) suggests that anxiety may be reduced due to a leaving behind of, or taking a time-out from, worries. The activity in itself does not lead to a better affective state, but instead simply distracts the exerciser from the stressors of daily life. The secretion of endorphins (Hoffman, 1997) and neurotransmitters
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(serotonin, dopamine, epinephrine, etc.) as the biological correlate of value for well-being (Chaouloff, 1997; Dishman, 1997) has been suggested as the reason for the emotional benefits associated with physical exercise. The affective benefits of exercise may also be influenced by increased body temperature (Thermogenic Hypothesis; Petruzzello, Landers, & Salazar, 1993), by being regularly influenced by the stress of physical activity (Physiological Toughness Model; Dienstbier, 1989), the fact that being physically active is inherent in our genetic makeup (living a sedentary life therefore creates negative mental health; Anthropological Hypothesis, Martinussen, 2002), and by socially interacting with other people. All the suggestions mentioned may provide for affective responses in the context of Qigong (except perhaps the Thermogenic Hypothesis and the Physiological Toughness Model), and social interaction may not be solely responsible, as solitary exercise has led to improved affective states (Szabo, 2003).

The Opponent Process Theory (Solomon & Corbit, 1973) has been associated with physical activity-associated affective benefits. This theory is based on the assumption that the brain is organized to oppose both pleasurable and aversive emotional states, by creating a countering reaction. As the body is greatly activated during exercise, upon extinction of the bout, the opponent process, a pleasant deactivated state will follow. Extending the Opponent Process Theory, Bixby and collaborators suggest that the intensity level of the exercise influences the affective change (Bixby, Spalding, & Hatfield, 2001). Affective changes of high intensities, the Rebound Model, are characterized by an initial decline in perceived affect (aversive) and later an increase in affect reaching higher affective levels (than baseline) at postmeasurements. At low intensities, the affective change is characterized by an elevation of affect until it reaches a plateau, referred to as the Maintenance Model. Both high and low intensities lead to post-exercise elevation of affect, but affective changes during exercise take different pathways.

A recent important suggestion is the Dual-Mode Model (Ekkekakis, 2004), which is based on the assumption that physical activity is an essential component of human evolution. Affective responses are evolved psychological mechanisms that are adaptational in that they promote health and well-being by way of pleasure (utility).
and displeasure (danger). Affective responses are dependent on a hierarchically organized system with different controlled components and encompass functions from primitive ones that show little inter-individual variability to more advanced ones that show greater variability. Further, the affective responses to physical activity are dependent on the interplay between two factors: cognitive processes (meaning of exercise, goals, self-perceptions) and interoceptive cues (exercise-induced physiological changes). Low intensities are proposed to be characterized by a low influence of cognitive factors and most individuals experiencing pleasure during the bout. Medium intensities display a strong influence of cognitive factors and great variability between individuals; some experience more pleasantness, some more unpleasantness (during). Finally, high intensity levels of exercise are instead theorized as displaying a strong influence of interoceptive factors and with most individuals experiencing displeasure. The majority of individuals are proposed to experience pleasantness post-exercise.

**Acute affective responses to physical activity**

Reviews of the literature show that affective improvements accompany the termination of most forms of physical activity (Biddle, 2000; Ekkekakis & Petruzzello, 1999; Reed & Ones, 2006; Yeung, 1996). Focusing on low and moderate-intensity exercise, a number of studies on walking display acute affective benefits. Five minutes of walking was associated with increased energy post-exercise (Thayer, Peters, Takashi, & Birkhead-Flight, 1993) and perceived energy and tension reduction (Thayer, 1987). State anxiety was reduced after a 40-minute walk on a treadmill (Porcari, et al., 1998). Ekkekakis and colleagues (Ekkekakis, Hall, Van Landuyt, & Petruzzello, 1999) found that short walks (10-15 minutes) were associated with increased activation and more positive affective valence during the bout. Recovery from walking was associated with calmness and relaxation. Further, active middle-aged and elderly individuals were prescribed 15 minutes of walking or silent reading. Results displayed increased self-reported energy during and post-exercise (Ekkekakis, Backhouse, Gray, & Lind, 2008) significantly better than the control con-
dition. The above studies show that low-intensity exercise of short duration may also provide for a better affective state.

Other variables important for the improvement of affective reactions in relation to physical exercise include self-selected intensity (Parfitt, Rose, & Marklund, 2000), the activity being enjoyable (Daley & Maynard, 2003; Lane, Jackson, & Terry, 2005, Parfitt & Gledhill, 2004), similar affective benefits independent of duration (Daley & Welch, 2004; Hansen, Stevens, & Coast, 2001; Petruzzello & Landers, 1994), the bout not exceeding 75 minutes (Reed & Ones, 2006), cognitions during the bout (Blanchard, Rodgers, & Gavin, 2004), and the affective state before the bout (more negative affective state before is associated with more positive state after (Reed et al., 2004)).

For a long time, the recommended intensity level of physical activity for optimal affective benefits was that of moderate levels (cf. Berger, 2001), and it was suggested that a certain intensity threshold was necessary for the provision of these benefits (Kilkcaldy & Shephard, 1990). In his Dual-Mode Model (described elsewhere), Ekkekakis (2004) posits that pleasurable responses can be found at all intensities except high intensity. This model has some support (Ekkekakis, Hall, & Petruzzello, 2005; Welch, Hulley, Ferguson, & Beauchamp, 2007), and from the discussion above about investigations of activities ranging from low intensities like walking to higher intensities, many levels of intensity are associated with affective benefits.

Acute affective responses to mind-body therapies

Investigations of specific mind-body therapies show affective benefits in a number of studies. Yoga is related to a predominantly sympathetic tone of the nervous system during the activity and parasympathetic after (Savang & Telles, 2006). Negative mood and anxiety were reduced after a Yoga session, but there was no increase in Vigor (positive mood; Berger & Owen, 1992). Tai Chi showed a reduction in sympathetic nervous system activity and an increase in parasympathetic activity after a bout (Lu & Kuo, 2003). In another study, at post-measures, Tai Chi displayed increased heartbeat, increased urinary noradrenalin, decreased salivary cortisol, and
increased positive mood (Vigor) as well as decreased negative mood (anxiety, tension, depression; Jin, 1989). Relaxation was associated with a reduction in arousal and distress (Peveler & Johnston, 1986) and an alleviation of somatic and cognitive anxiety (Gill, Kolt, & Keating, 2004).

Comparing the effects of different mind-body therapies and other activities, both relaxation and short walks were associated with a reduction in tense arousal, but only walks were associated with feeling energized afterwards (Saklofske, Blomme, & Kelly, 1997). Yoga was associated with increased perceived physical energy and feeling alert, while relaxation increased sluggishness (Wood, 1998). Studies by Berger and associates (Berger, Friedmann, & Eaton, 1988; Berger & Owen, 1992) display similar post-exercise effects (reduction in negative mood) that were significantly different from controls. Low-intensity mindful activities (Feldenkreis & Yoga) were superior in enhancing subjective well-being and reducing state anxiety and depression compared to a high-intensity non-mindful activity (dance aerobics; Netz & Lidor, 2003). Finally, Tai Chi, Yoga and Martial Arts were associated with a reduction in psychological distress, fatigue and exhaustion to the same extent, however only the Tai Chi and Yoga displayed increased tranquility (Szabo, Meskó, Caputo, & Gill, 1998).

Mind-body therapies show changes comparable to other physical activities, as they share similar characteristics. However, when they lack the physically active aspect, like in relaxation, people generally do not feel activated like they do in Yoga and Tai Chi. Feeling activated is probably associated with the intensity of the activity. Naruse and Hirai (2000) showed a positive relationship between exercise intensity and arousal level (lower intensity and lower arousal). It has been proposed that mind-body methods may reduce negative mood while not enhancing positive mood (Yeung, 1996). Few results of the above-mentioned studies show increased positive mood; however, this may be due to the use of scales predominantly covering negative aspects of mood, such as the POMS (five negative subscales and one positive). Mind-body therapies seem to affect the exerciser in ways that stabilize the nervous system and provide a reduction in negative mood and sometimes an increase in positive mood.
Acute affective responses to Qigong exercise

Qigong studies have also focused on acute psychological responses to single sessions. Qi-training (Qigong) of a group of male beginners (having learned the form prior to the study) was studied, comparing an actual session with a sham-control (movements without mindful intention) qi session (Lee, Kang, Lim, & Lee, 2004). State anxiety (STAI) was reduced significantly more (26% to 9%) in the actual Qi-training session. Also, plasma concentration of ACTH, cortisol, and aldosterone decreased in the Qi-training condition but not in the sham session. It is concluded that Qigong has effects on the hypothalamic-pituitary-adrenal axis. Kjos and Etnier (2006) used the PANAS (Watson, 1988) to study affect before, after and at three 15-minute intervals pre-exercise, for a group of older (mean age 65 years) female beginners who had learned Qigong prior to the study. The effects of Qigong were compared to walking. There was a significant increase in Positive Affect from pre-exercise to post-exercise (similar to Pleasant Activation in Figure 2) that was comparable to walking. Positive Affect rapidly decreased after the bout to below pre-exercise levels at the post-15-minute assessment. No significant change was found for Negative affect (similar to Unpleasant Activation of Figure 2). Qigong was considered a moderate-intensity activity that was comparable to walking.

The above two sole studies of acute affective responses to Qigong exercise display promising benefits. However, in the context of Unpleasant Activation (Figure 2), where anxiety and Negative Affect can be found, contrasting results are found; a reduction in anxiety in the Lee et al. (2004) study, and no significant reduction in Negative Affect in the Kjos and Etnier (2006) study. The reasons for this difference are not known, but there were only men in the Lee et al. (2004) study and only women in the Kjos and Etnier (2006) study. This also shows the limitations associated with using the PANAS (restricted to only the high activated poles of the circumplex structure of affect) in the context of Qigong. It seems reasonable that Qigong is also associated with the deactivated poles of the circumplex (e.g., Unpleasant Deactivation).
Unanswered questions in the Qigong-affect relationship

When work was commenced on the first study of the present thesis, Qigong exercise had only been found to reduce state anxiety (Lee et al., 2004). However, anecdotal reports, a master’s thesis (Brinker, 1998), and studies of mind-body therapies (Berger et al., 1988; Berger & Owen, 1992; Jin, 1992; Gill et al., 2004; Peveler & Johnston, 1986; Saklofske et al., 1997; Szabo et al., 1998) and low-intensity physical activity (Ekkekakis et al., 1999; Porcari et al., 1998; Thayer, 1987; Thayer et al., 1993) also suggested that Qigong exercise would perhaps display an association with affective benefits.

The continued study of Qigong-related affective responses is important for a number of reasons. In addition to commencing studies in a new field of research, the increasing interest from the public in mind-body therapies (Kelner & Wellman, 2000; Landstingsförbundet, 2000; Wolsko et al., 2004) is indeed an important incentive for further study. Studying acute (positive) affective responses appeals to researchers, because most people want to be happy or experience subjective well-being. Physical activity is often recommended for the enhancement of mental health (FYSS, 2008). However, not everyone (e.g. the elderly) is able to engage in higher-intensity activities, and some may not like it. In studying affective responses to Qigong exercise we may find new ways for people to increase their health and well-being. From a theoretical standpoint, studying Qigong, which includes both mindful (relaxation and meditation) characteristics and physical activity, is a fascinating prospect. Thus, the continued study of the acute affective responses to qigong exercise may provide promising benefits in the areas of positive affect and subjective well-being (Fredrickson, 2000), affect regulation (Wallace & Shapiro, 2006), and managing and reducing physiological and psychological arousal (e.g., stress; Gunnarsson, 2004).
Rationale for the present thesis

The study of Qigong-related acute affective responses is a fairly new avenue of research. A very limited number of studies had been carried out prior to the present thesis. Given the similar research context, I chose to study Qigong from an exercise psychology perspective. Although there may be some dissimilarities between, for example, jogging and Qigong (the foremost being the focus on the mindful intention in Qigong), the physical activity part is included in both exercises and may allow for the use of similar ways of study. Perspectives and methodologies in the present thesis are therefore influenced by the area of exercise psychology.

Given the rather broad population of Biyun Qigong exercisers in Sweden, I chose to commence my investigations at the annual Biyun Qigong training camp, which takes place a few days every summer. This meant having the opportunity to meet up to a hundred Qigong exercisers at the same time and place. All members of the Green Dragon (the member association of Biyun Qigong in Sweden) who have taken a course in the basic qigong form (Jichu Gong) are welcome to attend the camp, which includes lectures on Qigong and TCM, Qigong exercise, and meeting others interested in Qigong.

Jouper and colleagues published a study on the demographics of the members of the Green Dragon (Jouper et al., 2006), showing a majority of women in the association: In 2007 there were 102 men and 1348 women (G. Jacobson, personal communication). The majority of members have a university degree (57%), and have completed an average of four (SD = 4) qigong courses. At the time, 44% were employed, 45% retired, and 11% students. They are an active group, engaging in other physical activities 4.2 (SD = 2.9) times a week. The reasons for beginning Qigong exercise are mainly curiosity, but also to find a means of promoting personal health and recuperating from illness. Reasons for continuing to practice include feelings of personal well-being and physical health preservation (Jouper et al., 2006). The members of the Green Dragon display means in the middle range (unpublished data) compared to norm means for Antonovsky’s Sense of Coherence Scale (Antonovsky, 1991), and
Ryff’s Psychological Well-Being Scales (Lindfors, Berntsson, & Lundberg, 2006; Ryff & Keyes, 1995).
AIM OF THE THESIS

The aim of the present thesis is to study Qigong-related acute affective responses in a group of regular exercisers. Affective responses will be assessed on different levels of the affective hierarchy: from the level of affect to moods and emotions, using corresponding self-report measures. Further, through the use of mean scores, individual responses, and open-ended questions, the affective Qigong experience will also be studied. Assessments will be made before, during, and after the Qigong bout. Specifically, the following research questions are posed in the thesis:

- Are the acute affective responses associated with Qigong exercise significantly different from a control condition?
- Are the acute affective responses associated with Qigong exercise dependent on the length of the session?
- Is there a relationship between acute affective responses and positive expectations of affective benefits?
- How are affective responses displayed and how do they change, from pre-, to during, to post-exercise, using means and individual responses?
- How do the exercisers describe their experience associated with Qigong exercise, during and after the session?
STUDIES

Study I


Introduction

Today, stress causes widespread ill health, demonstrated by increased rates of musculoskeletal disorders, anxiety, and depression (Bergdahl & Bergdahl, 2002; Krantz, & Lundberg, 2006; Ursin, 2000). Increasing evidence points to the benefits of using physical activity and mind-body therapies (e.g. Yoga, Tai Chi, and Qigong) as a means for managing and alleviating stress by improving mood and reducing anxiety (Berger & Motl, 2001; Granath, Ingvarsson, von Thiele, & Lundberg, 2006; Petruzzello, Landers, Hatfield, Kubitz, & Salazar, 1991; Wolsko et al., 2004). Chinese traditions have emerged with a method, Qigong, which combines slow movements, relaxed breathing, and deep mental focusing. Studies show that Qigong may increase the overall health and well-being of the exerciser (Lee, Ryu, & Chung, 2000; Mayer, 1999; Ryu et al., 1995). Acute affective (mood and emotional) responses to single sessions of Qigong exercise are fairly limited, yet one study (Lee, Kang, Lim, Lee, 2004) reported reduced anxiety after one hour of Qigong exercise. Given that everyone does not have the time to engage in an hourly Qigong bout, it would be interesting to investigate whether a 30-minute bout would also yield positive affective benefits. The aim of the present study was therefore to study the acute effects on mood and anxiety after 30 minutes of Qigong exercise, compared with a control condition.

Method

Participants at a Qigong camp were asked to participate, and those willing (59 individuals, 8 men and 51 women; 50.8 years of age, SD = 3.1) were consequently first
matched according to age, instructor versus exerciser, and gender, and were later randomized to a Qigong group or a control group (attending a lecture on Traditional Chinese Medicine by Biyun founder and Qigong master Fan Xiulan).

Mood and anxiety were measured using the Profile of Mood States (POMS; McNair et al., 1992) and the state form of the State and Trait Anxiety Inventory (STAI; Spielberger et al., 1983). The POMS consists of 65 items assessing six affective states: tension/anxiety, depression/dejection, anger/hostility, vigor/activity, and confusion/bewilderment. The respondents rate their feelings on a five-point (0-4) intensity scale; the question “How are you feeling right now?” was chosen. The POMS has been validated by different groups of individuals: psychiatric outpatients and college groups (McNair et al., 1992), and adult and geriatric populations (Nyenhuis, Yamamoto, Luchetta, Terrien, & Permentier, 1999).

The STAI has been validated in a number of college student samples (Spielberger et al., 1970) and has strong psychometric qualities (Gauvin & Spence, 1998). The STAI comes in two versions, a trait and a state version. The state version (SAI) was used here. Respondents assess their level of anxiety on a four-point (1-4) intensity scale, ranging from Not at all to Very much so. The state version of the STAI consists of 20 statements.

Before and after the Qigong and control intervention, the POMS and the STAI were filled out. Initial t-tests on all dependent variables were used to rule out any pre-intervention differences. Separate mixed (Group x Time) ANOVAs for each dependent variable (7) were made. Alpha was set at .007 to reduce for type-I errors, due to multiple testing (Bonferroni correction).

Results and discussion

Pre-scores on all dependent variables showed no differences between groups. No gender differences were found in a comparison of pre-scores on the STAI and the POMS. Taken together, the two groups displayed reduced state anxiety (STAI), Tension, Depression, Fatigue, Confusion, and enhanced Vigor (POMS). Comparing the two groups, STAI, Depression, Anger, and Fatigue were reduced significantly.
more in the Qigong group (Tension, Confusion and Vigor changed more in the Qigong group, but not significantly).

The results of the study are discussed comparing different magnitudes of anxiety reduction with another Qigong study, and the influence of having regular exercisers in the study. Given that the control condition was attending a lecture by Qigong master Fan Xiulan, an important person to the individuals in the study, possible limitations and suggestions for future optimal control conditions are discussed. Thus it seems equally beneficial for the Qigong exercisers to listen to a lecture by the Qigong master on Tension, Confusion, and Vigor. In particular, the non-significant difference on the Confusion subscale (POMS) between the Qigong and control groups may be explained by the cognitive characteristics of the lecture. Possible active mechanisms for the effects on mood and anxiety are suggested by way of increased parasympathetic tone (focus on internal body, repetitive tasks and breathing; Recordati, 2003), elicitation of the relaxation response (Benson et al., 1975), Oxytocin secretion by way of self-massage (Uvnäs-Moberg et al., 2005), and by cultivation of positive emotions (the Broaden-and-Build Model; Fredrickson, 2000).

Study II


Introduction

Previous Qigong studies investigating acute anxiety responses show different magnitudes of reduction. Although not involving the same Qigong styles, a 60-minute bout of qigong exercise (Lee et al., 2000; 24% reduction) displayed a greater reduction in anxiety compared to a 30-minute bout (Johansson, Hassmén, & Jouper, 2008; 12% reduction). On the contrary, studies of physical exercise do not display greater affective effects after longer sessions of exercise compared to shorter ones (e.g. Daley &
The aim of this study was therefore to compare a 30-minute Qigong session with a 60-minute Qigong session.

Method
A matched (age, instructor versus exerciser, and gender) randomization was performed with regular Qigong exercisers at a Qigong summer camp who were willing to participate in the study (N = 41). Participants (35 women and 6 men; 56.7 years of age, SD = 12.4) were allocated to a repeated measures cross-sectional design. On the first day, one group began with 30 minutes of exercise and the other with 60 minutes of exercise. On the following day conditions were reversed, resulting in all participants taking part in both conditions and a controlling for order effects. Measures of mood (POMS; McNair et al., 1992), state anxiety (STAI; Spielberger et al., 1983), and Affect (self constructed one-item scales, end points representing Highest possible and Lowest possible, measuring Activation and Valence). See Study I for psychometric properties of the POMS and the STAI. Separate 2 x 2 within-subject ANOVAs were carried out for each dependent variable (9). Type-I error was protected by Bonferroni correction, setting alpha-level at .006. Given that the depression subscale of the POMS has been used as a screening instrument for depression (Griffith, Szafiarski, Kent, Schefft, Howe, & Privitera, 2005), participants with scores of more than 1 SD above the norm of healthy females (McNair et al., 1991) were excluded from subsequent analysis (five individuals).

Results and discussion
All measures (except Activation) displayed significant beneficial changes. No significant differences (p < .006) on the six subscales of the POMS, the STAI, and the self-made measures of Affect, in the magnitude of changes, were found when the two conditions were compared. Both conditions, 30 and 60 minutes, displayed significant beneficial psychological changes (except on Activation). A longer Qigong session therefore does not induce greater psychological responses than a shorter session.
does. Many people report having limited time to engage in an exercise regimen; it is therefore positive that a short session (30 minutes) is enough to induce positive psychological responses of the same magnitude as a longer one (60 minutes).

The Relaxation Response (Benson et al., 1975) has been suggested as a possible active mechanism for the beneficial effects on affective states, associated with Qigong and mind-body therapies. The results of this study are discussed in light of the fact that regular Qigong exercisers may be more skilled and thus require less time to elicit the Relaxation Response, and therefore similar affective benefits in both the 30 and 60-minute conditions. Further, the equivocal results of Vigor but not Activation being significant are proposed to be due to the POMS being a validated instrument while the wording of the Activation measure may have an influence. A point is also made in Study II regarding the narrowness of the present perspective. The focus is on acute affective changes. Qigong exercise is not focused solely on improving affective states, but rather on the continuous daily work of improving health for the whole individual: physiologically, psychologically, spiritually, and energetically. Jichu Gong is the first Qigong maneuver the beginner learns, and Dong Gong is the second. These two different maneuvers have different aims, according to Fan (2000), and cannot really be compared. The success of Dong Gong practice is dependent on some experience of Jichu Gong; it is actually recommended that the student practice Jichu Gong daily for three months before learning Dong Gong (Fan, 2000). In the 30-minute condition Jichu Gong was performed, and in the 60-minute condition Jichu Gong and Dong Gong were performed. However, from a perspective of affective regulation, a single session of 30 minutes of Qigong exercise may give the exerciser a boost in positive mood. In future studies, one should observe even shorter bouts of Qigong exercise to see if they also provide affective benefits. The focus of Study II is on people reporting not having time to exercise, and therefore studies shorter bouts to determine whether they are as beneficial as longer ones.
Study III


Introduction

In this study we wanted to extend and develop ways of studying acute affective responses to Qigong exercise, which have not previously been done, and adopted recent recommendations from exercise psychology. Hence, we chose to study affective responses by way of a dimensional perspective on the level of affect, employing assessments before, twice during (10 and 20 minutes), and after exercise. In addition to studying average mean scores, we presented individual scores to show the individual variation in affective changes. This perspective has been proposed by a number of researchers (Backhouse, Ekkekakis, Biddle, Foskett, & Williams, 2007; Van Landuyt et al., 2000) and may more realistically display the variations in affective responses during and following physical activity. This is a new and more realistic perspective on the classical idea that exercise makes you feel better, which has been criticized for being too simplistic and may have been detrimental in making people become more physically active. Given that placebo or positive expectations have been associated with Tai Chi (Jin, 1992), we chose to study a possible relationship with the actual affective outcomes. Finally, open-ended questions were employed to allow the participants to describe affective experiences associated with Qigong.

Method

Forty-six women chose to participate in the study, out of 88 attending participants (men and women) at a Biyun Qigong summer training camp. Mean age was 59 years (SD 9.2). We chose to study affect from a dimensional perspective using a modified version of the short Swedish Core Affect Scale (SCAS; Västfjäll et al., 2002; Västfjäll & Gärling, 2007). We thus measured affect in four dimensions: Unpleasantness-Pleasantness, Deactivation-Activation, Unpleasant Deactivation-
Pleasant Activation, and Unpleasant Activation-Pleasant Deactivation (See Figure 2). The SCAS was validated and determined to be a reliable measure of the dimensions of the affect circumplex (Västfjäll et al., 2002). As affect is assessed on only two dimensions in the short version (Västfjäll & Gärling, 2007), we included the extra two (rotated in italics) that are included in the original version (Västfjäll et al., 2002), while keeping the rating format of the short version (for multiple assessments). As such, respondents rated their present affective state in a bipolar rating format (1-9). Thus, affective responses could be assessed on four dimensions (as recommended by Larsen & Diener, 1992).

In addition to tracking affective responses as mean averages, we studied inter-individual responses on the Unpleasantness-Pleasantness dimension on the SCAS. This was done from Pre- to In-task 1, and to In-task 2, categorizing responses according to Positive, Negative, Fluctuations, and No change (Rose & Parfitt, 2007); see Table 1. Inter-individual responses were also measured in a similar manner between each assessment (including post-measurement).

A Swedish version of the Beliefs Concerning Mood Improvements Associated With Running Scale (O’Halloran, Murphy, & Webster, 2002) was administered to measure beliefs regarding positive expectations related to Qigong exercise, and correlations (Pearson) with actual outcomes were calculated. The scale consists of five items measuring expected mood changes during exercise, and two items assessing expected mood changes after the bout. Scores on the two subscales were calculated using mean scores of the items belonging to each subscale (possible scoring on each subscale 1-5). Examples of statements include “I experience feelings of improved mood during a session of Qigong”. The authors report satisfactory internal consistency (Cronbach alphas = .77 and .86 respectively).

To measure perceived exertion, the Borg scale (6-20) of perceived exertion (RPE) was used in Study III. The scale ranges from No exertion at all (6) to Maximal exertion. Psychometric information can be found in Borg (1998).
The participants were also told to describe the experience and how they generally feel during and after a Qigong session. Adjectives describing how they feel were grouped into the eight end points of the circumplex structure of affect, by way of quantitative content analysis (Berg, 2001).
Four separate repeated measures ANOVAs were carried out for each affective scale on the short modified SCAS. *Post hoc* tests (t-test) were employed when ANOVAs were significant. The Bonferroni correction was employed to correct for the risk of type-I error, setting alpha at .01. When violations of sphericity were detected, Greenhouse-Geisser corrections were used.

**Results and discussion**

Significant increases of affect (on repeated ANOVAs) between each assessment (Pre-In-task 1, -In-task 2, and Post) were found (p < .01). Significant changes were found (p < .01) between each assessment and every dimension (Bonferroni corrected t-tests) on the SCAS, resulting in a shift toward increased Pleasant Activated and Deactivated affect. However, the Unpleasantness-Pleasantness dimension did not display significant affective benefits between Pre- and In-task 1. A recommendation is therefore that for affective benefits to be significant, the duration should not be shorter than 20 minutes.

In a comparison of individual scores before and during, the majority of responses indicated positive affective change, followed by no change. Further, studying changes between single assessments, a majority of participants first show (Pre- to In-task 1) no affective changes; some individuals report positive affective changes and some report negative changes. In the two following comparisons (In-task 1 to In-task 2 and In-task 2 to Post), individuals showing increased positive affect increase and dominate, while participants showing no changes decrease. Responses in the direction of more negative affect decrease to a minimum. When comparing Pre with Post, 87% report increased Pleasantness and no individual reports increased Unpleasantness. Thus, inter-individual affective patterns of change during Qigong exercise display favorable affective changes for most individuals, particularly at the end of the bout.

Positive expectations with actual affective outcomes were only significant for one dimension of the four scales of the SCAS. The Unpleasant Activation-Pleasant Deactivation dimension was significantly correlated with expected mood outcomes at post-measures (.31).
The results of the open-ended questions display a uniform positive affective experience, yet this may vary. Most individuals report affective experiences associated with Pleasant Deactivation, followed by Pleasantness. The most common combination is Pleasantness and Pleasant Deactivation. Individuals also report beneficial changes associated with cognition, bodily experiences, altered states of consciousness, and increased well-being. The simultaneous increased activating and deactivating pleasant state, visible in the modified short SCAS, could not be seen here. During Qigong, perceived exertion was rated at a mean average of 10.1, which can be found between very light and light on the Borg scale.

These results were found despite the fact that the participants were interrupted twice during the Qigong session. Qigong is advocated to be carried out without interruption, and some participants displayed irritation at having to assess their affective state during the bout. It is possible that without the stops the affective responses would have been even more positive. Some limitations of the study are mentioned, including the absence of a control group in addition to self-selected participants at a Qigong camp. Possible practical benefits are discussed and the pleasant affective state reported by the qigong exercisers may have important value for adherence, subjective well-being and fostering personal resources and positive affect in the future.
Table 1. Study, design, measurements, and results of the three studies of the present thesis.

<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>Measurement</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Repeated randomized controlled</td>
<td>Profile of Mood States, The State Anxiety Inventory</td>
<td>All subscales of the POMS, and STAI, increased in the Qigong condition, yet only Depression, Anger, Fatigue, &amp; State anxiety (STAI) were statistically more beneficial compared to the control condition</td>
</tr>
<tr>
<td></td>
<td>N = 59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Repeated cross-over design</td>
<td>Profile of Mood States, The State Anxiety Inventory, Self-made scales of Activation &amp; Valence</td>
<td>POMS, STAI, &amp; Valence similarly beneficial for the 30 and 60 minute conditions</td>
</tr>
<tr>
<td></td>
<td>N = 41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Repeated design (Pre, In x 2, Post)</td>
<td>Short modified Swedish Core Affect Scale, Inter-Individual frequencies of the P - UP, Perceived Exertion, The Beliefs Concerning Mood Improvements Associated with Running Scale, Open ended questions on experiences and feelings during &amp; after the session</td>
<td>Assessments increasingly more Pleasant, Pleasant Activated, Pleasant Deactivated, &amp; Activated as the bout proceeds. Individual responses first display mostly No change, some Positive, and few Negative. Later Positive increase and dominate, followed by some No change and very few Negative. Perceived exertion as Very light to Light Only one out of eight possible correlations significant between expectations and affective outcomes. Open ended questions are mostly Pleasant Activated and Pleasant.</td>
</tr>
<tr>
<td></td>
<td>N = 46</td>
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</tbody>
</table>
GENERAL DISCUSSION

Main findings

The aim of present thesis was to study Qigong-related acute affective responses in a group of regular Qigong exercisers. In the three studies this has been done on different levels of the affective hierarchy: basic affect, mood and emotion. Affective responses show uniform benefits on all levels (however not significantly more beneficial than listening to a lecture on all mood states of the POMS; Study I). Benefits are independent of training session length (30 and 60 minutes; Study II). Affect is significantly improved during the bout, beginning with small changes, and greater at the end (Study III). In line with the Dual-Mode Model (Ekkekakis, 2004) Qigong’s low intensity characteristics create beneficial affective responses in the majority of individuals (Study III). When responding to open-ended questions of what respondents usually feel and experience during and after a Qigong session, reports are mostly of Pleasantness and Pleasant Deactivation in nature, somewhat in contrast to those measured by the modified short SCAS, in which a simultaneous pleasant activating and deactivating state were reported.

Complementing the few studies of acute affective responses to Qigong exercise (Lee et al., 2004; Kjos & Etnier, 2006), the present thesis strengthens the scientific knowledge in this area. Acknowledging some important limitations, more evidence has now been gathered for the effectiveness of Qigong exercise, as a means for improving affective states.

Research questions

Are the affective responses associated with Qigong exercise significantly different from a control condition?

Study I showed that State Anxiety, Depression, Anger, and Fatigue were significantly better compared to the control group, whereas Tension, Confusion, and Vigor were not (although pre-post comparisons were greater in the Qigong group). Studies of
physical activity display significantly better acute affective benefits compared to a control group (e.g. Ekkekakis et al., 2007). State anxiety showed a significantly better reduction from Qigong compared to sham Qigong (Qigong without the mindful focus; Lee et al., 2004), and this superiority of mind-body therapies compared to controls is also shown elsewhere (Berger et al., 1988; Berger & Owen, 1992; Netz & Lidor, 2003). There are also examples of the opposite: Morgan and Bahrke (1979) found the anxiolytic effects of Relaxation Response meditation similarly beneficial to silently sitting in a chair. Thus, the answer to this question is partly positive; yet, probably due to the choice of control group (a better choice would have been silent sitting), it cannot be concluded that Qigong exercise is more effective in decreasing Tension and Confusion, and increasing Vigor, and further studies are needed with more appropriate control groups.

*Are the affective responses associated with Qigong exercise dependent on length of session?*

Comparing affective responses to the two different durations (30 minutes of Jichu Gong, and 60 minutes of Jichu Gong and Dong Gong) in Study II, results of the STAI (state anxiety), the six POMS subscales, and the self-constructed measures of Hedonic tone (valence) and Activation, all showed non-significant results. Thus, for the sample in this study, the results imply that acute affective benefits of Qigong are independent of duration. Yet, as Fan Xiulan reasons (Personal communication, 2009-01-21), Jichu Gong and Dong Gong are different forms and have different aims, and it is therefore likely that experiences from the two would be different. Hence, according to the results based on the scope of instruments of the present study, similar effects were found, but it is possible that with different instruments or with a qualitative approach, differences between the 30 and 60-minute bouts would have been found (perhaps even more so if Jichu Gong had been compared with Dong Gong). To my knowledge, affective benefits of mind-body therapies of different durations have not been studied, but the result of the present thesis is in line with results from comparisons of physical activity of durations from 10 to 30 minutes.
From an acute affective perspective, practical benefits entail allowing those with little time to engage in activities (often a reason for not exercising; King et al., 2000) to be sure of benefitting to a similar extent from a shorter session compared to a longer one.

Is there a relationship between affective responses and expectations of affective benefits?

Given the characteristics of Qigong exercise, suggesting extra strong placebo effects, an association between expectations and actual outcomes was expected. However, on the four scales of the modified short SCAS that were compared to expectations of affective benefits during and after the actual Qigong bout, it was only in the Unpleasant Activation-Pleasant Deactivation dimension where a significant correlation with expected mood outcomes at post-measures was found. The reason for this may be partly due to different affective measure and activity (P. D. O’Halloran, personal communication, February 25, 2008) than previously reported correlations between mood and expected mood outcomes in the literature (O’Halloran, Murphy, & Webster, 2002; O’Halloran, Murphy, & Webster, 2005). A ceiling effect, with the majority of individuals showing positive expectations regarding possible Qigong-related affective benefits, may also be responsible for the absence of significant correlations. In addition, O’Halloran et al. (2002) used young runners to validate the scale, in contrast to the older sample of the present thesis. On the contrary, the significant association with increased Pleasant Deactivation may be how the relationship between positive expectations and Qigong-related affective outcomes is displayed.

Thus, from the results of Study III, one could conclude that a significant relationship between positive expectations and affective outcomes was only found in one (increased Pleasant Deactivation at post-assessments) of eight comparisons. It seems reasonable that there should be more significant relationships based on theoretical suggestions (Lund, 1987), empirical findings of somatic focus (Geers et al., 2006) in addition to Tai Chi (Jin, 1992), and jogging (O’Halloran et al., 2002). Apparently,
this issue cannot be resolved at this time, and clearly needs more research in which choice of participants, self-reports, and research design are of great importance.

*How do affective responses display themselves and change, from pre-, to during, to post-exercise, using mean averages and individual scores?*

Based on the results of Study III, all the dimensions of the modified short SCAS first show small positive changes, which later increase as the session proceeds (one of the dimensions does not display significant changes comparing Pre and In-task 1). However, Unpleasant Activation-Pleasant Deactivation instead shows the greatest change at the beginning, reasonably due to the relaxation phase at the beginning of the Qigong session. The pattern is thereby more closely related to that of the Maintenance Model (characteristic of low-intensity exercise) than the Rebound Model (characteristic of higher intensity exercise; Bixby, Spalding, & Hatfield, 2001). According to the maintenance model, affective benefits are proposed to level out into a plateau. This does not happen, however; instead, affective benefits increase until the last measurement. Extra post-measurements could have shown the lingering effects of the affective responses.

Individual responses on the Unpleasantness-Pleasantness dimension from Pre to In-task 1 and to In-task 2 show 61% of individuals categorized as Positive, 7% as Negative, 7% as Fluctuations, and 26% as No change. The few individuals reporting increase in negative affect (7%) are in stark contrast to the 26% presented for self-chosen moderate intensities of jogging (Rose & Parfitt, 2007), which is also predicted for low-intensity exercise (in comparison with moderate intensities) in the Dual-Mode Model (Ekkekakis, 2004). Comparing each measurement, the majority first display No changes, followed by Positive, and a few Negative. As the session proceeds this changes, and in the end the majority display Positive responses followed by No change and a minimum of Negative responses. Comparisons between Pre and Post displayed 87% of the individuals reporting increased Pleasantness and non-increased Unpleasantness. Despite the select group of study (regular Qigong ex-
ercisers), it is interesting to see the dominating positive affective responses, which was very different from a study of regular joggers (Rose & Parfitt, 2007).

How do the exercisers describe the experience associated with Qigong exercise, during and after the session?

This enquiry was addressed in Study III through open-ended questions. Affective descriptions and adjectives were analyzed by way of categorization into the eight poles of the affect circumplex (See Figure 2). Although there may be some limitations to the conclusions that can be drawn from two open-ended questions, all participants report that they associate Qigong exercise with a more beneficial affective state. Reports were similar in response to open-ended questions during and after Qigong. The most common categorizations are Pleasant Deactivation and Pleasantness. These are also the most common dimensional combinations (same individual describing in both dimensions). Some, albeit just a few, report simultaneously experiencing being activated and deactivated (as the results of the modified short SCAS suggest). In addition, people also report experiences that are not directly transferrable to the circumplex structure of affect, such as clearer thoughts (cognitions), feeling warm and soft in the body (somatic experiences) and being one with everything (altered states of consciousness), as well as feeling love, harmony and healing, and feeling light and free. These statements are in concordance with qualitative studies of Qigong, reporting mental strength, relaxation, reduced mental tension, and feeling refreshed and energized (Wenneberg, Gunnarsson, & Ahlström, 2004), and feeling at ease with themselves, calm, centered, and refreshed for the day (Brinker, 1998).
Methodological issues

Participants

Studies I, II, and III took place at the annual Biyun Qigong summer camps, during 2003, 2006, and 2007. Given that many individuals return every year to the camp it is likely that at least some individuals took part in all the studies of the present thesis. Thus, a specific select group participated in this thesis.

In Studies I and II there was a majority of women (9-14% men) and in Study III only women were included. There is a dominating majority of women in the Green Dragon (1348 women and 100 men in 2007; G. Jacobson, personal communication). An American survey (Wolsko et al., 2004) displayed a slight majority of women reporting mind-body therapy usage, but in a study of Swedish individuals engaged in different kinds of New Age groups (meditation, personal and spiritual development, Yoga, etc.) there is a large majority (83%) of women (Frisk, 1998). There are suggestions as to why especially women are highly attracted to these environments. One refers to women actively seeking out non-patriarchal environments that are more pro-women. Another refers to the focus on feelings, intuition, communication, and relationships (more than intellect and dogma) that is found in these alternative therapies and communities. These characteristics are considered feminine in our society, and women may therefore feel more attracted than men (Frisk, 1998). Gender differences were initially compared on all dependent variables at pre-measures (Studies I and II). While no statistical differences were found, means were collapsed for gender in subsequent analyses. Gender differences were not studied any further.

In most studies of physical activity and mental health, volunteers are employed, and this creates some problems (Morgan, 1997). For example, studies of acute affective responses to Tai Chi (Jin, 1989), Qigong (Kjos & Etnier, 2006), and other forms of mindful exercise (Netz & Lidor, 2003; Szabo et al., 1998) employed self-selected volunteers from existing exercise classes. The samples of the three studies of the present thesis were drawn from regular Qigong exercisers attending a Qigong Summer Camp.
It is possible that when beginning Qigong exercise, those who found the activity affectively positive adhered, and that those who did not, quit. Thus, the experienced sample of the present thesis may possess certain qualities that predispose them especially to the beneficial effects of Qigong exercise. Further, those who choose to attend a Qigong summer camp have the economic means and the social possibility of attending (leaving family and children at home), in addition to probably being positive about Qigong. This may limit external validity, or the possibility to generalize the results to other groups of people. However, it seems important to emphasize that, despite the fact that the sample consisted of regular Qigong exercisers (with a number of years’ experience) attending a Qigong summer camp (and meeting friends), the results still show significant beneficial affective responses in all three studies. One could perhaps imagine that the sample was already in a pleasant affective state and that room for improvement was thereby limited.

**Design**

The benefits of conducting a study at a Qigong camp include encountering a large number of Qigong exercisers at the same time and place. However, this quasi-experimental setting also created some restrictions, including a loss of control over the experimental setting, and having to somewhat adjust my research to the context of the camp.

In Study I, the Qigong intervention was compared to a control group; in Study II, the participants served as their own controls; and in Study III no control group was used as the focus was on affective responses during the Qigong bout (See Table 1).

Given that a control group should be as similar to the experimental condition as possible but without the treatment (Whitley, 2002), the choice of control condition in Study I presents some limitations. A more suitable control condition would have been silent sitting, a non-mindful exercise or relaxation. Also, due to the probable affection that the Qigong exercisers may possess for the master of the Qigong method, it is possible that Qigong exercisers lacking this affection or those simply...
listening to an unknown lecturer about Qigong would have displayed different effects. As Study I was carried out at the Qigong summer camp, and to avoid disrupting the camp schedule too much, a different control condition was not possible. At some times the experimental designs (as recommended in exercise psychology for physical activity; Ekkekakis & Petruzzello, 1999) interfered with the way Qigong is normally advocated to be performed, as in Study III when participants were interrupted during Qigong to rate their affective state (although it did significantly increase affective benefits). Perhaps not optimal according to Qigong philosophy, it did provide some important new results. In future Qigong studies, care should be taken to recruit a relevant control condition.

Procedure

A number of biases can be associated with intervention studies (Morgan, 1997). The issue of self-selected participants was discussed above. This may increase the possibility of demand characteristics (the participants figure out the purpose of the study and try to respond accordingly). Precautions were taken to minimize demand characteristics by describing the purpose of the studies as “examining Qigong-associated psychological responses”. In Studies I and II, some reduction of the Hawthorne effect (Morgan, 1997) was possible as both groups/conditions received the same amount of attention. These possible biases need to be taken into consideration when evaluating the results of the present thesis.

Biyun Qigong consists of a number of specific forms of Qigong. Jichu Gong, the basic form, was used in all three studies. However, in Study II, the shorter condition (30 min) consisted of Jichu Gong and the longer condition (60 min) consisted of Jichu Gong and Dong Gong performed together. Dong Gong is the second Qigong form taught to students of the Biyun School. Qigong is practiced to improve health on psychological, physiological, spiritual, and energetical levels. Founded in the principles of Traditional Chinese Medicine and Qigong philosophy, certain training requirements are advocated for safe and optimal Qigong training. Examples are optimal training dose and regularity. Fan Xiulan of the Biyun School emphasizes build-
ing from the ground up (2000). This means starting with softening the joints of the entire body, a prerequisite for a healthy flow of qi. When one has become more accustomed to and has opened up for the qi flow, other more advanced forms of Qigong techniques may be performed, such as moving qi through the body. However, this is based on the joints of the body being opened. As all forms consist to a certain degree of similar characteristics (e.g., relaxation and meditation) affective responses ought to be similar, whichever form one chooses to study. Yet there may also be variations. Hence, it is important to know that the results of this thesis are based on the most basic Qigong forms of the Biyun School.

**Measures**

The present studies employed self-report measures to investigate affective states associated with Qigong exercise. The procedure of rating one’s affective state implies that the individual is consciously aware of her own emotional state, which may not always be the case (Swinkels & Guiliano, 1995). Further, by directing attention to an unconscious mood state the procedure may influence what it intends to study. This may also lead to an urge to regulate one’s mood state (Parkinson et al., 1996). Some other important possible biases associated with self-report scales (Watson, 2000) are: Social desirability may influence individuals to report more positively than what they actually experience, as they do not want to admit to having a negative mood or experiencing anxiety. Individuals may want to cooperate and therefore report in a way that they expect the experimenter wants them to. In addition, many of the individuals in the present thesis have years of experience of the benefits of Qigong, and consequently may want the results to be positive as well as make them more prone to the benefits of Qigong. This may cause individuals to expect benefits from the activity studied. At all times, I have urged the participants to respond as truthfully as possible. Another bias in self-report measures concerns how respondents interpret the anchoring points of scales. They may not be comparable between individuals, but they are analyzed as comparable (nomothetic approach).
Despite the mentioned disadvantages of self-report measures, they have been the main source of data gathering in the three studies of this thesis. Given that the focus of the thesis is on the conscious, subjective experience, self-report measures are the most sensitive and discriminating way of data gathering (Larsen & Fredrickson, 1993; Parkinson et al., 1996; Thayer, 1989).

In the three studies, affective states have been assessed from a level of emotion (the State and Trait Anxiety Inventory; Studies I and II), from a level of mood (categorical perspective) using the Profile of Mood States (Studies I and II), and from an affect level using a self-made affect scale (Study II) and a modified version of the short Swedish Core Affect Scale (Study III). More specifically, in Study I, the STAI was used to compare with a study by Lee and colleagues (2000) that used the same measure. Interesting results (different magnitude of state anxiety reductions between the two studies) led to the use of the STAI in Study II also. The state form of the STAI measures anxiety.

The STAI has been criticized in the context of measuring affective changes after bouts of physical activity (Rejeski, Hardy, & Shaw, 1991; Ekkekakis, Hall, & Ekkekakis, 1999), because an increase in activation is assumed to be related to or induced by anxiety. The measure may therefore yield some confusion in the assessment of changes in the context of vigorous exercise, as activation is increased in response to increased metabolism (and is not related to, e.g., increased fear). However, as Qigong exercise is a low-intensity activity (10.1 on the Borg scale), the risk of confusing anxiety with activation seems less pertinent (note that activation does increase by way of the Vigor subscale of the POMS, Study II, and on the modified short SCAS, Study III). Further, some argue that even though the state version of the STAI assesses emotion anxiety, due to the time it takes to fill out the measure it may actually measure a mood state.

The POMS was used in Studies I and II. Although it has been criticized for floor and ceiling effects (Gauvin & Brawley, 1993), too much focus on negative states (Gauvin & Spence, 1998), and not covering the entire affective experience (Backhouse et al., 2007), it is also the single most used mood measure in sport and exer-
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Exercise psychology (LeUnes & Burger, 1998). The POMS is therefore worthwhile in comparing the results with changes in other physical activities.

Finally, the SCAS (Västfjäll et al., 2002) provides a valuable complement as it is based on the dimensional view of affect and thereby covers the entire affective spectrum (the STAI measures a specific discrete emotion, while the POMS measures six discrete mood states). With the SCAS, the basic affective responses from a dimensional perspective can be assessed (note that the PANAS was used in a Qigong study by Kjos and Etnier, 2006, but the measure is limited to the high activated poles of the circumplex). The SCAS also measures affect, the most basic level of the affective hierarchy. See Figure 3 for the affective space covered by the POMS and the STAI in the circumplex structure.

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Figure 3. The STAI and subscales of the POMS, set in a circumplex structure. Adapted from Backhouse et al., 2007. The subscale Confusion of the POMS is left out.
Other affective measures could also have been used, such as the Activation Deactivation Adjective Check List (AD ACL; Thayer, 1978), or a Swedish version (Knez & Hygge, 2001), both based on the circumplex model of affect and covering the entire affective space. Assessments could also have been made with the Feeling Scale (Hardy & Rejeski, 1989) together with the Felt Arousal Scale of the Telic State Measure (Svebak & Murgatroyd, 1985), for multiple assessments during the bout (one-item measures).

In Study II, two self-made one-item scales were created to assess affect according to the circumplex structure (Russell, 1980). Thus, one scale set out to measure activation (from lowest possible to highest possible), and one scale to assess hedonic tone/valence (from lowest possible pleasure to highest possible pleasure). Taken in perspective, the “lowest possible…” and “highest possible…” wording may be a bit unfortunate as these extreme end points may make respondents reluctant to assess near the extremes, given the rather extreme phrase. For example, the Feeling Scale (FS; Hardy & Rejeski, 1989) uses “I feel very good” and “I feel very bad” as its extremes. Another example is the Swedish Core Affect Scale (SCAS; Västfjäll et al., 2002; used in Study III), in which extreme end points are only symbolized by highest and lowest numbers. It is possible that the non-significant change in Activation may be partly explained by the wording, as Vigor increased significantly, and Activation and Pleasant Activation (of the modified short SCAS) also increased significantly in Study III. Thus, some caution may be warranted in interpreting the results of the two self-made scales of affect in Study II.

In accordance with recent recommendations (Backhouse et al., 2007; Rose & Parfitt, 2007; Van Landuyt et al., 2000) in which the use of mean scores is complemented with that of individual scores, Study III displays single individuals’ affective responses associated with Qigong exercise. Specifically, a methodology presented by Rose and Parfitt (2007) was used. Thus, the Pleasantness-Unpleasantness scale on the SCAS was used to study individual scores. I believe that complementing with individual assessments gives extra strength to Study III and the present thesis by showing the variability between individuals and showing how affective patterns change during the Qigong session. This may be particularly essential in the context of
Qigong exercise, as many variables influence the experience and make it very individualistic.

**Statistical analysis**

Mixed (between-within, Study I), two-way repeated (Study II) ANOVAs, and repeated measures ANOVAs and t-test, Study III) were carried out in the studies. Non-parametric equivalents could have been used (e.g., Friedman) in Study II, however no non-parametric equivalent to mixed ANOVA exists. Parametric statistics were chosen because of their greater power to detect actual differences (Hassmén & Hassmén, 1996). However, sometimes abnormally distributed, sample sizes of the studies (N = 57, 41, and 46) assures robustness of violations (N > 30; Pallant, 2007). When multiple testing, Bonferroni corrections were employed to protect for violations of type-I error. If violations of sphericity were detected, Greenhouse-Geisser corrections were applied (Study III). Correlations (Pearson) were calculated in Study III. Samples were first screened and extreme outliers were deleted.

**Ethical considerations**

The three studies were designed and administered in accordance with recommendations by Forskningsetiska principer inom humanistisk-samhällsvetenskaplig forskning [Research Ethics Principles in Humanistic-Social Scientific Research] (Vetenskapsrådet, 2002). These demands were complied with by way of informing the participants that the purpose of the studies was to study psychological responses to Qigong exercise for research only, participants signing an informed consent form about participating voluntarily and having the possibility to quit the study at any time, keeping data locked up, and coding participants.

Study II was judged for ethical soundness by the Ethical Review Board of the Uppsala region. Given that Study II was judged to not be in need of ethical evaluation, Study III, of similar design, was not sent for evaluation. Before January 2004,
non-sensitive behavioral research was not deemed to require ethical review; thus Study I was not ethically reviewed by any board.
Concluding discussions

Affective changes associated with Qigong exercise

Based on the present thesis, a greater understanding of the affective responses associated with Qigong exercise is now emerging, contributing greatly to the field, in which, at the time the work on the present thesis commenced, Qigong had been found to only decrease anxiety (Lee et al., 2004). The understanding that is now emerging, however, shows greater clarity and depth concerning acute affective Qigong-related responses. Study III perhaps provides the greatest understanding of these affective changes, given that a dimensional perspective of affective states was used, thereby covering the entire affective spectrum. Following recommendations (Larsen & Diener, 1992) on assessing affective responses on both rotated and unrotated dimensions of the circumplex (See Figure 2), the perceived affective responses of the group of regular qigong exercisers display changes in the direction of greater Activation, Pleasant Activation, Pleasantness, and Pleasant Deactivation. This is perhaps an odd finding. Can one feel more enthusiastic and relaxed at the same time? This may be due to the assessment of all the eight end points of the circumplex of the modified short SCAS. This simultaneous activated yet deactivated pleasant state has been reported by individuals engaging in Transcendental Meditation (Wallace, 1970), in which reduced physiological activation was found to coexist with increased mental alertness, restful alertness. In Thayer’s mood model this is referred to as calm energy, and is associated with the use of Yoga and meditation (Thayer, 2001). A balance between activation and deactivation, fang song gong (characterized by awareness and tranquility, effortlessness, sensitivity, warmth, and rootedness) is also advocated in Qigong exercise. This is also closely related to the Taoist term Tai Chi – the balance point between yin and yang (Cohen, 1997), and descriptions of experiences associated with Qigong and other mind-body therapies (Dorcas & Yung, 2003). Could it be that a relaxed state of full alertness and heightened sense of awareness, in the context of Qigong, is related to a positive affective state? Descriptions of the Qigong state (Cohen, 1997; Dorcas & Yung, 2003; Fan,
2000), associated scientific theories (e.g. the Hypofrontality Hypothesis, Dietrich, 2003; Optimal Experience, Nakamura & Csikszentmihalyi, 2002; the Relaxation Response, Benson et al., 1975), and empirical findings in the present thesis, does suggest this. This may also correspond to a balance of the parasympathetic and sympathetic nervous systems, given the simultaneous activating and deactivating characteristics of Qigong exercise – being alert, yet experiencing an alleviation of the negative effects of physiological arousal.

Another advantage of using a dimensional perspective in Study III concerns the proposition of Yeung (1996) that mind-body methods may decrease negative affect but may not provide changes in the direction of greater positive affect as physical exercise may do (note the contrasting finding in the 2006 Kjos and Etnier Qigong study, in which Positive Affect increased but Negative Affect did not). Judging from the results of Study III, Qigong exercise is associated with greater affective benefits (of the present sample) in many directions, including increased Pleasant Activation and Pleasant Deactivation.

Further, Study III shows that Qigong exercise is related to greater Pleasantness not only post-exercise, which was found in Studies I and II, but also during the session. According to the Dual-Mode Model (Ekkekakis, 2004) low-intensity activities are proposed to provide greater pleasantness both during and after the session. The Dual-Mode Model also suggests that low-intensity activities show uniform changes in the direction of increased pleasantness for the majority of individuals, which was found in the inter-individual responses. Although, the Dual-Mode Model may provide for a greater understanding of low-intensity activities, including Qigong, there are also aspects of Qigong that are different from mere physical activity. The Dual-Mode Model proposes that in the context of low-intensity exercise, cognitive factors exert limited influence on affective outcomes. In the context of Qigong, on the contrary, it seems likely that cognitive factors (e.g., ability to direct ones attention) are essential for affective outcomes.

Other characteristics of the experience of Qigong-related affective changes entail a slow increase in positive affectivity. This change is evident after 10-20 minutes. This is related to that which is proposed for low-intensity activities according to the
Maintenance Model (Bixby et al., 2001). However, a plateau, which was expected some time into the bout as suggested by the Maintenance Model, was not found.

In Studies I and II, affective responses were assessed on a higher level in the affective hierarchy (except those of the self-made measures of valence and activation of Study II); on the levels of emotion (anxiety, the STAI) and mood states (the POMS). In both Studies I and II anxiety (STAI), Tension, Depression, Anger, Vigor, Fatigue, and Confusion (POMS) had significantly increased as measured before and after the bout. The contribution of using these measures also shows that the positive affective changes are uniform across different levels of the affective hierarchy.

When the affective Qigong experience is described in words (in the open-ended questions of Study III), the simultaneous activating and deactivating characteristics are not visible. Instead, most individuals describe it as Pleasant Deactivation and Pleasantness (actually, all individuals describe it as a positive experience). However, adjectives not directly fitting the eight end points of the circumplex structure of affect are also reported, like harmony, healing, stability, love, clearness of thought, increased sense of somatic focus, and feeling free and light. Thus, to allow for an understanding of the experience of Qigong, the basic affect level may describe it to some degree but not completely. To more fully understand the whole Qigong experience in relation to affective states, one may need to broaden the range of focus, and also include other areas related to beneficial states. This includes cognitive (thinking, appraising, and perceiving), conscious (the experience of awareness and altered states of consciousness), and somatic changes (bodily changes).

So how can the affective experience of Qigong be expressed? Based on a number of self-reports of mean scores and individual responses, and open-ended statements, a picture emerges. However, this picture is dependent on how the researcher chooses to assess affective responses. For example, in Study III the use of the SCAS shaped an affective picture in which the Qigong state was characterized by a simultaneous pleasant activating and deactivating experience. This would not have emerged if a different measurement had been used, for instance one scale assessing pleasantness and one measuring activation (solely the unrotated dimensions on the circumplex; see Figure 2), which is common in today’s exercise psychology studies (e.g. Back-
This was done in Study II, and resulted in increased activation (however not significant) and pleasantness. In contrast to this are the results of the open-ended questions, in which when the Qigong participants could freely describe their affective experience, most reported it as a pleasant deactivated state (e.g., relaxed and tranquil). Individuals may experience different feelings on a moment-to-moment basis; however, it is not likely that they would simultaneously experience both strong positive and negative feelings (Berkowitz, 2000). Such is not the case here; even though it is both activating and deactivating, the experience is pleasant.

Given that Qigong exercise includes energizing (e.g., stretching one’s arms over the head) and relaxing features (e.g., relaxation practice and slow movements), the somewhat diversified affective reports seem logical. Another explanation has to do with that the SCAS assesses affective responses on the specific session at hand, while the open ended questions ask for how the exercisers generally feel when performing Qigong (sessions may vary). A final possible explanation for the differences between results of the SCAS and those of the open-ended questions, in addition to open (questions) and closed (SCAS) response formats, have to do with that the exercisers rate their affective state based on different time spans. The SCAS uses a “right now” format, while the open ended questions were answered after the Qigong bout and focuses on the exercisers affective experience during the entire session. In addition, Qigong was associated with more beneficial mood states (Depression, Tension, Anger, Fatigue, Vigor, and Confusion; the POMS) and reduced anxiety (the STAI). Thus, to answer the question of how the affective experience of Qigong is characterized in the present sample of regular exercisers: It is pleasant. But this pleasant affective state varies somewhat depending on the individual and how it is measured.

A proposed model of mechanisms of affective benefits

In an earlier section, possible active mechanisms responsible for acute affective benefits associated with traditional physical activity and mind-body therapies were described. Now a model for suggested active mechanisms for acute affective responses will be presented (See Figure 4). It is important to note that this conceptual model...
Qigong characteristics
- Attention
- Relaxation
- Imagery
- Relaxed breathing
- Slow movements
- Self-massage

Active mechanism
- Focused narrow attention (absorption, Optimal Experience, the Relaxation Response, & an altered state of consciousness) by way of Hypofrontality Hypothesis creates a time-out from worries
- An optimal state of the autonomic nervous system (balancing the sympathetic and parasympathetic systems) by way of relaxed breathing, massage (oxytocin), cultivating positive emotions (Broaden-and-Build Model).
- Low intensive activities are beneficial as suggested by the Aanthropological Theory and the Dual-Mode model.
- TCM suggesting a release of emotions. Mindfulness - cultivates acceptance of the contents of consciousness.
- Placebo and expectations of positive affective outcomes based on earlier positive experiences, & mood congruency. Other possible mechanisms include social interaction and mastery/self efficacy

Individual characteristics
- Enjoyment
- Limited relaxation induced anxiety, stress, and ability to relax
- Finding the lifestyle and philosophy of Qigong attracting
- High on trait absorption/ability to concentrate

Affective response
- Beneficial affective states (affect, mood, and emotion)

Figure 4. A proposed model for acute affective responses associated with Qigong exercise.
was not tested empirically. Instead, relevant theories of possible active mechanism are discussed. Given that Qigong exercise includes a number of characteristics (attentional regulation, relaxation, imagery, breathing, self-massage, and slow movements) it seems reasonable that a number of different active mechanisms also work simultaneously (and probably in interaction) to provide for the beneficial affective states found in the three studies. Other models also exist. Tsang and Fung (2008) present a model of neurobiological pathways of anti-depressive effects associated with Qigong exercise. Anti-depressive effects may be influenced by increased brain serotonin synthesis, by reducing negative cognitive/affective signals to the brain (and reducing HPA activity), and by the down-regulation of cortisol (and promotion of neurogenesis in the hippocampus). See also Chow and Tsang for a similar model focused on anxiety reduction (2007). The present model presents some possible mechanisms that are not included in the Chow and Tsang model. The regulation of attention in the context of Qigong exercise refers to focusing on different parts of the body. This narrowing of attention may create a state in which the exerciser is absorbed by what he/she is doing at the moment (Davidson & Schwartz, 1976). Other suggestions concerning this state are presented as Optimal Experience (Nakamura & Csikszentmihalyi, 2002), deep concentration, an Alternative State of Consciousness (Vaitl et al., 2005), and the elicitation of the Relaxation Response (Benson et al., 1975). By way of the Hypofrontality Hypothesis (in which the prefrontal cortex, which segregates, differentiates, and analyzes our experience is down-regulated; Dietrich, 2003), a state of no thoughts and a unity with oneself and life is experienced, which may create a time-out from worries (Barhrke & Morgan, 1978). Another route is based on the effects of imagery (e.g. Astin et al., 2003), relaxed breathing (e.g. Philippot et al., 2002, relaxation (e.g. Scheufele, 2000), self-massage (oxytocin secretion; Uvnäs-Moberg, 2005) and the cultivation of positive emotions (Broaden-and-Build Model of positive emotion; Fredrickson, 2000). All these activities are related to increased parasympathetic nervous system activity (Recordati, 2003) and may create a more optimal state in the nervous system, absent from the effects of stress (Gunnarsson, 2004). As suggested by the Anthropological Hypothesis (Martinsen, 2002) and the Dual-Mode Model (Ekkekakis, 2005), low-
intensity activities are beneficial from an evolutionary perspective and may create positive affective experiences. Further, from a TCM perspective, Qigong may be a way to release suppressed emotions (Chen, 2008), and also includes an accepting attitude toward the contents of consciousness: mindfulness (Carrington, 2008). This may create a relaxed perspective on oneself and one’s life. It seems logical that placebo (Catanzaro & Mearns, 1999) and positive expectations (Lund, 1987) may also be responsible for Qigong-related affective outcomes, even though few significant correlations were found in Study III. The characteristics of Qigong suggest that expectations should play a role (Lund, 1987), as should memories of earlier positive affective responses to Qigong exercise, and may connect Qigong exercise with a positive affective state (mood congruency; Bower, 1981). In performing the sometimes difficult mental and physical maneuvers of Qigong, one may feel proud of the accomplishment by way of increased mastery (Sonstroem & Morgan, 1989) and self-efficacy (the ability to regulate arousal, affective states, complex bodily maneuvers; Bandura, 1982), and the act of regularly spending time on promoting one’s health may create increased self-love. A final suggestion is that of social interaction (Cox, Martin Ginis, & Petruzzello, 2006). Given that the designs of Studies I, II, and III were carried out in a group setting, it cannot be ruled out that social factors may have affected the participants; however, as most individuals belonging to the Green Dragon do perform Qigong regularly in their homes by themselves and receive affective benefits (Jouper et al., 2006), the social interaction hypothesis probably plays a minor role.

All the active mechanisms suggested above may, in interaction, provide for the affective benefits found in the three studies. A final factor also entails individual characteristics. To be able to adhere to Qigong exercise and receive affective benefits, it is probably important that an individual enjoys performing Qigong (Motl, Berger, & Leuschen, 2000), perhaps that the philosophy and lifestyle of Qigong seems attractive (Jin, 1992), and that the individual has the ability to relax (although this may be learned), and does not suffer from too much relaxation-induced anxiety (Heide & Borkovec, 1984) or any other severe psychiatric disorder (Ng, 1996). Finally, scoring high on the trait absorption may make it easier to enter the Qigong
state and thus obtain affective benefits (Weinstein & Smith, 1992), as may the ability to concentrate (Fan, 2000).

_Causality in the Qigong-affect relationship_

Acute affective benefits have been displayed in the three studies of the present thesis. Although it is not possible to infer a cause-effect relationship, whether Qigong _per se_ is responsible for the positive affective responses, I will speculate on this issue. A taxonomy of eight characteristics of inferring causality from mere association has been suggested by Hill (1965). Below these will be presented and discussed in the light of the present thesis:

- **Strength of association.** Based on a power analysis comparing effect sizes (eta squared) for interacting effects between the Qigong group and the control group of Study I, large effect sizes are found on significant measures and subscales: STAI, Depression, Fatigue, and Anger. Non-significant subscales (Vigor, Tension, & Confusion; Study I) and the self-constructed Activation scale in Study II showed too-low power (.30 - .60) for finding a difference (power > .80), and are thereby not valid for drawing any realistic conclusions. Effect sizes of the repeated measures differences (pre-post) of Studies II and III were all in the range of large to very large.

- **Consistency** (effect appearing in different individuals, places, and circumstances). Limited consistency is found in the present studies as a homogeneous sample (regular exercisers) is used and in similar settings (Qigong camp).

- **Specificity** (the influence of alternative explanations). Other variables may include social influence (not studied), certain individuals not being attracted to Qigong (not studied), and positive expectations/placebo (Study III found one out of eight possible significant correlations).

- **Temporality** (order of cause-effect between independent and dependent variables). Causality is supported by the increase in affective benefits occurring after the manipulation (Qigong). But given that the participants are self-
selected, it may be that they are an exclusive group that may react extra beneficially to the effects of Qigong exercise.

- **Plausibility** (whether causation is biologically plausible) and **Coherence** (cause-effect interpretation conflicting with generally known facts based on science). A number of theories based on the modalities used in Qigong exercise (e.g. parasympathetic associated behaviors, mimicking positive emotions, and narrowing of attention) support the biological plausibility of causality.

- **Biological gradient** (dose-response relationship). According to Study II, longer sessions of Qigong are not associated with stronger affective responses.

- **Experiment.** In Study I, Qigong exercise was compared with a control condition. However, the limited nature of the control group (attending a lecture by the Qigong master) restricts the benefits of the experimental design. That the attendance of a lecture by Fan Xiulan yields positive effects may not be surprising, given the importance of the Qigong master to the camp participants. Other forms of control conditions may have been better suited. This may entail sitting quietly and reading, meditating, or walking.

- **Analogy** (similar kinds of activities associated with effects). Walking (Ekkekakis et al., 1999), other Qigong (Lee et al., 2004; Kjos & Etnier, 2006), Tai Chi (Jin, 1989), Yoga (Berger & Owen, 1992), and relaxation (Saklofske et al., 1992) have shown beneficial affective responses.

To some extent, the taxonomy of Hill (1965) supports a cause-effect relationship. To more fully understand the cause-effect relationship between Qigong and acute affect, a randomized controlled trial should be employed that can strengthen scientific rigor in all parts of the design. In this vein, some limitations of the present thesis (self-selected regular Qigong exercisers at a Qigong camp and a somewhat limited control condition) may be bridged.
Is Qigong beneficial for everybody?

In a positivistic paradigm of research, the researcher wants to generalize the findings from the sample to include the entire (Qigong) population; this is also true here. However, some apparent limitations, self-selected participants at a Qigong camp being the most important, restrict the possibility to generalize the findings of the present thesis to other potential Qigong exercisers. The findings of this thesis should be seen mainly in the light of focusing on Qigong-related affective responses of a select, specific group of individuals who engage in Qigong exercise and probably find it enjoyable. This group is made up mainly of middle-aged women (The reason Qigong attracts women was discussed earlier). The present thesis may not resolve the question of whether men and women react differently to Qigong exercise, as one may suppose from comparing the study of Lee and colleagues (Lee et al., 2004) and the Kjos and Etnier (2006) study. Qigong and Tai Chi may be extra suited for health issues related to the needs of middle-aged and older individuals (Jouper, 2009; Tsang, Cheung, & Lak, 2002). Qigong is gentle, has flowing movements and fits individuals looking for a low-intensity activity and those unable to perform more vigorous activities (Kemp, 2004).

What about Qigong beginners? Would they benefit to the same extent that the regulars in the present thesis do? Given that Qigong exercise requires some time to learn the demands of visualization and bodily maneuvers, for beginning exercisers this may require so much effort that they may not be able to relax and benefit to the same extent as those who are more experienced. However, Fan Xiulan states that it is also possible for beginners to experience similar affective benefits as more experienced individuals do, if they are able to concentrate to the same extent during Qigong as those who are experienced (Personal communication, 2009-01-21).

With the limitations having been mentioned, a great effort has also been taken to study and understand which theories and suggestions have been proposed for how an activity like Qigong (and other similar) may provide for acute affective benefits for the exerciser. Similarly, a great effort has also been made to study the empirical support for acute affective benefits found in activities similar to Qigong exercise.
Qigong: Acute affective responses

Although they sometimes do not use proper scientific rigor (as in mind-body therapies; Ospina et al., 2007), many studies are promising (particularly in their support of physical exercise). From the perspective of the three empirical studies in the present thesis, generalizing the findings to other groups is somewhat limited. However, based on the other empirical studies, suggestions and theories of active mechanisms, it seems likely that other groups might also benefit from engaging in Qigong exercise.

Qigong – affective regulation and alleviation of physiological arousal?

Based on the proposed model of affective responses to Qigong exercise (Figure 3), a number of simultaneous processes may provide for affective benefits. On a daily basis, Qigong may function (for the participants in the present thesis) as an affect-regulating strategy and as a means for alleviating physiological arousal (e.g., induced by stressful events).

Qigong exercise can be associated with subjective well-being, which includes happiness or affective well-being, and how people view their world and themselves (Diener, Suh, Lucas, & Smith, 1999). Qigong may have a beneficial influence on both these factors. In the three studies, Qigong has been associated with positive affect. Being in a positive state of mind has numerous beneficial effects. By way of mood congruency (Parkinson et al., 1996), Qigong exercisers may view the world and themselves more positively and remember more pleasant memories (Forgas, Bower, & Krantz, 1984), thus experiencing more frequent positive moods as well as anticipating them occurring in the future. It has been found that the practice of meditation was able to produce future increased amounts of positive emotions and life satisfaction (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008). Further, frequent small incidences of positive affect have been shown to be more beneficial for subjective well-being than few strong emotional incidences (Diener, Larsen, Levine, & Emmons, 1985). Having a sense of meaning and purpose in life (Myers, 1992) is also important for subjective well-being. This can be provided by engaging in an activity (Qigong) that is also way of life and has spiritual connotations as well. Emmons ar-
gues that this entails enabling a person to create a new identity based on a life narrative focused around connections to a larger, transcendent purpose (Emmons, 1999). Thus, Qigong may provide for a potent means for affective regulation, in line with other methods like exercise and relaxation (Thayer, Newman, & McCain, 1994), thereby promoting a more pleasant affective state, possibly preventing psychiatric disorders (Gross, 1999), and improving subjective well-being.

Positive affect may influence other psychological variables. But does it also influence our physical health? Reviews point to the benefits of positive affect on physical health as well (Pressman & Cohen, 2005; Steptoe & Wardle, 2005). Qigong and Tai Chi have been found to stabilize the cardiovascular and autonomic nervous systems (Lee et al., 2000; Lee et al., 2002; Lu & Kuo, 2006), and Qigong may improve self-efficacy by way of arousal regulation (Bandura, 1982). Humans who were exposed to stressors were significantly more likely to experience hypothalamic-pituitary-adrenal (HPA) activation if the stressors were uncontrollable (Kemeny, 2005). Through the experiencing of positive affective states, the lingering harmful effects of physiological arousal (e.g., high blood pressure) have been found to alleviate at a faster pace (the Undoing Hypothesis; Fredrickson & Levenson, 1998). Thus, Qigong exercise may reduce physiological arousal, thereby removing the numerous harmful effects of stress on the body (Gunnarsson, 2004).

**Long-term benefits of regular Qigong exercise**

In their review of Tai Chi, Sandlund & Norlander (2000) conclude that it may not result in aerobic fitness but it may enhance flexibility and psychological well-being. I believe this is also a reasonable conclusion for Qigong exercise. Perhaps only aerobically enhancing for the old or physically impaired (very light or light on the Borg scale), the coordinated slow movements may increase balance and flexibility, and to some extent strength. Chen (2007) reports that common effects of the regular practice of Qigong are associated with a harmonious and relaxed state of mind and body, reduction in prior ailments, stress, increased resistance to illness, a heightened sensitivity to the body’s internal organs and an increased ability to regulate one’s
own health and vitality. Granqvist & Hjelm (1997) suggest that the regular performance of Qigong exercise may create greater self-awareness. When someone looks inward daily, the borders between conscious and unconsciousness processes may become less pronounced. Letting thoughts, emotions and memories pass through awareness may create an understanding of our own inner processes. This may lead to greater wisdom and insight into our lives and how they should be lived. The difference between tense and relaxed muscles becomes more visible. The slow, delicate (sometimes complex) movements can lead to a greater sensitivity of subtle bodily movements. Heightened awareness of healthy and detrimental postures, movements, and breathing patterns, and in general greater physical sensations from the body, may create a greater range of possibilities of how to take care of ourselves.

Other long-term effects (studies on meditation, which can also be compared to Qigong) include decreased sympathetic nervous system reactivity (by way of the Relaxation Response), thereby alleviating effects of stress (Hoffman et al., 1981), a more sensitive and varied emotional experience and an increased ability to discriminate between different emotional states (Nielsen & Kaszniak, 2006), and fewer negative reactions to stress as well as increased brain patterns associated with positive affect (Brefczynski-Lewis et al., 2007).

**Future studies**

When a new area or research is delved into, insights are reached that continuously improve the personal understanding of the area of research. To more fully understand acute affective responses associated with Qigong exercise, qualitative research designs would provide an important complement to the quantitative results found in the present three studies. Only a few published studies (e.g. Wenneberg et al., 2005) and master theses (Brinker, 1998; Murakawa, 2002) have investigated the experience of Qigong exercise through qualitative inquiries. For example, there were some equivocal results in Study III, in which self-report measures displayed simultaneous perceived activating and deactivating responses, however through the use of open-ended questions, most individuals described Qigong as relaxing (Pleasant Deactiva-
tion), and only a few described it as simultaneously activating. Further studies comparing/complementing qualitative with quantitative designs are needed to fully understand the qigong experience. One such study of experiences associated with Qigong exercise is in progress by the author. Another new line of enquiry not studied in the present thesis entails the duration of lingering effects of the affective improvements associated with Qigong exercise. According to the Maintenance Model of affective change that is associated with low-intensity exercise, improvements of affective responses are proposed to level out some time into the bout. Affective responses to Qigong exercise (Study III) increased continuously through the last assessment upon cessation of the bout. Kjos and Etnier (2006) found increased Positive affect (PANAS) at post-exercise, but mean average decreased to below premeasures already after 15 minutes of post-exercise rest. This opens up for new venues of research to study the lingering effects of Qigong – perhaps several hours post-exercise up to the whole day?

A randomized controlled study, in which beginners would learn the Qigong form and be randomized to a Qigong or control condition (e.g., silent reading) would provide for a greater understanding of causality as well as the ability to generalize. Given that Qigong is intended to be performed daily, a longer intervention study would also be of interest as it could show its chronic effects in relation to subjective well-being, for example.

Two issues worthy of further study relate to the moderating effects of positive expectations and depth of concentration, and their influence on acute affective outcomes. Theories (e.g. Lund, 1987), and empirical support (Geers et al., 2006; Jin, 1992; Jouper et al., 2006; O’Halloran et al., 2002) point in the direction of the probability of Qigong having placebo/expectation influences. Practical and personal empirical suggestions from the founder of Biyun Qigong (Fan, 2000), theoretical suggestions (Nakamura & Csikszentmihalyi, 2002, Smith, 1990), and empirical evidence (Jouper et al., 2006) suggest that the level of concentration or the ability to be absorbed by the focus of interest is important for the possibility of a beneficial affective outcome. Finally, it seems worthwhile to continue the methodology that was followed in Study III, including inter-individual assessments (in addition to
mean averages), as this may show the variation in experience between individual Qigong exercisers.
CONCLUSIONS

In the three studies of the present thesis, acute affective responses associated with Qigong have been studied. The thesis makes some important contributions to the further understanding of and support for Qigong-related affective health benefits. It can be concluded that the affective benefits of Qigong are partially superior to a control condition, independent of length of session, and that there are few associations between affective outcomes and expectations of positive mood outcomes. Affective responses have been studied through mean scores, individual responses and open-ended questions, in addition to different levels of the affective hierarchy. Qigong exercise is associated with a simultaneously activated and deactivated pleasant affective state, reduced anxiety, and positive mood states. However, there is some variation depending on the individual and how he/she chooses to measure affective responses (open-ended questions showed the majority of experiences related to Pleasant Deactivation). Positive affective responses begin to increase 10-20 minutes into the bout and continue to rise until cessation of exercise. A model for theories of possible active mechanisms associated with acute affective Qigong responses is presented. It can be concluded that Qigong is associated with more beneficial affective (acute) states for the sample studied. Other research, theories and suggestions also support an association with increased pleasant affect.
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