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## Utilizing Aromatherapy to Reduce Situational Anger in an Academic Setting

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ABSTRACT

**UTILIZING AROMATHERAPY TO REDUCE  
SITUATIONAL ANGER IN AN ACADEMIC SETTING**

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An Abstract Presented to the Faculty of the Graduate School  
of Lindenwood University in Partial Fulfillment of the  
Requirements for the Degree of  
Master of Art  
1997



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### ABSTRACT

This study examined the effectiveness of aromatherapy in promoting a positive affect, or emotion, by reducing situational or state anger in an academic setting. Seventeen graduate level counseling students in a Research Methods and Statistics class participated in the study one time per week over a period of four weeks. Subjects completed the state anger portion of the State-Trait Anger Expression Inventory (STAXI) during each of the four weeks. During two of the weeks, participants were exposed to the scent of rose oil; during the other two weeks no aroma was introduced into the classroom. While a decrease in the levels of state anger was observed during the two weeks with aroma, the decrease proved to be insignificant. The findings in this study suggest aromas may impact affect; however, further research is needed to confirm this hypothesis.

Approved for the Faculty of the Department of  
Counseling and Guidance  
University of Mississippi  
November 1997

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Karen R. Duncan, B.A.

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of Lindenwood University in Partial Fulfillment of the  
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Master of Art  
1997

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## DEDICATION

This thesis is dedicated to those people in my life who have provided me with the emotional support and unconditional love without which these last two and a half years would hardly seem possible. Thanks to my family, my friends, and most especially to my dog Roxie.

## ACKNOWLEDGEMENTS

I wish to acknowledge and thank my fellow students in the Research Methods and Statistics class for agreeing to participate in my research project. Also, many thanks to Dr. Jesse Harris for granting permission to use his classroom as a “mini-laboratory”. I wish to show my gratitude to Beth Ann Abbass, a licensed aromatherapist, who helped to guide my project in the early stages. And finally, to all of my peers who thought I was just joking about doing research at the mall.

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## CHAPTER I

### Introduction

With over sixty new perfumes introduced annually, as well as the already overflowing perfume and cosmetics' counters, the fragrance industry takes in billions of dollars each year (Damian & Damian, 1995). The increase in popularity of fragranced materials may be due, in large part, to the growing interest and increasing publicity of "aromatherapy" which claims to successfully treat ailments ranging from the physical to the psychological (Baron & Thomley, 1994). Statistics from 1992 revealed an estimated 20 billion dollars were spent on alternative health care in the United States, of which aromatherapy has played a part (Melwani, 1994). In addition, approximately 34 million Americans (one in three) have sought health care from non-medical practitioners (Melwani, 1994). Aromatherapy, though widely credited for treating psychological ills and physical complaints (Baron & Thomley, 1994; Damian & Damian, 1995; Fischer-Rizzi, 1990), still lacks sufficient support from scientific research (Baron & Thomley, 1994).

In addition to the public attention aromatherapy has received, large corporations have taken notice. By introducing specific fragrances (such as lemon, basil, or peppermint) into the heating or air conditioning systems of

large office buildings, business owners hoped to increase the alertness and energy levels of their employees (Baron & Thomley, 1994). For relaxation purposes, corporations may choose lavender, bergamot, or cedar in the ventilation systems of their office buildings (Baron & Thomley, 1994). The concept of fragrancing the office environment has been adopted by several corporations in Tokyo, as well as other cities.

Aromatherapy fits right in with the holistic health movement, by claiming to benefit the mind, the body, and the spirit (Damian & Damian, 1995; Harrison & Ruddle, 1995; Sanderson & Ruddle, 1992; Tattum, 1995; Tisserand, 1988). In fact, true aromatherapy utilizes pure essential oils, rather than synthetically developed fragrances typically found at cosmetics counters or in aerosol air fresheners (Damian & Damian, 1995; Fischer-Rizzi, 1990). Through the use of specific essential oils, applied either through massage, inhalation, ingestion, or other means, aromatherapy serves as an aid to induce relaxation, increase energy levels, and reduce anxiety. (Harrison & Ruddle, 1995; Sanderson & Ruddle, 1992; Tisserand, 1988).

In general, aromatherapists agreed that inhaling the scent of essential oils alters moods (Baron & Thomley, 1994; Sanderson & Ruddle, 1992; Tisserand, 1988). This makes perfect sense, according to Stoddart

(1988) and Dodd (1988), who explained that odors are processed in the part of the brain (limbic system) that also houses emotional responses.

Dodd (1988) suggested perfumes, or odors, may be regarded as a special class of mood modifying molecules. Finally, Tisserand (1988) reported that essential oils may be used to influence an individual's mood by evoking positive feelings or countering negative feelings.

#### Purpose of the Study

Although aromatherapists have made great claims about the benefits of aromatherapy, research into the use of aromas requires further validation to warrant the widespread use of aromas in altering moods (Baron & Thomley, 1994). The purpose of this study was to identify the positive impact aromatherapy may have to reduce situational or state anger. The research design sought to add scientific evidence to the field of aromatherapy and examine the validity of the claims made by aromatherapists regarding the mood altering benefits of essential oils. In the study, aromatherapy was used in an attempt to reduce the situational anger of counseling students in their graduate level statistics class. Information gathered from this study opens up questions about the possibilities for introducing aromatherapy as a supplementary or



complementary therapy which could be used in a counseling setting to enhance or alter moods.

### Hypotheses

Initially, analysis of the data examined the correlational relationship between trait anger and state anger. According to Spielberger (1996), a strong correlation exists between elevated levels of state anger and trait anger. The null hypothesis stated that variability in state anger is independent of trait anger. The alternative hypothesis suggested that variability in state anger is not independent of trait anger.

In determining the positive impact of aromatherapy in reducing situational or state anger, the null hypothesis suggests there are no significant mean differences between state anger with aroma and state anger without aroma. The alternative hypothesis contends there are significant mean differences between state anger with aroma and state anger without aroma.

### Operational Definitions

The following definitions will be used in this thesis:

**Aromatherapy:** The use of pure essential oils, either applied topically or inhaled to alter moods (Damian & Damian, 1995).

**Pure Essential Oils:** The fragrance of plants, derived from the essence of a plant, considered to protect plants from disease and parasites (Damian & Damian, 1995).

**Aromatherapists:** Persons trained or certified in the use of aromatherapy through education or training from credible aromatherapy institutes or courses.

**State Anger:** Emotional condition characterized by subjective feelings ranging from mild irritation to intense fury. Anger measured at a particular time. Also known as situational anger (Spielberger, 1996).

**Trait Anger:** Relative disposition to perceive a variety of situations as anger provoking. High levels of trait anger often result in elevated levels of state anger (Spielberger, 1996).

**Trait Anger-Temperament:** Overall inclination to experience and express anger without provocation (Spielberger, 1996).

**Trait Anger-Reaction:** Propensity to express anger when criticized or treated unfairly by others (Spielberger, 1996).

**Anger-in:** Anger that is held in, or suppressed (Spielberger, 1996).

**Anger-out:** Anger expressed outwardly toward other people or objects (Spielberger, 1996).

**Anger Control:** The attempt to control the expression of anger (Spielberger, 1996).

**Anger Expression:** General index of the frequency with which anger is expressed either inwardly or outwardly (Spielberger, 1996).



## CHAPTER II

### Review of Literature

#### The Effects of Angry Affect

Overall, how people feel influences their behavior and general health (Spielberger, 1996). According to Spielberger (1996), higher level feelings and expressions of anger interfered with optimal functioning. In fact, many researchers agreed that affect influences personal interactions (Baron, 1990; Carnevale & Isen, 1986). In general, individuals behaved more good-naturedly and cooperatively when they experienced a positive affect versus a negative or neutral affect (Baron, 1990; Carnevale & Isen, 1986). Snell, Gum, Shuck, Mosley, and Hite (1995) suggested that a correlation existed between social dysfunctions and the experiencing of clinical anger, a negative affect. These authors found feelings of clinical anger often corresponded with inappropriate and problematic interpersonal behaviors. Additionally, higher levels of anger, according to Spielberger (1996) corresponded with greater risk for hypertension, coronary artery disease, and heart attacks.

Snell et al. (1995) stated clinical anger also interfered with cognitive processes, such as decision making. Similarly, Baron (1990) found positive affect enhanced cognitive processes, such as retrieval and

encoding of information. Baron (1990) suggested that individuals often retrieved a more inclusive description of events when they also experienced a more positive affect. In addition, Isen, Daubman, and Kowicki (1987) found task performance involving the use of creative problem solving skills increased along with a positive affect.

Taken into the work place, research suggests positive affect lends itself to the idea that "mild shifts in affective states can exert appreciable effects on behavior in work settings" (Baron, 1990, p. 369). A link between positive affect and the reduction of aggression and anger combined with the enhancement of task performance, suggests that using this information in the work place may lead to the reduction of conflict and an increase in productivity (Baron, 1990). The implication here is that, by improving the overall affect in the workplace, profits may be enhanced.

However, how to enhance or elevate mood remains the question. Several researchers investigated various alternatives for enhancing mood, including exposure to pleasant films, receipt of a small gift, or favorable descriptions of other persons (Arkes, Herren, & Isen, 1988; Dobbins & Russell, 1986). In addition to these more concrete methods, some researchers considered the use of environmental factors to induce a more positive affect. Environmental conditions for promoting a positive affect

included certain types of music (May & Hamilton, 1980), pleasant environmental or climatic conditions (Bowman, Giuliani, & Minge, 1981), or exposure to pleasant aromas (Baron, 1983, 1986, 1990). Baron (1990) preferred the use of pleasant aromas for inducing a positive affect since aromas seemed the least intrusive of the methods studied.

Several authors agreed that aromas from essential oils achieved the results of an improved affect (Baron, 1990; Damian & Damian, 1995; Fischer-Rizzi, 1990; Tisserand, 1988). A well-known aromatherapist, Marguerite Maury, described the effects of aromatherapy on the psyche:

But of the greatest interest is the effect of fragrance on the psychic and mental state of the individual. Powers of perception become clearer and more acute and there is a feeling of having, to a certain extent, outstripped events. They are seen more objectively, and therefore in truer perspective. (Tisserand, 1988, p 175)

From a more scientific standpoint, many researchers agreed that moods could be influenced by aromas, since emotions are monitored by the limbic system - the part of the brain that also processes sensory perceptions (Dodd, 1988; Stoddart, 1988; Van Toller, 1988). Similarly, Lorig and Schwartz (1987) found a relationship existed between odor and the alteration of mood. Baron and Thomley (1994) agreed that exposure to



pleasant fragrances influenced mood positively, and suggested several previous studies had indicated these findings as well (Baron, 1981; 1983; 1986; Levine & McBurney, 1981).

#### Aromatherapy: Historical Perspective

Historically, the use of aromas dates back to ancient times (Damian & Damian, 1995; Harrison & Ruddle, 1995; Sanderson & Ruddle, 1992; Tisserand, 1988). In Egypt, the use of oils for both medical and spiritual purposes began around 5,000 years ago (Harrison & Ruddle, 1995; Sanderson & Ruddle, 1992; Tisserand, 1988). The Egyptians found aromatic plants beneficial for treating respiratory ailments, skin problems, intestinal distress; and for use in cosmetics and embalming (Harrison & Ruddle, 1995; Sanderson & Ruddle, 1992). During the same time period, essential oils established roots in China and India where oils were used in massage as a form of medical treatment (Damian & Damian, 1995).

In addition to medical benefits, the early civilizations in Egypt found spiritual uses for essential oils (Tisserand, 1988). According to Tisserand (1988), burning oils were thought to drive out evil spirits. This author suggested that those "evil spirits" would likely be viewed in modern times as symptoms of mental illness. Tisserand (1988) also suggested,

In the Old Testament the Lord instructs Moses in the creation of a 'holy perfume', based on frankincense, myrrh and other exotic gums. Whether in the form of aromatic oil or incense, such holy perfumes were presumably intended to evoke a spiritual atmosphere, or a heightened awareness in some sense. (p. 167)

Damian and Damian (1995) agreed that the earliest uses of essential oils for enhancing spiritual and religious practices dates back many centuries. These authors suggested that the first application of what they called "aromapsychology" dates back to early Mesopotamia. The Hebrews, the Babylonians, and the Sumerians used aroma in religious practices where the essential oils were thought to heighten consciousness and enhance meditation.

By the Middle Ages, knowledge of the spiritual, antibacterial, and medicinal properties of essential oils had increased (Harrison & Ruddle, 1995; Sanderson & Ruddle, 1992). Publication of recipes for infusing spices into the oils revealed a reliance on oils to improve the individual's ability to ward off the great diseases of the time (Harrison & Ruddle, 1995; Sanderson & Ruddle, 1992). From this period, historians reported that glove makers and perfumers, who used essential oils primarily to mask

body odors, rarely suffered the major illnesses attributed to the Middle Ages (Harrison & Ruddle, 1995; Sanderson & Ruddle, 1992).

By the 17th and 18th centuries, the use of essential oils for their healing properties had gained in popularity and great advances were made in France and Germany (Damian & Damian, 1995). Herbalists became well known in their day for researching the properties and values of the essential oils they employed (Damian & Damian, 1995). However, just as these discoveries were becoming known, chemists began developing drugs for treating medical ailments. Starting around 1650, physicians and herbalists (phytotherapists) began to disagree with one another. Phytotherapists believed the benefit of the herb came from the whole plant (Damian & Damian, 1995). Physicians and chemists attempted to isolate the beneficial parts of the plant to manufacture drugs. This marked a turn away from the naturopathic approach of using essential oils, to the increased use of synthetically made materials or medicines to treat disease (Damian & Damian, 1995; Harrison & Ruddle, 1995; Sanderson & Ruddle, 1992).

The focus on treating medical distress through the use of medicines, synthetic or otherwise, continued with great enthusiasm throughout the 19th century. However, several authors described the renewed interest in aromatherapy and the use of essential oils around the 1920s (Damian &



Damian, 1995; Harrison & Ruddle, 1995; Sanderson & Ruddle, 1992). At that time, a French cosmetic chemist burned his hand while working in the perfumery. He immersed his hand in a large vat of lavender oil. The burn healed within a few hours and left no scarring behind. The chemist, Rene'-Maurice Gattefosse', coined the term "aromatherapy", which was the title of his first book. The book sparked new interest in the use of essential oils (Damian & Damian, 1995; Fischer-Rizzi, 1990).

With renewed interest, research into essential oils began and later was expanded from use for the body to use for the mind (Harrison & Ruddle, 1995; Sanderson & Ruddle, 1992). However, Tisserand (1988) suggested that throughout history, aromatics had already been used as stimulants, sedatives, aphrodisiacs and anti-depressants. In modern times, aromas, both pleasant and unpleasant, have been studied in a variety of settings to examine their effectiveness in altering moods, reducing stress and anxiety (Baron & Thomley, 1994; Damian & Damian, 1995; Harrison & Ruddle, 1995; Sanderson & Ruddle 1992; Spector, Carey, Jorgensen, Meisler, & Carnrike, 1993;), improving task performance (Baron, 1990; Baron & Thomley, 1994), influencing the retrieval of memories (Baron & Thomley, 1994; Ehrlichman & Halpern, 1988; Schab, 1991), and even inducing behavior change through the use of olfactory aversion (Colson,

1972; Dixon, Helsel, Rojahn, Cipillone, & Lubetsky, 1989; Earls & Castonguay, 1989; Rojahn, McGonigle, Curcio, & Dixon, 1987).

#### Current Research Using Aromas

Numerous studies conducted on aromas examined the effects of pleasant and unpleasant aromas on activities such as task performance, feelings of physical well-being, experiencing of emotional states (Knasko, Gilbert, & Sabini, 1990), and memory retrieval (Ehrlichman & Halpern, 1988; Schab, 1990; Schab, 1991). Specifically, Knasko et al. (1990) attempted to uncover the effects a feigned ambient odor might have on participants' feelings of well-being, their emotional states, and their ability to perform various tasks after the suggestion of an ambient odor in the environment.

Although no odors were employed in this test, Knasko et al. (1990) anticipated that the suggestion of an unpleasant odor would negatively impact the participant's prediction of ability and subsequent results of a clerical coding test. The suggestion of a pleasant aroma was anticipated to improve the participants' predictions and overall performance on the test. After the clerical tasks, participants completed questionnaires on their emotional state, physical symptomology, and an overall rating of the



room's odor. In addition, a control group with a neutral aroma suggestion also completed the mentioned tasks and questionnaires.

Results of the Knasko et al. (1990) study revealed that participants who believed a pleasant aroma subsisted, rated the room odor as more pleasant than those with the unpleasant odor suggestion. This outcome tends to support the idea that the power of suggestion may influence the actual experience of the individuals. Additional results indicated that participants believing a pleasant odor to be present also experienced a more positive mood, although the suggestion of an unpleasant odor appeared to have no lowering effect on mood when compared to the neutral odor group. When compared with those participants in the control group and those in the pleasant odor-suggestion group, participants in the unpleasant odor-suggestion group tended to generate a higher number of physical symptoms, although they predicted and achieved higher scores on task performance. These results tend to indicate that researchers need to look beyond environmental conditions and more closely examine the interplay of the environment with the cognitions of the participants they are studying (Knasko et al., 1990).

In addition to the suggested power of an aroma on behavior, several researchers investigated the use of actual odors as a method of

behavior modification utilizing olfactory aversion therapy (Altman, Haavik, & Cook, 1978; Colson, 1972; Dixon et al., 1990; Earls & Castonguay, 1989; Laws, Meyer, & Holmen, 1978; Rojahn et al., 1987). Three studies examined the proficiency of olfactory aversion for curbing specific sexual behaviors (Colson, 1972; Earls & Castonguay, 1989; Laws et al., 1978).

With only one test subject, the Colson (1972) study used one of three types of noxious substances held beneath the nose of the patient at various times as he described his most recent homosexual encounter. This patient hoped to save his marriage by reducing his desire for homosexual relationships. By introducing the noxious substance at the appropriate time in the conditioning phase of the treatment, the subject began to associate those feelings of desire for another man with the noxious substance. He was later instructed to self-administer the odor by carrying the ammonium sulfide capsules with him when he went into areas where he had previously experienced homosexual desires. Overall, the treatment appeared successful, although the subject did return after several months to repeat the treatment.

Similar use of olfactory aversion therapy, utilized in two separate studies, provided positive results in reducing deviant sexual behavior (Earls & Castonguay, 1989; Laws et al., 1978). These studies, each based on a

single case, conditioned the subjects to reduce sexual arousal when exposed to stimuli which previously caused great arousal in the individuals. Laws et al. (1978) used valeric acid as the conditioning agent when the test subject became aroused after viewing slides of young children. These authors viewed treatment as successful in reducing the deviant sexual arousal for the subject. In general, Laws et al. (1978) viewed olfactory aversion as a simple technique, which these authors hoped would replace electrical shock aversion therapy. Similarly, Earls and Castonguay (1989) found aversion therapy with unpleasant odors very effective in reducing the pedophile tendencies of their test subject.

Several studies using unpleasant aromas as an aversive therapy have been conducted with children (Altman et al., 1978; Dixon et al., 1989; Rojahn et al., 1987). The aversive techniques, used on children with disruptive or self-injurious behavior patterns, achieved varied degrees of success. In the Altman et al. (1978) study, the aversive therapy resulted in some reduction of hair pulling, or trichotillomania, in a four year old girl. Researchers reported that the use of aromatic ammonia held near the child's nose for a period of three seconds each time the child attempted to pull her hair, failed to fully suppress the self-injurious behavior. However, use of aromatic ammonia to reduce inappropriate behaviors was thought to



be a simple procedure which could be utilized at home by the parents of the child. Results did reveal a decrease in the target behavior (Altman et al., 1978).

In contrast, Rojahn et al. (1987) found aversive therapy using aromatic ammonia ineffective in suppressing symptoms of pica in a 16 year old test subject. Pica, an axis I diagnosis usually first diagnosed in childhood, is characterized by the eating of nonnutritive substances for at least one month (American Psychiatric Association Diagnostic and Statistical Manual, 1994). For this study, spraying water mist into the child's face produced greater results than the use of the ammonia to induce the same behavior change. The results of these studies left many unanswered questions as to the effectiveness of aversion therapy with unpleasant odors in generating behavioral changes. Damian and Damian (1995) suggested that

positive reinforcement using pleasurable scents is usually more productive, in the long term at least, if not more immediately effective than negative aversion therapy techniques using harsh odors such as ammonia. This is because pleasant odors are not rejected, physically or emotionally, hence they penetrate deeper into the psyche and memory. (p. 151)

Studies conducted by Baron (1983), DeBono (1992), and Hirsch (1995) supported the use of pleasant aromas to influence behavior. Specifically, Hirsch (1995) investigated the effects of a pleasant ambient aroma on the slot machine usage at a Las Vegas casino. Results indicated that in one area of odorization, slot machine usage went up, however, this did not hold true for the other area of odorization during the same weekend. Researchers believed the increase may have resulted from olfactory evoked recall.

DeBono (1992) hoped to understand more about the cognitive processes involved in persuasion using aromatic substances. This study utilized perfume advertisements, attractive and unattractive salespersons, strong and weak arguments for the perfume, and samples of the perfume given prior to the viewing of the advertisements and sales pitches. Results indicated that participants exposed to the perfume prior to the advertisements and salespeople, were more persuaded by the attractiveness of the salesperson, rather than the stronger arguments for the perfume. According to DeBono (1992), those exposed to the perfume processed the persuasive information peripherally or through heuristic cues. This cognitive processing was found to be very similar to the manner in which

persons in a positive mood have been found to process information (Baron, 1983, 1990; DeBono, 1992; Isen, 1984).

When investigating the effects of artificial scents on evaluations of job applicants, Baron (1983) hypothesized that the aroma may induce a more positive mood in the interviewer. However, results of this study revealed that male interviewers rated lower those individuals with perfume or cologne, while females generally gave a higher rating to those applicants with perfume or cologne. Baron (1983) suggested that these results indicate males have more difficulty ignoring extraneous aspects of job applicants than females. Overall, while pleasant scents have been shown to elevate moods, they do not necessarily enhance the interviewer's liking of the applicant (Baron, 1983).

While these studies looked at pleasant aromas, Ehrlichman and Halpern (1988) examined the effects of both unpleasant and pleasant odors on memory retrieval. These authors reported a link between a positive mood and the recall of happy memories, as well as a link between a negative mood and the recall of unhappy memories. In addition, the sense of smell has been related to emotions, while the visual and auditory sensations have a more cognitive connection (Engen, 1982). The results of the Ehrlichman and Halpern (1988) study indicated that those participants



exposed to the pleasant odor recalled a significantly higher number of memories when presented with a list of 21 mood-neutral words.

Schab (1990) also conducted a memory study utilizing odors. This author investigated the use of odors as memory cues. Participants were asked to learn and then recall a list of words. Results indicated that when the odor was present during both the learning and the recall portions of the experiment, participants demonstrated greater recall than those in the no-odor group. Participants in a third group received exposure to the odor in either the learning or the recall phase of the experiment. These participants had scores similar to those participants in the no-odor group.

Aside from aroma research into aversive therapy, influence on memory, and impact on task performance, aromatherapy has also been utilized to reduce speech anxiety (Spector et al., 1993). In their study, these authors hoped to pair aromas with relaxation training, implementing both as conditioned cues for reducing speech anxiety. Furthermore, the study hoped to uncover aromas' abilities to decrease arousal for individuals with clinical disorders. Findings revealed that when coupled with relaxation training, aromas proved effective in reducing speech anxiety. However, the aromas alone were unable to support a reduction in anxiety for the

participants in the study. These authors believed claims made by aromatherapists were premature and recommended further research.

In the United States, aromatherapy has failed to take off as a serious therapy, while Great Britain has already experienced a trend toward using aromatherapy to promote health and well-being (Harrison & Ruddle, 1995; Sanderson & Ruddle, 1992). With the holistic trend toward treating not only the body, but the mind and spirit, many health service agencies in Great Britain have already incorporated aromatherapy. For example, occupational therapists have used aromatherapy, combined with massage, to aid in relaxation, invigoration, and sensory stimulation for their patients, according to Sanderson and Ruddle (1992).

Additionally, aromatherapy has been used with adults and children who have severe learning disabilities (Harrison & Ruddle, 1995). These authors explained that aromatherapy promotes sensory stimulation and helps to build a trusting relationship between therapist and client. For clients with limited communication skills, the sense of smell offers another avenue for communication. These authors agreed that aromatherapy, combined with massage, can serve to relax or invigorate clients. Overall, Harrison and Ruddle (1995) suggested that aromatherapy could enhance an individual's quality of life.



### Methods for Applying Essential Oils

Essential oils, found to have antimicrobial, antibacterial, anti-depressant, and sedative properties, benefit individuals through many approaches (Damian & Damian, 1995; Fischer-Rizzi, 1990; Harrison & Ruddle, 1995; Sanderson & Ruddle, 1992). Essential oils can be inhaled, absorbed into the skin, or ingested. Some common ways of using essential oils include adding them to an aroma lamp, a vaporizer, a compress, bath water, or a carrier oil or lotion, as well as ingesting the oil under the supervision of an experienced aromatherapist (Fischer-Rizzi, 1990). Bookstores and health food stores often carry several books describing the use and various purposes of essential oils. Baron and Thomley (1994) reported that the fragrancng industry sells billions of dollars of fragranced products annually.

Researchers suggested one of the most common and beneficial methods for utilizing essential oils was through massage. Many authors stressed the importance of touch combined with the oils (Harrison & Ruddle, 1995; Sanderson & Ruddle, 1992). These authors suggested humans suffer without touch, as had been shown by many previous research studies. For example, many authors cited research which demonstrated that touching in early life led to children who were generally

happier and healthier (Harrison & Ruddle, 1995; Sanderson & Ruddle, 1992; Tisserand, 1988). In addition to the benefits of touch, massage using essential oils allows the oil not only to be absorbed into the body through the skin, but also inhaled (Tisserand, 1988). This provides multiple benefits for the individual (Harrison & Ruddle, 1995; Sanderson & Ruddle, 1992; Tisserand, 1988).

For massaging, the essential oil which is diluted in a carrier oil or lotion is then applied to the skin. The carrier oil typically consists of an unscented vegetable oil such as almond or grape seed oil (Tisserand, 1988). Fischer-Rizzi (1990) suggested jojoba, hazelnut, wheat germ, coconut, olive, and aloe vera oils achieve the same effects when used as carrier oils for the essences. Damian and Damian (1995) suggested the best lotion to use comes from a vegetable based source.

Tisserand (1988) suggested that absorption of the oil by the skin and the subsequent inhalation of the scent of the oil during the massage causes physiological and emotional responses within the body. Similarly, Harrison and Ruddle (1995), who used aromatherapy for individuals with severe learning disabilities, suggested five purposes for using aromatherapy with massage. These included "to invigorate and promote activity and alertness, to facilitate relaxation and reduce stress, to stimulate sensory

awareness, to facilitate and encourage interaction and communication, and to treat medical problems using natural substances” (p. 38).

The use of an aroma lamp to introduce the aroma of essential oils into the room is another method of using aromatherapy (Damian & Damian, 1995; Fischer-Rizzi, 1990; Harrison & Ruddle, 1995). An aroma lamp consists of a small container for water and typically is heated by a candle placed below the container. Essential oils are diluted in the water and disseminated into the room through the vapor from the heated water (Fischer-Rizzi, 1990). With this method, the aromas of the essential oils would be inhaled by the individual. Other ways to breathe in the aromas include carrying a small vial of the oils, fragancing a sachet or handkerchief, or adding the oil to bathwater.

#### The Use of Aromatherapy to Enhance Affect

Tisserand (1988) discussed a connection between odors and basic human drives such as sex, food, and a heightened awareness of dangerous circumstances. This author further suggested physiological changes take place inside the body when odors are present. These changes may include a fluctuation in blood pressure, muscular tension, skin temperature, as well as shifts in the patterns of brain waves. The physiological alterations indicate an emotional response to the odors present, according to Tisserand



(1988). Rovesti (in Tisserand, 1988), when describing responses of psychiatric patients to aromatherapy stated,

It may be said that the patients feel as if transported by the perfume or by the essential oil into a different, more agreeable and acceptable world, so that many of their reactive instincts are curbed and they gradually return towards normality. (p. 175)

In a work setting, Baron's (1990) study targeted environmentally induced positive affect utilizing pleasant fragrances to enhance mood. This research revealed that positive affect in the work place improved levels of confidence and enhanced the creative approaches adopted by the participants in the study. Furthermore, participants with positive affect set higher goals and expected more positive outcomes when attempting negotiations. This study supported the research by Carnevale and Isen (1986) which suggested positive affect influenced bargaining sessions, in that participants reported higher levels of satisfaction with the outcome of negotiations. Baron's (1990) study indicated that positive affect could also be influenced by pleasant fragrances, whereas Carnevale and Isen (1986) employed other methods for enhancing affect. A similar study in Japan revealed errors made by computer operators were reduced by 54% when the workers were exposed to a lemon fragrance (Birchall, 1990).

Today, trends toward a holistic approach of treating the body, the mind, and the spirit open up questions about how to encompass all three. Holistic counseling has been a part of the holistic health movement, which includes professionals from the medical community, as well as mental health professionals (Peterson & Nisenholz, 1991). Sanderson and Ruddle (1992) suggested, "Aromatherapy is a holistic therapy, considering the person in terms of mind, body, and spirit" (p. 311). In the past, research has shown a direct link between affective states (i.e. anger) and physical health (Spielberger, 1996). According to Spielberger (1996), research has shown high levels of anger and hostility negatively impact a person's health and have been linked with coronary artery disease, hypertension, and cancer, among other things. This study examined aromatherapy as a method for helping to reduce state anger in an academic setting.



## CHAPTER III

### Method

#### Participants

For this research study, 21 graduate level students in a Professional Counseling program at Lindenwood College in St. Charles, Missouri, voluntarily agreed to participate. All participants were members of a Research Methods and Statistics class designed to prepare students for understanding and utilizing statistics needed for writing their master's thesis. Previous students taking this course had commented to the director of the counseling program that the workload and the difficult content of the course had resulted in a generally angry atmosphere in the classroom.

Four students were unable to participate in the study due to their absence from class on at least one night of testing. The final sample size,  $n = 17$ , consisted of one male and 16 females ranging in age from 25 to 50 years old. One female student was an African-American; the remaining 16 students were Caucasian.

#### Materials

Pure rose oil, known for inducing a sense of euphoria (Damian & Damian, 1995) was selected for this study. Two aroma lamps, containing 6-9 drops of rose oil diluted in water, were placed in the room. Candles lit

beneath each lamp heated the rose oil and water, disseminating the scent of the rose oil into the room.

The testing instrument, Spielberger's (1996) State-Trait Anger Expression Inventory (STAXI), Form HS, measured participants' levels of state anger, trait anger (temperament and reaction), and anger expression (inward, outward, control, and overall expression). The STAXI consists of 44 items divided into three parts. Part one, a ten item scale, measures the intensity level of state anger or anger at the time the test is taken. Part two, a ten item scale, measures trait anger including two subscales measuring angry temperament (experience of anger without provocation) and angry reactions (becoming angry when criticized or treated unfairly). Part three contains 24 items consisting of three 8-item scales and an overall subscale of anger expression. The scales measure the frequency of anger being suppressed, the recurrence of the outward expression of anger towards other people or objects, and the frequency of an individual controlling angry expressions.

Each item in the instrument calls for a rating of 1-4 on a four-point scale. Higher scores suggested higher levels of state anger, trait anger, including angry reactions and angry temperaments, and anger expression, including anger suppression, outward anger expression, and anger control.

According to Spielberger (1996), scores ranging from the 25th to 75th percentile fell within the normal range. Table 1 displays the approximate normal ranges for the 8 scales within the STAXI, normed on both adult males and adult females.

Table 1

**Approximate Raw Scores Falling within Normal Range  
Normed on Adult Males and Adult Females**

	<b>Adult Males</b>	<b>Adult Females</b>
<b>State Anger</b>	10-11	10-14
<b>Trait Anger</b>	15-21	15-22
<b>Angry Temperament</b>	4-8	4-7
<b>Angry Reaction</b>	7-11	7-11
<b>Inward Anger</b>	12-17	12-18
<b>Outward Anger</b>	11-16	11-17
<b>Controlled Anger</b>	23-29	18-25
<b>Anger Expression</b>	13-23	16-29



### Procedure

The STAXI, Form HS, was administered during four consecutive class sessions. Class sessions lasted 5 hours and were held one evening per week. The tests were administered during the middle of the class, approximately 1.5 to 2.0 hours after class began. Participants were informed that the researcher was gathering data on situational anger in an academic setting. No mention was made about the use of aromatherapy to reduce anger. Table 2 highlights the parts of the STAXI used and under what conditions. Parts one, two, and three of the STAXI, Form HS, were administered to the participants during the first week of the study. The students were asked to read the instructions for each section and to work at their own pace. Before beginning the test, participants were reminded to answer questions from section one according to how they currently felt, section two dealt with how they generally feel, and section three required answers related to how participants feel when angry or furious. The three subscales were only administered on the first night of the testing. No aroma was introduced during the initial testing phase.

During week two, participants completed section one (state anger) of the STAXI, Form HS, to measure how they currently felt. During this week, pure essential rose oil was diluted in water and heated in two aroma



lamps to disseminate the aroma throughout the room for approximately one hour to one hour and 15 minutes before the test was administered. Class was conducted as normal during the interim.

Table 2

<b>Overview of Testing Conditions</b>
---------------------------------------

	Sections of STAXI From HS	Aroma	No Aroma	Water only
Week 1	State Anger, Trait anger, and Anger Expression		X	
Week 2	State Anger	X		
Week 3	State Anger			X
Week 4	State Anger	X		

On the third evening of testing, participants were again asked to complete section one of the STAXI, Form HS, after being reminded to answer for how they were currently feeling. The aroma lamps were again placed in the room, however, only water was being heated, as the rose oil

was not added on this evening. Again, the test was administered approximately 90 minutes after class began.

During the fourth week of the testing, participants again completed section one of the STAXI, Form HS. They were reminded to answer based on how they currently felt. The pure essential rose oil was again present in the room, through the use of the two aroma lamps.

A note should be made that on the first and the third nights of testing, the course instructor administered quizzes to the class members. The content of the quizzes related to the course content. These quizzes were returned to the students on the second and fourth nights of the testing procedure.

#### Data Analysis

Data analysis for this study consisted of a correlational investigation and a t-test. The correlational analysis examined the relationship between state anger in general and trait anger. Spielberger (1996) suggested high levels of trait anger corresponded with elevated levels of state anger. The t-test looked at the mean differences between the state anger scores with aroma and the state anger scores without aroma. For both tests, data was analyzed utilizing SPSS /PC + (Norusis, 1991).

## CHAPTER IV

### Results

During the first night of testing, participants completed the entire STAXI, Form HS, including all subscales. Data from part one (state anger) was collected for each of the four nights of testing. Data from parts two and three (gathered only on the first night of testing) were used to describe the sample in terms of overall trait anger and anger expression. Categories tested included overall trait anger, tendency to have angry reactions, a general angry temperament, expression of anger held in, let out, or controlled, and an overall anger expression score. The purpose of gathering this data was to examine the general tendencies of the participants to become angry or have elevated state anger levels due to higher levels of trait anger.

#### Overall Trait Anger Levels of Participants

Raw data from STAXI parts two and three, converted to normalized T-scores, revealed that on average, participants fell within the normal range for anger levels on all subscales. Table 3 displays the mean, or average, normalized T-scores for each of these subscales. Standard

deviations, the range, and skewness levels, based on t-scores, are also reflected in Table 3. The scores were normed on adults.

Table 3

<b>Range, Means, Standard Deviations, and Skewness Levels of Sample from STAXI, Form HS, Parts Two and Three</b>				
	<b>Range</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Skewness</b>
<b><u>Trait Anger</u></b>	28.000	48.588	7.332	-.577
<b><u>Trait Anger: Temperament</u></b>	20.000	51.529	5.907	.388
<b><u>Trait Anger: Reaction</u></b>	30.000	49.647	8.077	-.485
<b><u>Anger Held In</u></b>	36.000	52.588	10.880	.144
<b><u>Anger Expressed Outwardly</u></b>	28.000	52.176	8.516	-.393
<b><u>Anger Controlled</u></b>	25.000	56.000	7.898	.212
<b><u>Anger Expression</u></b>	29.000	48.235	7.886	-.254

From the data in the table, participants in this study (n=17) appeared to experience less trait anger, lower frequency of angry reactions,



and expressed their anger (inwardly and outwardly) less often than would be expected had this sample come from a normally distributed population. As t-scores were used, a mean score of 50 would be expected in each of these categories for a normally distributed population. The results suggested that distributions of scores for these categories were negatively skewed. This supports the idea that the participants had slightly lower scores in the trait anger, trait anger-reaction, and anger expression categories of the testing instrument.

The mean scores also suggested that participants had a slightly higher degree of an angry temperament (experiencing anger without provocation), more often held in their anger, and more often expressed anger outwardly than would be expected. In addition, the participants' mean t-scores for anger control suggested attempts to control their anger at higher levels than would likely be found in a normally distributed group. Based on the skewness levels, the distribution of scores for the trait anger temperament, anger held in, and anger controlled scales was positively skewed.

Based on the range of scores and standard deviations observed, participants varied the most in the amount of anger they held in, or suppressed. The range of 36.000 corresponds to actual t-scores of 36 to

72, with a standard deviation from the mean of 10.880. The smallest amount of variability, observed in the trait anger: temperament category, with a range of 20.000 and standard deviation from the mean of 5.907, corresponded to t-scores of 44 to 64.

#### Correlational Data Between Trait Anger and State Anger

Spielberger (1996) reported high levels of trait anger corresponded with elevated levels of state anger. SPSS PC+ was utilized to find out if the trait anger scores correlated with the state anger scores obtained for the participants in this study. An alpha level of .05 was selected to test the null hypothesis that variability in state anger is independent of trait anger, including the subscales reported in the STAXI, Form HS. Table 4 shows the correlational data gathered from this study. When  $P > .05$ , the null hypothesis is accepted.

During Week 1, the null hypothesis that state anger is independent of trait anger was accepted for the subscales of trait anger, trait anger-temperament, anger held in, anger expressed outwardly, anger controlled, and anger expression. The null hypothesis was rejected for the trait anger-reaction subscale. In that case, state anger was not independent of trait anger, as  $P < .05$ . A correlational coefficient of  $r = .5482$  found for trait anger-reaction, indicated that  $r^2 = .3005$ , or 30.05 % of the variability in

state anger for week one accounted for the variability in trait anger-reaction.

During Week 2, the null hypothesis was accepted that state anger is independent of trait anger and the various subscales. During this week, no relationship was found between any of the subscale scores for trait anger and state anger. Week 3 suggested the null hypothesis was accepted for the subscales of trait anger-temperament, anger held in, anger expressed outwardly, anger controlled, and anger expression. However, a relationship was found between state anger in week three and trait anger and trait anger: reaction. For trait anger, the correlation coefficient  $r = .5546$  suggested that  $r^2 = .3076$ , or 30.76% of the variability in trait anger accounts for the variability in state anger. The trait anger-reaction correlation coefficient of  $r = .6184$ , suggested that  $r^2 = .3824$ , or 38.24 % of the variability in trait anger-reaction accounted for the variability in state anger during Week 3.

During Week 4, the data suggested no relationship existed between state anger and trait anger-reaction, anger held in, anger expressed outwardly, anger controlled, and anger expression. A relationship existed between trait anger, trait anger-temperament, and state anger during week 4. For trait anger, a correlation coefficient of  $r = .5492$  and  $r^2 = .3016$ ,





Table 4

<b>Correlational Data: State anger and Trait Anger</b>				
	<b>State Anger</b>			
	<b>Week 1</b>	<b>Week 2</b>	<b>Week 3</b>	<b>Week 4</b>
<b>Trait Anger</b>	.4042 P = .108	.4316 P = .084	.5546 P = .021	.5492 P = .022
<b>Trait: Temperament</b>	.0933 P = .722	.4035 P = .108	.0813 P = .757	.6041 P = .010
<b>Trait: Reaction</b>	.5482 P = .023	.2991 P = .244	.6184 P = .008	.2879 P = .262
<b>Anger Held In</b>	.0297 P = .910	-.0409 P = .876	.1837 P = .480	-.1414 P = .588
<b>Anger Expressed Outwardly</b>	-.0022 P = .993	.1871 P = .472	-.0419 P = .873	.3862 P = .126
<b>Anger Controlled</b>	-.2860 P = .266	-.4754 P = .054	-.3038 P = .236	-.3580 P = .158
<b>Anger Expression</b>	.2230 P = .390	.3597 P = .156	.3269 P = .200	.2551 P = .323

### Impact of Aroma on State Anger

To test the impact of aromatherapy on state anger, the raw scores from week one were combined with the raw scores from week three. Aroma had not been introduced into the testing environment during either of these weeks of testing. These test scores ( $n = 34$ ) were labeled the "nonaroma" group. State anger raw scores from weeks two and four were combined as well. These test scores, ( $n = 34$ ) were labeled the "aroma" group. A t-test for paired samples was run on the mean scores of these groups. To obtain the data, SPSS / PC+ was utilized (Norusis, 1991). Table 5 displays the results obtained from the t-tests.

The null hypothesis being states there is no significant mean difference between state anger with aroma and state anger without aroma. The alternative hypothesis suggests there is a significant mean difference between state anger with aroma and state anger without aroma. For this t-test, a significance level was set at .05.

Table 5

<b>State Anger T-tests for Paired Samples:</b>
<b>Aroma and Non aroma</b>

Variable	Number of pairs	Corr	2-tail Sig	Mean	SD	SE of Mean
Aroma	34	.325	.061	12.6765	3.591	.616
Non- aroma				14.2647	4.699	.806

Paired Differences

Mean	SD	SE of Mean	t-value	df	2-tail Sig
-1.5882	4.900	.840	-1.89	33	.068
95% CI (-3.298, .122)					

The mean state anger score for the aroma group was 12.6765, with a standard deviation of 3.591. The standard error of the mean was .616. The nonaroma group produced a mean score of 14.2647, a standard deviation of 4.699, and a standard error of the mean of .806. On average, the aroma group scored 1.5882 points lower on state anger than the nonaroma group. The standard deviation of the differences between the two groups was 4.900, while the standard error of the mean differences was .840.

The observed significance found for this t-test of the paired sample was .068. A t-value of -1.89 was obtained, using 33 degrees of freedom. As the t-value falls within the 95% confidence values of -3.298 and .122, and the significance level of .068 was greater than the alpha (.05), the null hypothesis would not be rejected. Thus, no significant mean difference was found between state anger with aroma and state anger without aroma.



## CHAPTER V

### Discussion

Previous research showed that aromatherapy improved overall affect enhanced task performance (Isen et al., 1987), fostered greater benevolence (Baron, 1990; Carnevale & Isen, 1986), and reduced anger or conflict in the work place (Baron, 1990). Furthermore, aromatherapy reduced the experience of a negative affect, such as clinical anger, lowered risks for hypertension, coronary artery disease, and heart attacks (Spielberger, 1996). A reduction in clinical anger also enhanced cognitive processes, including the improvement of memory and retrieval, according to Snell and colleagues (1995).

Research revealed several effective methods for promoting a more positive affect included the introduction of certain types of music (May & Hamilton, 1980), exposure to pleasant films, receipt of a small gift (Arkes et al., 1988; Dobbins & Russell, 1986), or pleasant environmental conditions (Bowman et al., 1981). However, Baron (1990) suggested aromas introduced into the environment could be used as a less intrusive method of promoting a positive affect. Furthermore, Damian and Damian (1995) recommended the use of essential oils for introducing aromas into the environment in order to effect a more positive affect.

Tisserand (1988) reminded readers that over the last 5,000 years various essential oils have demonstrated their anti-depressant, euphoric, sedative, stimulant, or aphrodisiac qualities. However, as medical practice moved towards the use of synthetically manufactured drugs to treat illness, naturopathic remedies, such as essential oils, were left behind (Harrison & Ruddle, 1995; Sanderson & Ruddle, 1992; Tisserand, 1988). More recently, attention paid to holistic health has focused on treating the mind and spirit, as well as the body. Along with this has been renewed interest in the use of naturopathic remedies (Harrison & Ruddle, 1995; Sanderson & Ruddle, 1992). However, a limited number of studies have examined the use of aromas as a complementary therapy in the field of counseling (Spector et al., 1993).

The current study sought to determine the effectiveness of using essential oils for promoting a more positive affect by reducing situational or state anger in an academic setting. The test subjects for this study consisted of 17 graduate level counseling students. Test results revealed that the participants experienced less than average levels of trait anger. According to Spielberger (1996), those individuals with higher levels of trait anger correspondingly have elevated levels of state or situational anger. On average, the participants also had a tendency to experience more anger

without provocation and also attempted to suppress this anger more than would be expected from a normally distributed population.

Results from this study indicated that the overall levels of state anger decreased during the two weeks with aroma versus the two weeks without aroma. However, upon closer examination, the decrease in the levels of state anger did not suggest a significant increase. Thus, the use of essential oils introduced into the classroom environment did not result in a decrease in the levels of state anger experienced by the graduate counseling students.

#### Limitations of this Study

This study had several limitations which likely impacted the outcome. First of all, the short term nature of the study limited the ability of the STAXI to establish that the Research Methods and Statistics class promoted a negative affect among the class members. Verbal reports to the director of the counseling program suggested a negative affect in the classroom, but this had not been established by previous research. In addition, the sample consisted of only 17 participants which limited the ability of this study to generalize from the sample to the general population about the effectiveness of aromas in influencing affect.

Several factors were not in the control of the researcher regarding the testing of the state anger. On the first and the third nights of the administration of the state anger inventory, the class participants also completed a test over the research methods and statistics class materials. The effect on the overall affect of the participants likely was impacted by these events. In addition, the researcher had no control over the affect of each of the participants on any of the nights of testing. Thus, the participants may have been experiencing more or less anger on any of the nights of testing, with or without aroma. Providing a pre-test (before aroma) and a post-test (after aroma) could have eliminated this confounding variable.

As the testing instrument was administered in an uncontrolled setting, many factors could have contributed to a change in the affect of the participants, such as class room discussion, temperature in the room, or events in the lives of the participants. Many of these confounding factors could have been eliminated by a larger sample size with an already documented level of angry affect.

Concerning the testing instrument itself, some limitations were also revealed during the testing. Overall, the sample selected demonstrated lower than would be expected levels of state anger than had this come from



a normally distributed population. In addition, Spielberger (1996) suggested the STAXI was less effective in differentiating between lower levels of state anger and was a better measure of higher levels of state anger.

#### Suggestions for Future Research

Future studies could examine a larger sample of individuals with an established level of clinical anger. This study may be conducted within the confines of a therapy group aimed at reducing anger and aggression. For example, a group whose primary purpose has been established as conflict resolution or anger management would likely be a better testing sample for anger reduction using aromatherapy. Pre-tests could be given on each night of testing to determine anger levels prior to the exposure to the aromas.

A larger sample size would likely also provide a more thorough understanding of the ability of aromatherapy to alter mood. The results of this study were in large part inconclusive due to the limited number of test subjects. A larger sample size would provide more evidence either opposed to or in support of the use of aromas to induce an affective change. In addition, a study done over a longer period of time would likely produce more useful information about aromatherapy.

The current study utilized rose oil which was introduced into the room through an aroma lamp. Future studies may try to either apply the oils topically or provide individual doses of the aromas to the test participants. This could be achieved by placing a few drops of the essential oil onto a handkerchief and having the individuals hold the scented cloth near their noses.

Further studies may examine the effectiveness of various oils to reduce stress (perhaps in a stress reduction workshop) or reduce anxiety (such as in an anxiety relief group). Individuals may utilize essential oils outside of therapy and could be taught how to use the oils on their own or in areas that promote stress or anxiety for the individual.



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