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Treatment of Specific Animal Phobias and the Relationship of an Opiate Antagonist to Outcome

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TREATMENT OF SPECIFIC ANIMAL PHOBIAS
AND THE RELATIONSHIP OF AN OPIATE
ANTAGONIST TO OUTCOME

by

Andrea T. Kozak, Ph.D.

A Dissertation
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Doctor of Philosophy
Department of Psychology

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CHAPTER I

INTRODUCTION

According to the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV; American Psychiatric Association, 1994), approximately 10% of the general population will be diagnosed with specific phobia sometime in their lifetime. The *DSM-IV* (American Psychiatric Association, 1994) categorizes specific phobia as an anxiety disorder along with such disorders as obsessive-compulsive disorder (OCD), panic disorder, social phobia and posttraumatic stress disorder. With the exception of social phobia, specific phobia is the most common anxiety disorder, indicating that many individuals experience intense anxiety when exposed to heights, injections, small closed places, or spiders and/or spend a significant amount of time avoiding the stimulus they fear. Two main types of treatment for anxiety disorders exist currently: psychotrophic medication and psychological therapy. Although multiple controlled studies demonstrating the effectiveness of pharmacological treatment for anxiety disorders such as OCD have been published in the literature, very few studies have been conducted with specific phobics (Benjamin, Ben-Zion, Karbofsky, & Dannon, 2000). Benjamin et al. (2000) conducted a small double-blind study utilizing paroxetine and a placebo. It was determined that paroxetine was more effective than placebo as measured by the Hamilton Rating Scale for Anxiety (HAM-A, Hamilton, 1959) and Fear Questionnaire (Marks...
& Matthews, 1979). The sample size in the Benjamin et al. (2000) study was small with only ten participants, and it appears that many more pharmacological studies are necessary before medication is considered to be an acceptable treatment for specific phobia. Eye Movement Desensitization and Reprocessing (EMDR) has been effective in treating some cases of specific phobia, but when controlled studies have been conducted comparing it to in vivo exposure, which is a form of behavior therapy (Muris & Merckelbach, 1997; Muris, Merckelbach, van Haaften, & Mayer, 1997), the evidence seems to favor in vivo exposure (as cited in Muris & Merckelbach, 1998).

According to Kaplan, Sadock, and Grebb (1994), behavior therapy is the only recognized treatment for specific phobia (as cited in Benjamin et al., 2000). Exposure therapy has been very effective in treating specific phobia in controlled studies (Booth & Rachman, 1992; Menzies & Clarke, 1993; Öst, Johansson, & Jerremalm, 1982). Marks (1987) has suggested that the specific variant called in vivo exposure is the treatment of choice for specific phobia. For example, Öst (1989) successfully treated 20 individuals who had specific phobia utilizing graduated exposure and modeling. According to Öst (1989), "...90% of the patients obtained a clinically significant improvement which was maintained at the follow-up after an average of four years" (p. 6). In another study, Öst, Salkovskis, and Hellstrom (1991) compared therapist-directed exposure and modeling with self-directed exposure via a written manual in the treatment of 34 participants with specific phobia. The results indicated that the
therapist-directed exposure and modeling was more effective than the manual; 71% of the former individuals had a clinically significant change while only 6% did in the latter group.

In addition, Koch, Luterek, and Spates (1998) tested a one-session exposure treatment protocol modified from Öst’s work and compared it to a no-treatment control group and a non-phobic control group. The one-session exposure group had significantly better scores on the behavioral and self-report measures in comparison to the no-treatment control group. In a second study, Koch, Spates, and Kozak (2001) compared one-session exposure treatment to one-session exposure treatment plus cognitive components. Both treatments were equally effective as measured by behavioral and self-report measures. As a result of treatment, most individuals in both studies were able to approach and/or hold the animal they feared while reporting either no anxiety or significantly less anxiety (when compared to baseline).

Many behavior therapists agree that response extinction is the mechanism of action underlying the effectiveness of exposure treatment such as one-session exposure, but disagree as to how the process occurs (Egan, Carr, Hunt, & Adamson, 1988). Wolpe (1958) hypothesized that increased inhibition through techniques that counter-condition the feared response is responsible for the effect (as cited in Merluzzi, Taylor, Boltwood, & Gortestam, 1991). Others have hypothesized that competing responses such as coping skills (Goldfried & Trier, 1974; Suinn & Richardson, 1971), changes in cognition (Bandura, 1977; Meichenbaum, 1977), or changes in expectancy (Kazdin & Wilcoxin, 1976) cause extinction (as cited in Merluzzi et al., 1991). Recently, some have hypothesized that endogenous opioids are involved.
in extinction of the fear response (Amtz, Merchelbach, & de Jong, 1993). In other words, this potential physiological explanation is supplemental rather than a replacement for the behavioral process of extinction. If true, better understanding the physiological processes in this context could be valuable in order to allow an already effective treatment to become even more efficient.

In the process of developing implosion therapy, which is one type of treatment that uses exposure, Stampfl and Levis (1967) extrapolated from laboratory evidence that the elimination of anxiety is based on extinguishing control exerted by the feared stimuli that occasion the avoidance behavior. One theory upon which they drew extensively was the two-factor theory of avoidance, which was developed initially by Mowrer (1947) to explain the relationship between avoidance behavior and fear (Levis, 1979). While Mowrer's theory provided an explanation of the acquisition of learned fear based on respondent and operant conditioning, in the present context, its relevance is to the extinction of that same response. Mowrer (1960a, 1960b) later extended his theory to all learning (as cited in Levis, 1989). According to the two-factor theory of avoidance (Mowrer, 1960a), an organism will respond emotionally to a neutral stimulus when it is repeatedly paired with an aversive one. The typical procedure in the laboratory is to pair a tone with electric shock. When this occurs, the organism exhibits avoidance behavior along with physiological changes (i.e., increases in heart rate, blood sugar). These changes can be referred to as anxiety or fear, and the stimulus that occasions the changes can be called a warning stimulus. Any behavior that reduces or eliminates the warning stimulus
(i.e., escape) is negatively reinforced. After numerous pairings of the tone and electric shock, the organism responds to the warning stimulus with escape before the shock occurs (as cited in Stampfl & Levis, 1967). In a minor critique of this analysis, McAllister and McAllister (1995) state that it is unfortunate that this response was termed an 'avoidance response' since the learned response "...offers escape from fear and only incidentally avoids the aversive stimulus that was involved in the fear conditioning" (p. 147). Stampfl and Levis (1967) suggested that in order to extinguish anxiety, the stimuli to which the anxiety response had been conditioned needs to be re-presented without primary reinforcement by the unconditioned aversive stimulus (i.e., electric shock). This process of presenting the conditioned aversive stimulus absent the unconditioned aversive stimulus when applied in the human clinical context has been called respondent extinction or "exposure."

Two-factor theory provides a useful scheme or heuristic at the present time for our understanding of respondent and operant extinction as applied to human clinical contexts. As previously mentioned, exposure is an efficacious treatment for specific phobias. Thus, the prevailing model by which we understand the reduction or elimination of fear behavior via the exposure intervention is through respondent and operant extinction. The extinction process relevant to Mowrer's theory pertains more to respondent extinction which weakens or eliminates control exerted by the antecedent stimuli on the conditioned fear response. The operant feature of Mowrer's theory suggests that approach behaviors will be more likely when the respondent extinction has taken place. In essence, it will be easier to shape new approach
behavior to the once feared stimuli. The avoidance responses are displaced by the approach behavior under instructional control during therapy, i.e., “I’d like you to approach the snake as close as possible.”

In addition to these basic behavioral processes which may underlie fear reduction, recent investigations suggest the co-occurrence of at least two additional components as possibly relevant: learned helplessness or “failure to escape response” and stress-induced analgesia (SIA). Both of these components appear to implicate the endogenous opioid system, which will be presented in more detail later (Teixeira, Pereira, & Hermini, 1997). Learned helplessness is a term that originated from research in the 1960s, and it has been used to describe the effect of inescapable shock on non-humans and more recently to describe analog “failure to respond” in selected human experimental arrangements. According to Peterson, Maier, and Seligman (1993), when an organism experiences inescapable shock, it learns that its behavior cannot control the shock. There is an “expectancy” that this scenario will not change in the future, and it impedes the process of (escape relevant) learning in the future. Additionally, Peterson et al. (1993) state that there is a deficit in the organism’s response initiation on the basis that the expectancy provides a reduction in the organism’s incentive to attempt making escape responses. The expectancy “…also interferes with the future learning of response-shock termination relationships, thereby producing a cognitive deficit” (p. 20).

Although Seligman and his colleagues’ work on learned helplessness has had a great deal of popular appeal in connection with such phenomena as clinical depression and responses
to aversive stimulation in general, its reliance on unproven cognitive constructs (e.g. expectancy concepts) leaves other theorists nonplused with the non-parsimonious accounting. For example, in a series of papers, Levis (1980) has called into question the possible superfluous nature of this hypothetical cognitive construct referred to as “expectancy.” Specifically, Levis (1980) suggests:

...The problem is that cognitive theories have a history of incorporating hypothetical constructs that are illusory in nature in that they can only be judged as operative after the fact by measuring the outcome or dependent variable. More precisely how does the scientist determine independent of outcome when or whether a given procedural manipulation has been registered cognitively? (p. 160)

Although the arguments supporting Levis' view are extensive and congruent with views held by this writer, a detailed analysis in the context of the present paper is not warranted as there has admittedly been little empirical work to test critical notions.

Returning to the second component underlying fear reduction, the concept of SIA arose out of laboratory research investigating underlying arousal and avoidance related to fear and pain. According to Galina and Amit (1986), a reduced reaction to painful stimuli is one of the observable results of inescapable stress. This reduced pain sensitivity, or SIA response, can be considered to be an adaptive process since it allows an organism to better allocate attention on an appropriate response for dealing with aversive stimuli. Without this process, adaptive responses (i.e., avoidance, escape, freezing) in the presence of aversive stimuli may be disrupted or blocked due to incompatible responses associated with pain, such as self-comfort (Galina & Amit, 1986).
Several researchers have identified endogenous opioids as having a role in some forms of SIA (Whitehouse, Blustein, Walker, Bersh, & Margules, 1985). Specifically, rats and mice that have been exposed to stressful events such as food deprivation (Bodnar, Kelly, Spiaggia, & Glusman, 1978), forced swimming or walking (Nakagawasai et al., 1999; Suadudeau & Costentin, 2000), predators (Kavaliers & Colwell, 1991), environmental noise (Shankar, Awasthy, Mago, & Tandon, 1999), thermal stimulation (Walker et al., 1977), and immobilization (Amir & Amit, 1978) exhibit decreased sensitivity and responsiveness to painful events (as cited in Whitehouse et al., 1985). Electric shock (Jackson, Maier, & Coon, 1979) is the most frequently used method of inducing inescapable stress in an organism (Maier, 1989). Investigators pointed to SIA mediated by increased activity in endogenous opioids as the cause of pain nociception in the above mentioned studies. Unfortunately, the blood-brain barrier does not allow direct measurement of these substances (i.e., endorphins, enkephalins, and dynorphins) and thus this hypothesis cannot be directly evaluated (Berne & Levy, 1993). Instead, researchers have had to rely on the administration of opiate antagonists (naloxone or naltrexone), which block opiates from binding to their receptors, and record the comparative effects during the presence/absence of the antagonist on pain and failure to escape behavior.

Naloxone and naltrexone are drugs in the class of opiate antagonists. They have been used extensively in experimental applications, and to a more limited degree in clinical studies. Outside of the learned fear and fear reduction areas, it has been determined that in a dose-dependent fashion, naloxone facilitates memory in non-humans (Izquierdo, Dias, Souza,
Carrasco, Elisabetsky, & Perry, 1980). In humans, naloxone has been used to reduce hunger and food intake (Wolkowitz, Doran, Cohen, & Cohen, 1988), to reduce the reinforcing effects of smoking (Gorelick, Rose, & Jarvik, 1988), and to reduce withdrawal symptoms for individuals who are addicted to opiates (Loimer, Schmid, Presslich, & Lenz, 1989).

Naltrexone has been given to humans to reduce bingeing and purging (Marrazzi, Bacon, Kinzie, & Luby, 1995), as a treatment for kleptomania (Dannon, Iancu, & Grunhaus, 1999), to reduce self-injurious behavior (White & Schultz, 2000), as a treatment for smoking cessation (King, 2002) and alcohol dependence (Guardia et al., 2002; O’Malley & Froehlich, 2003), and to reduce withdrawal and prevent relapse in those who are dependent on opiates (Tucker & Ritter, 2000).

When naloxone or naltrexone is administered to subjects before the presentation of a painful stimulus, the theory holds that these antagonists, by blocking the opioids, should also reduce the likelihood of SIA and failure to escape. Thus, an organism that is given an opiate antagonist will register pain more acutely and tolerance of aversive stimulation will decrease. As a result, escape responding will likely occur.

A typical experiment that served to underpin the effects of opiate antagonists is one conducted by Maier, Sherman, Lewis, Terman, & Liebeskind (1983). In this investigation, it was established that when a subject is exposed to many trials (i.e., 60 or 80) of inescapable shock, opiate-mediated SIA will occur. In addition, according to Whitehouse et al. (1985), opiate-mediated SIA can reoccur 24 hours after reexposure to brief inescapable shock, and
they termed this type ‘long-term analgesia’. Long-term analgesia can also occur without reexposure to shock (Hunziker, 1992). In the present context, Maier et al. (1983) noted a connection between opiate-mediated SIA and learned helplessness, since control is also very important in the latter. In regards to learned helplessness and when shock is used as the stressor, “…Exposure to inescapable shock interferes with subsequent learning to escape from shock in a different situation” (p. 81), but this does not hold true with regards to escapable shock (Maier et al., 1983). Whitehouse et al. (1985) suggested that opiate-mediated SIA and learned helplessness (failure to escape) may be linked based on research which has indicated that “the amount and temporal parameters of inescapable shock” (p. 718) are the same for producing opiate-mediated SIA and the shuttlebox escape deficit that is characteristic of a failure to escape response.

It is the relationship between endogenous opioids and inescapable aversive stimulation occasioned by exposure therapy for fear that is the focus of the present research. *In vivo* exposure clearly entails sustained aversive stimulation to participants undergoing this type of intervention. The question arises as to whether the aversion thus generated and the protocol under which it is induced, meets the parameters of “inescapable aversive stimulation.” And if these parameters are met, the correlated question arises as to whether endogenous opioids are released. Finally, a determination is required as to whether such release of endogenous opioids facilitates successful treatment outcome. The specific relationship to SIA is indirect. SIA, as will be seen, is the reputed mediator of the failure to escape. In the present context, SIA might
explain a participant's tolerance for the aversive stimulation constituting in vivo exposure.

When SIA is not produced, participants might escape the treatment protocol or treatment may be rendered less effective, i.e. subjective units of distress scores may remain high.

Review of Related Literature

Research with Non-Humans

Since the non-human literature is so voluminous in that it covers a variety of stressors and organisms, an exhaustive review would be impractical for these purposes. Instead, an attempt will be made to summarize the literature that illustrates the phenomena of SIA and learned helplessness in a clear and concise manner. This review will focus on electric shock since it has been the most prevalent method in the examination of the SIA paradigm (Maier, 1989). Experiments have focused on short-term SIA using naloxone/naltrexone (Grau, Hyson, Maier, Madden, & Barchas, 1981; Hyson, Ashcraft, Drugan, Grau, & Maier, 1982) long-term SIA using naloxone/naltrexone or morphine (Grau et al., 1981; Hunziker, 1992; Hyson et al., 1982) and the failure to escape response using the shuttlebox escape test (Besson, Privat, Eschalier, & Fialip, 1996; Maier, Sherman, Lewis, Terman, & Liebeskind, 1983; Whitehouse, Walker, Margules, & Bersh, 1983).

A good example of the typical experiment that has been conducted to investigate the phenomena of short-term SIA was conducted by Grau et al. (1981). They randomly assigned 40 rats to a naltrexone or saline group. Half of the rats in each group were exposed to shocks

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and tail-flick latency tests were used to test pain sensitivity. It was determined that rats given naltrexone had much shorter mean tail-flick latencies after 60 and 80 trials of shock in comparison to rats injected with saline, which demonstrated opiate-mediated SIA. It appears that the naltrexone blocked the analgesia that would have occurred in the latter group after 60 trials of shock.

In the typical experiment studying long-term SIA, rats are exposed to shocks or no shocks, given naloxone or saline, and then tested for pain-sensitivity with a tail-flick latency test or hot-plate test. Approximately 24 hours later, all rats are exposed to tail-flick latency tests. It has been determined that rats who are shocked and given naloxone have significantly shorter tail-flick latencies (Hunziker, 1992).

Besson, Privat, Eschalier, and Fialip (1996) were specifically interested in examining the failure to escape response in rats. The experimental procedure involved a pretraining phase in which rats were either exposed to inescapable shock (stressed rats or S rats) or no shock (non-stressed rats or NS rats) and then 48 hours later, all were exposed to an avoidance-escape task in a shuttlebox. In experiment 1, rats either received a dose of morphine or distilled water and then were exposed to the shuttlebox task. Experiment 2 involved the administration of naloxone, rather than morphine and then the rats were exposed to the shuttlebox task. Finally, during experiment 3, morphine and naloxone were used and then the rats were exposed to the shuttlebox task.
The results of experiment 1 demonstrated that morphine allowed the rats to perform better on the shuttlebox procedure. Instead of an impaired performance, the rats in the S group were able to escape successfully. Experiment 2 not only demonstrated that naloxone impaired the performance of the stressed rats in the shuttlebox procedure, but the performance of non-stressed rats was also diminished. Finally, in experiment 3, the improved shuttlebox performance through morphine was reversed by naloxone. These findings indicate that the failure to escape response may be mediated by the same system as SIA: endogenous opiates.

These studies involving non-humans have identified a number of important findings. First, there are two forms of stressed-induced analgesia: short-term and long-term. Both types seem to be mediated by opioids since the administration of naltrexone blocks the SIA effect. Short-term SIA appears to occur after numerous trials of inescapable shock (i.e., 60 or 80) and is demonstrated by shorter mean tail-flick test latencies, while long-term SIA seems to occur 24 hours after initial shock. Second, the experiments involving morphine confirm the results obtained from the investigations of long-term SIA, and further support the idea that when subjects are exposed to inescapable shock, this leads to a greater activation of the opiate system (Hyson et al., 1982). Third, the shuttlebox escape acquisition test, which has typically demonstrated a delayed or failure to escape response has been combined with experiments using shock that have produced opiate-mediated SIA. The results of these studies indicated that the shock procedures that have demonstrated opiate-mediated SIA have also produced a failure to escape response when assessed by the shuttlebox escape acquisition test (Maier et al., 1983).
1983). Maier et al. (1983) suggest that the same environmental factor or factors may be responsible for activating both opiate-mediated SIA and the failure to escape response.

Research with Humans

Studies have been conducted to investigate a similar paradigm of SIA as a result of pain in humans. For example, Pitman, van der Kolk, Orr, and Greenberg (1990) studied this phenomenon in 16 male Vietnam veterans. Eight veterans were diagnosed with posttraumatic stress disorder (PTSD) by a psychiatrist using the Structured Clinical Interview for DSM-III-R (SCID), version NP-V (Spitzer & Williams, 1987). Eight veterans served as a control group; they had no current mental disorder and never met criteria for past PTSD. All participants attended a session in which they viewed a 15-minute videotape of neutral material, a 15-min videotape segment of the movie “Platoon,” and a 30-minute neutral videotape. Prior to viewing the first neutral videotape, participants were intravenously given a 2 mg dose of either naloxone or saline. They were also given a 1 mg dose of either naloxone or saline prior to viewing the movie segment and second neutral videotape. Four participants from each group were randomly assigned to receive naloxone and four were randomly assigned to the control group. Various assessments were conducted during the experimental procedure including: skin conductance, heart rate, plasma norepinephrine, plasma epinephrine, plasma beta-endorphin, plasma met-enkephalin, corticotropin, cortisol, and emotion self-reports. Pain ratings were collected as well, using a thermal stimulus. Approximately two weeks later, participants
attended a second session with the same procedures except they were exposed to an alternate drug condition.

Results showed that individuals with PTSD who were given a placebo had a 30% reduction in pain ratings after viewing the combat scene, whereas, those with PTSD who had been given naloxone did not report a decrease in pain ratings after viewing the combat scene. It appears that opiates were at work to assist individuals who were given the placebo and that this effect was blocked by naloxone in those who were given the drug. In other words, there was an opiate-mediated SIA effect in the individuals with PTSD who were administered naloxone.

In a more recent study, Janssen and Arntz (2001) investigated SIA in a very different population: first-time parachute jumpers. Participants were recruited via advertisements in a local newspaper in a city in the Netherlands. Advertisements offered a 30% discount to novice parachute jumpers in exchange for participation in a study. A total of 24 individuals (12 males and 12 females) were recruited for the study. On the day of the jump, all participants were examined by a physician who also inserted a catheter in each participant. Electrodes were also placed on them and they completed the following questionnaires: Sensation Seeking Scale (Fey & van Zuilen, 1984; Zuckerman, 1979), trait version of the State Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lusheve, 1970), and a shortened version of Rotter’s Internal-External Control Scale (Andriessen & van Cadsand, 1983; Rotter, 1966). Blood samples were taken before and after the jump. Participants also rated threshold and tolerance for pressure pain and pain related to electrical stimulation before the jump, during the airplane flight,
and after the jump. Immediately after the jump, participants either received naloxone or placebo.

Janssen and Arntz (2001) found a significant difference between the two groups on the measure of pain. Participants in the naltrexone group provided significantly greater ratings of pain in comparison to the placebo group after the jump. They also determined that the pain sensitivity in the naloxone group was negatively related to beta-endorphin release and positively to anxiety during the jump. Again, it seems that an SIA effect mediated by endogenous opiates was detected by the authors of this study.

Three controlled studies have examined whether there is an endogenous opiate effect in humans with specific animal phobia. Egan, Carr, Hunt, and Adamson (1988) conducted a double-blind study of 12 individuals with various different phobias (i.e., heights, dogs, or elevators). These individuals received either saline or naloxone, which were administered intravenously before eight sessions of systematic desensitization. Their assessments included two physiological measures (heart rate and blood pressure) and two self-report measures: SCL-90 (administered after treatment and at one-month follow-up; Derogatis, Lipman, & Covi, 1973) and Fear Survey Schedule (administered at one-month follow-up; Wolpe & Lang, 1964). Endogenous opioids seemed to be involved since it was observed that participants who received naloxone did not have significant improvements in their SCL-90 scores (i.e. they continued to show avoidance symptoms) after treatment and at one-month follow-up in comparison to those given placebo. Further, the results of the Fear Survey Schedule indicated
a significant difference between the two groups at one-month follow-up; the placebo group had a decrease in the number of feared stimuli, whereas, the naltrexone had an increase in the number of feared stimuli they endorsed.

In a second study, Merluzzi, Taylor, Boltwood, and Gotestam (1991) randomly assigned 30 individuals with spider phobia to either placebo or naltrexone (50 mg) before one session of exposure. Their assessment measures included two physiological measures (heart rate and blood pressure) and four self-report measures: Temple Fear Survey Inventory (Braun & Reynolds, 1969), a measure of self-efficacy (Bandura, Taylor, Williams, Mefford, & Barchas, 1985), State Anxiety Inventory of the State-Trait Anxiety Inventory (Spielberger, 1983), and statements made during treatment. There was a significant increase in diastolic blood pressure and a decrease in self-efficacy in both groups across the ten steps of treatment. A significantly greater number of participants in the naltrexone group (6) dropped out of the study in comparison to the placebo group (1). Also, the naltrexone group took significantly longer than the placebo group to complete the first ten steps, and their maximum heart rate and anxiety were significantly greater at step 10 (touch spider with small brush). These findings suggest that endogenous opiates may have been involved. One concern with this study is that the investigators did not use a Behavioral Avoidance/Approach Test, which provides an assessment of physical proximity and comfort level regarding the feared animal. In other words, this is an objective measure of the individual’s avoidance behavior related to the feared animal.
This important omission would have been helpful in determining whether endogenous opioids had an effect on avoidance behavior in these participants.

In a third study, Amtz, Merckelbach, and de Jong (1993) randomly assigned 48 individuals diagnosed with spider phobia either to a placebo group, a low dose naltrexone (25 mg) group, or a high dose naltrexone group (100 mg). They used two 2-hour sessions of exposure, based on the work of Lars Öst, to treat the individuals. During the first session, participants were either given naltrexone or placebo, whereas, in the second session, they were not given any medication. Their assessment measures consisted of two physiological measures (heart rate and skin conductance level), a Behavioral Approach Test (BAT), and three self-report measures: the Spider Phobia Questionnaire (Klorman, Weerts, Hastings, Melamed, & Lang, 1974), two main subscales of the Fear Questionnaire (Marks & Matthews, 1979), and the Spider Belief Questionnaire (Amtz, Lavy, van den Berg, & van Rijsoort, 1993). The results indicated that one week after the first session, the high dose naltrexone group had significantly poorer scores on the Behavioral Approach Test in contrast to the placebo group. Although there were no significant differences between the groups on the physiological or self-report measures, Amtz et al. (1993) detected significant change scores from pre-test to the other three assessment time periods (post-test after session 1, pre-test before session 2 treatment, and post-test after session 2 treatment) for improved self-report measures, increased approach during the Behavioral Approach Test, and a decreased heart rate at the beginning of the Behavioral Approach Test.
The literature pertaining to animal phobics is minimal, but given the results of the controlled studies, there seems to be some evidence of an endogenous opiate response that occurs when an individual is exposed to a feared animal. Since there have only been three controlled studies thus far, more research is necessary before any definitive conclusions can be made. In addition, one concern is that none of the three controlled studies had a standard treatment group in which a placebo or naloxone/naltrexone was not administered. The inclusion of a standard treatment group would provide an additional control in such studies. The fact that participants thought they might be getting a drug could have affected their progress. A standard treatment group controls for this effect since participants are not exposed to the psychological effects of taking a medication.

Treatment Used in this Study

The one-session exposure treatment procedures used by Koch, Luterek, and Spates (1998) and Koch, Spates, and Kozak (2001) will be utilized for all participants in this investigation. Seventy-three participants have completed one-session exposure treatment across both studies. In addition, Öst and his colleagues have conducted multiple studies that have demonstrated the success of one-session exposure in treating specific phobia. Two examples of his work were discussed earlier in this paper (Öst, 1989; Öst, Salkovskis, & Hellstrom, 1991). Further, the American Psychological Association has endorsed the treatment protocol developed by Öst as an empirically validated treatment for specific phobia (Chambless
et al., 1998). All of this evidence indicates that the one-session exposure treatment protocol is an effective way in which to treat individuals with specific phobia. Therefore, given the established effectiveness, it appears to be an appropriate experimental vehicle for testing the effects of naltrexone. If naltrexone indeed blocks endogenous opioids and if these are essential to achievement of the positive treatment outcomes indicated above, then participants who receive the drug should have poorer outcomes than those not given the drug. Poorer outcomes may be indicated by a participant’s withdrawal from the study or by reduced performance on the behavioral or subjective ratings of distress measures. And such outcomes would be consistent with the hypothesis of endogenous opioid blockade.

Purpose of the Present Study

The aim of the present study was to assess whether there is an endogenous opiate effect during one-session exposure treatment with individuals who were diagnosed with specific phobia. A double-blind study was conducted in which participants were randomly assigned to one of the following conditions: naltrexone plus standard treatment used by Koch and colleagues (1998), placebo plus standard treatment, or standard treatment alone. The present study tested the hypothesis that the one-session exposure treatment would be less effective for individuals who were randomly assigned to the naltrexone group in comparison to the placebo or standard treatment group. The effect of treatment was measured by four self-report measures, one behavioral measure, one physiological measure, and drop-out rate across
groups. Specifically, it is hypothesized that the naltrexone group would have significantly poorer scores on all dependent measures in comparison to the other two groups. It was also hypothesized that participants in the naltrexone group would show significantly greater drop-out and failure to reach terminal criteria during treatment in comparison to individuals in the other two groups. This study extends existing research testing the role of endogenous opiates on one-session exposure treatment of specific phobias by including a Behavioral Avoidance Test across all conditions, incorporating a physiological measure across all conditions, and applying a dose of the opiate receptor antagonist naltrexone at a dose chosen from the literature (Merluzzi et al., 1991). Additionally, the study was administered in a double-blind fashion and utilized a treatment of known effectiveness within a programmatic line of investigation.
CHAPTER II

METHOD

Participants

Fifteen participants were recruited for the study from Western Michigan University, Kalamazoo College, Kalamazoo Valley Community College, and the surrounding communities. Signs were posted throughout the campuses and surrounding communities (Appendix A) and announcements were made in classes (Appendix B). Individuals who were interested in the study called the research line and left a voice mail message. A copy of the phone script that was used to return phone calls is in Appendix C. Participants qualified for the study if they met criteria for specific phobia according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV):

1. They have a marked and persistent fear that is excessive or unreasonable, cued by the presence or anticipation of a specific object or situation;

2. Exposure to the phobic stimulus almost invariably provokes an immediate anxiety response, which may take the form of a situationally bound or situationally predisposed Panic Attack;

3. The person recognizes that the fear is excessive or unreasonable;

4. The phobic situation(s) is avoided or else is endured with intense anxiety or distress;

5. The avoidance, anxious anticipation, or distress in the feared situation(s) interferes significantly with the person's normal routine, occupational functioning, or social activities or
relationships, or there is marked distress about having the phobia. (American Psychiatric Association, 1994, p. 410).

Individuals were also able to participate if they failed to meet elements of the fifth criterion. DSM-IV diagnoses were based on the Structured Clinical Interview for DSM-IV Axis I Disorders-Non-Patient Edition (SCID-I/NP; First, Spitzer, Gibbon, & Williams, 1996). In addition, participants were required to be at least 18 years of age or older and could be either male or female.

Individuals were excluded from the study if they had any of the following medical conditions: liver disease, kidney disease, heart disease, lung disease, recurring chest pain, stroke, neurological problems, or seizures. Participants were not excluded if they were diabetic unless they reported having an adverse reaction to consuming the placebo, which had dextrose in it. Additional exclusion criteria included report of drug abuse currently or in the last six months, endorsement of psychotic symptoms, ulcers in the past month, or migraines in the past month. If phobia duration had been less than six months, participants were not available for at least four sessions, they were capable of direct contact with the feared animal, they were not motivated to get rid of their fear or not prepared to tolerate possible anxiety, they were receiving positive consequences due to the phobia (i.e., insurance compensation), they were taking any of the medications listed in question #9 on the screening questionnaire (Appendix D) or they felt there would be negative consequences if their phobia was treated, they were excluded from the study. Finally, females who were nursing a child; were pregnant; or were of childbearing age and were not using a birth control pill, not using birth control injections, or had
not had a tubal ligation were excluded. The research assistant used a screening questionnaire (Appendix D) to inquire about whether the participants could be excluded on any of the criteria listed above except the psychotic symptoms and drug abuse, which were assessed using the SCID-I/NP (First et al., 1996).

Design

A 2-factor repeated measurement design with three levels on each factor was used for this study. For the between group factor, three levels comprised the treatment groups and included naltrexone plus standard treatment, placebo plus standard treatment, and standard treatment alone. The three levels for the within-group factor comprised time of assessment and included baseline, post-test, and one-month follow-up.

Setting

The sessions for this study were conducted in 2046 Haenicke Hall in a private area that was approximately 17' x 20'. A 20-gallon cage (measuring 18” high x 20” wide x 10” deep) contained the feared animal and was located on a table. Each participant approached the cage by walking on a large ruler that was labeled in feet and extended from the doorway to the cage itself.
Materials

The following equipment was used during all four sessions (baseline, treatment, post-test, and one-month follow-up): a clock, two digital stopwatches, a large ruler, an animal cage, a video camera, and a Polar Accurex Plus heart rate monitor. The clock was used to record duration of the entire treatment, while the two stopwatches were used to measure the duration of all the behavioral assessments during sessions and for interobserver reliability. The large ruler was used to determine the distance between the animal in the cage and the participant when conducting the Behavioral Avoidance Tests. The video camera was used to videotape the Behavioral Avoidance Tests in order to calculate interobserver reliability (number of agreements divided by the number of agreements plus disagreements) and to videotape treatment sessions for treatment integrity. The heart rate monitor was used to measure the participant's heart rate throughout all sessions.

Therapists

Prior to data collection, all therapists were trained in the procedures of the study. They were given written procedures (including a treatment manual) with detailed instructions to follow. All procedures were discussed and reviewed during training meetings. Practice sessions were arranged in order to determine that procedures were implemented correctly. Three doctoral-level, three master's level, and one advanced undergraduate student conducted the assessments and treatment for this study. The investigator of this study conducted some
screening/baseline sessions, but had no further contact with participants after conducting these sessions.

Animals

The animals used in this study included a corn snake, rose hair tarantula, a Long Evans black and white colored rat, and a C3H brown colored mouse. All animals were non-venomous.

Measures

Lang (1968) discussed the importance of assessing three areas of an individual when treating specific phobia: verbal behavior, overt-motor behavior, and somatic behavior. He found that a reduction in one area does not necessarily mean that there will be reductions in the other areas. For example, the individual could eliminate avoidance behavior, but continue to report that he or she is fearful. Therefore, this study measured specific phobia by utilizing four self-report measures, a behavioral measure of anxiety, and a physiological measure.

The self-report measures that were used included the following: the *Structured Clinical Interview for DSM-IV Axis I Disorders-Non-Patient Edition* (SCID-I/NP; First et al., 1996), Fear Survey Schedule (FSS; Wolpe & Lang, 1969), Spider Phobia Questionnaire (SPQ; Watts & Sharrock, 1984) or other animal specific phobia questionnaires, and Subjective Units of Discomfort Scale (SUDS). Four measures were used since self-report measures are
biased and subjective by nature. The behavioral measure that was used was the Behavioral Avoidance Test (BAT). The physiological measure used in this study was heart rate.

Self-Report Measures

The Structured Clinical Interview for DSM-IV Axis I Disorders-Non-Patient Edition (SCID-I/NP; First et al., 1996) is a semi-structured interview that allows one to diagnose a variety of different disorders categorized in the DSM-IV (American Psychiatric Association, 1994). The sections of the SCID-I/NP used in this study included psychotic, anxiety, mood, somatoform, substance dependence, and substance abuse disorders. Riskand, Beck, Berchick, Brown, and Steer (1987) found that the SCID reliably distinguished between individuals who had major depressive disorder versus those who had generalized anxiety disorder. In the Riskand et al. (1987) study, the overall kappa coefficient was 0.74. Kranzler, Kadden, Babor, Tennen, and Rounsaville (1996) investigated the validity of the SCID with a population of individuals diagnosed with substance abuse. They found evidence for concurrent validity since individuals who were diagnosed with alcohol abuse/dependence currently or in the past had a much more extensive history of family alcoholism than individuals who had never been diagnosed with either disorder. Discriminant validity and predictive validity were also established. The reliability and validity of the SCID-I/NP, which is based on DSM-IV is pending. The SCID-I/NP was administered during baseline, posttest, and one-month follow-up.
The Fear Survey Schedule (FSS; Wolpe & Lang, 1969) is a self-report questionnaire that contains 108 situations which may cause fear or unpleasant feelings. Participants provide a rating from 0 (not at all) to 4 (very much). It was originally devised as a clinical tool, but it has been increasingly used as a way to classify participants for research purposes and as a dependent measure (Klieger & McCoy, 1994). Some examples of situations include falling, dirt, mice or rats, harmless spiders, and dentists. Wolpe and Lang (1969) found that the questionnaire had test-retest reliability of 0.72. Klieger and McCoy (1994) found that it had good concurrent validity with a Behavioral Avoidance Test. It yields a total composite score and a single animal score for an animal of interest. Clinical cut-off scores have not been developed as of yet. This questionnaire was completed during baseline, posttest, and one-month follow-up.

The Spider Phobia Questionnaire (SPQ; Watts & Sharrock, 1984) consists of 38 questions in which participants answer either “yes” or “no” (Appendix E). According to Watts and Sharrock (1984), the SPQ measures coping, avoidance, preoccupation, and vigilance related to spiders. Examples of items on this questionnaire include the following: “Would you get help if you came across a spider?” “Do you think a lot about spiders?” and “Do you ever make plans in case you come across a spider?” Each “yes” answer receives one point, except for questions 2, 9, 11, 25, and 37, which are reversed scored. The lowest score possible is 0 and indicates that the participant engages in a low amount of coping, avoidance, preoccupation, and vigilance related to spiders, while the highest score is 38 and indicates a high amount of
coping, avoidance, preoccupation, and vigilance related to spiders. Muris and Merckelbach (1996) found that the SPQ could discriminate between spider phobics and non-phobic controls. In addition, they found that the SPQ had good internal consistency via test-retest reliability (0.91 and 0.91) and it was sensitive to therapeutic change observed on the Behavioral Avoidance Test. This measure yields not only a total score, but 4 subscales as well: vigilance, preoccupation, cognitive-behavioral, and avoidance. Clinical cut-off scores have not been developed yet. The SPQ was modified by Koch, Luterek, and Spates (1998) to assess coping, avoidance, preoccupation, and vigilance related to snakes and rats and mice (Appendix F). An appropriate version of the SPQ was administered during baseline, post-test, and one-month follow-up.

The Subjective Units of Discomfort Scale (SUDS) consists of a participant rating his or her anxiety from 0 to 100. A rating of 0 means "no anxiety," while a rating of 100 would be given when the client is "experiencing the worst anxiety possible" (Spiegler & Guervemont, 1993). SUDS were used during baseline, treatment, post-test, and one-month follow-up assessment.

Behavioral Measure

The Behavioral Avoidance Test (BAT) is an objective measure of the participants' avoidance behavior of the animal they fear. The BAT consists of 30 steps in which the first 13 steps are walking on a large ruler from one line to the next, each at approximately 12 inches
apart. The last 17 steps measure various amounts of time that the person touches the feared animal (i.e., 0–4 seconds). The participant initially stands in another room while the research assistant explains that he or she will be entering the other room which contains the feared animal in an enclosed cage (Appendix G). The therapist instructs the participant to “Approach the animal as much as you possibly can.” When the participant stops, the research assistant asks him or her, “Are you sure that is as far as you can go now?” This statement serves as a challenge for the participant to go further so an optimal level of performance can be reached without undue pressure. If the participant does not proceed any further, he or she reports a SUDS rating from 0 to 100. The research assistant records this SUDS rating, the duration of the BAT from beginning to end, the distance between the participant and the animal in the cage, and any overt responses the participant displayed (Appendix H). The participant is then asked if he or she would like to try it again to see how far he or she can go. If the participant wants to try the BAT again, then the same procedures just described are used again. Finally, the participant provides a rating of expected success of treatment and phobia severity (Appendix H). The research assistant also rates the severity of participant’s phobia (Appendix H). The BAT was completed during baseline, treatment, post-test, and one-month follow-up.

Physiological Measure

Heart rate was used as a continuous measure of the participant’s physiological reaction to interacting with the feared animal. Resting heart rate was assessed for two minutes (15-
second intervals) during the screening component of the first session. Heart rate was recorded over 15-second intervals during the BAT. During the treatment session, heart rate was recorded over 1-minute intervals. The data sheet in which this information was recorded is provided in Appendix I.

Session Procedures

Screening

The research assistant briefly described the purpose and requirements of participation for the study. Then the participant read the informed consent document, and the research assistant answered any questions the participant had about the study. If the participant agreed to participate, he or she signed the informed consent document (Appendix J). The participant was then asked the questions on the screening questionnaire (Appendix D), and if he or she met any of these exclusion criteria, the session was terminated and the individual was offered referral information (Appendix K). If no exclusionary criteria were met, the participant was interviewed with the SCID-I/NP (First et al., 1996). If the participant did not qualify for the study based on the SCID-I/NP (First et al., 1996), then the research assistant ended the session, informed the participant that he or she did not meet criteria for the study, and provided referral information (Appendix K). If the participant qualified for the study, then baseline assessment began.
Baseline

During this component of the study, the participant’s heart rate was monitored. He or she completed the FSS (Wolpe & Lang, 1969), and either the SPQ (Watts & Sharrock, 1984; Appendix E) or other animal specific phobia questionnaire (Appendix F). In addition, the participant completed the BAT. Finally, the participant provided a rating of expected success of treatment and phobia severity (Appendix H). The research assistant also rated the severity of participant’s phobia (Appendix H). Before the participant left this session, an appointment was scheduled for him or her to meet with the collaborating physician in order to determine whether the individual was medically fit to be in the study.

Treatment

If the collaborating physician approved the participant’s involvement in the study, then the treatment session occurred approximately one week after the baseline session. If the physician did not approve the participant’s involvement in the study, then referral information was provided (Appendix K). When the participant arrived to the session, his or her heart rate was monitored, and this was continued throughout the entire session. Each participant was randomly assigned to one of three groups: naltrexone plus standard treatment, placebo plus standard treatment, or standard treatment alone. Forty-five minutes before treatment began, participants in the naltrexone group were administered a 50 mg oral dose of the drug. This dosage level was chosen based on previous research in the area by Merluzzi et al. (1991).
Forty-five minutes was chosen in order to obtain the maximum blood level of naltrexone during treatment (Merluzzi et al., 1991). Dextrose was used for the placebo, and it was administered to each participant randomly assigned to the placebo group 45 minutes before treatment. After a research assistant (blind to the condition the participant was assigned) gave the participant the medication, he or she completed the medication checklist (Appendix L). Participants in the standard treatment group did not receive any medication, but were asked to come to the treatment session 45 minutes before treatment. This arrangement was to rule out the longer therapist contact in the other two groups as a confounding variable.

A pharmacist at Sindecuse Health Center on Western Michigan University’s campus prepared the medications. The only individuals who knew which conditions participants were assigned were the pharmacist and collaborating physician, and they did not conduct any assessments or treatments with the participants. Since this study excluded individuals for whom there may have been possible side effects (i.e., individuals with liver disease), no side effects from the use of either one of these drugs was expected. If there was a side-effect of naltrexone, it could have been nausea, a small rise in liver enzymes in the bloodstream, or inability to obtain pain relief from a narcotic pain killer for about 3–5 days after the drug is taken. The consent form did not specifically state that these side effects could occur as a result of naltrexone, and not the placebo. Therefore, the active medication (naltrexone) could not be detected by the participants.
Standard treatment in this investigation involved gradual exposure and modeling to the feared animal. The therapist provided instructions, demonstrated the task for each step, and recorded Subjective Units of Distress ratings (SUDS) of 0 to 100 on the treatment session data form (Appendix M). If the participant was in need of a break at any time, he or she was told to say “pause.” This procedural aspect was instituted so that the participant would not accidentally drop the animal or move too quickly. The therapist began treatment again after one minute by saying to the participant, “Let’s begin again.” Once all steps were completed once, the therapist and participant cycled through them again until reported SUDS levels were less than 20 on all steps.

Criteria for successfully ending treatment consisted of the participant holding the feared animal above the cage for at least one to three minutes and reporting minimal anxiety (reported SUDS level less than 20). Other criteria that could have led to termination of the session were having an extreme emotional reaction, the participant saying that he or she wanted to terminate treatment, or the three-hour time limit being reached. After treatment, the participant completed the BAT and provided ratings of expected success of treatment and phobia severity (Appendix H). The therapist also rated the severity of the participant’s phobia (Appendix H).

Post-test

This session was conducted approximately one week after the treatment session. The participant was interviewed with the specific phobia section of the SCID-I/NP (First et al.,...
1996). Heart rate was monitored, he or she completed the FSS (Wolpe & Lang, 1969), SPQ (Watts & Sharrock, 1984; Appendix E) or other animal specific phobia questionnaire (Appendix F), he or she completed the BAT, and he or she provided ratings of expected success of treatment and phobia severity (Appendix H). The research assistant also rated the participant’s phobia severity (Appendix H).

**Follow-up**

A follow-up assessment was completed approximately one month after treatment. The participant was again interviewed with the specific phobia section of the SCID-I/NP (First et al., 1996), had heart rate monitored, completed the FSS (Wolpe & Lang, 1969), SPQ (Watts & Sharrock, 1984; Appendix E) or other animal specific phobia questionnaire (Appendix F), the BAT, and provided ratings of expected success of treatment and phobia severity (Appendix H). The research assistant also provided a rating of the participant’s phobia severity (Appendix H). All participants were offered another treatment session if they felt the first session did not effectively treat their phobia. They were told that this session would be free of charge and data would not be collected. The participant’s response to this opportunity was recorded on the BAT Observation Form for the follow-up session (Appendix N). Once data collection for the study was complete, debriefing information and the results of the study were mailed to each participant (Appendix O).
Human Subject Protection

The therapist was instructed to immediately escort the participant out of the therapy room if he or she had an emotional reaction that went beyond the typical level expected for the intervention. If necessary, the therapist was instructed to use relaxation to help the client calm down and provide referral sources if necessary (Appendix K). Therapists were also instructed to never leave participants alone with the feared animal and to use the guidelines set forth by the Institutional Animal Care and Use Committee if a participant got bitten during the procedures.

Finally, according to the American Hospital Formulary Service (1995):

...When administered to opiate-free individuals in usual dosages (i.e., 50 mg daily), naltrexone generally has not caused serious adverse effects or abnormal laboratory test results (e.g., liver function). In several controlled studies, the incidence of naltrexone-associated adverse effects was similar to that reported with placebo. (p. 1423)

All of the data collected throughout the study had no identifying information listed and instead was labeled with a code number. In addition, this confidential data was kept in a locked cabinet located in 2046 Haenicke Hall. The raw data will be kept for a minimum of five years, and after publication of the results, it will be destroyed. Computerized data sets without identifying information will be retained indefinitely.
CHAPTER III

RESULTS

Preliminary Analyses

Attrition

Twenty-one individuals who initially enrolled chose not to complete the study. Fifteen of these individuals dropped out of the study prior to their appointment with the collaborating physician. Reasons for dropping out of the study prior to the physician’s appointment included: did not want to take medication (8 participants), the study involved too much time (3 participants), leaving after fall semester (1 participant), and undisclosed reasons (3 participants). The other six participants chose to drop out of the study after their appointment with the collaborating physician. Reasons for dropping out of the study after the physician’s appointment included: did not know medication was involved in the study (1 participant), did not have the time to complete the study (1 participant), and undisclosed reasons (4 participants). None of the above referenced participants had initiated intervention at the time of dropping out. They were considered enrolled because they had completed the informed consent phase of the study and agreed to participation.
Out of the 15 participants who received treatment, four were not available for post-test and follow-up assessments [three in the placebo group (participants #6, #9, and #17) and one in the standard treatment group (participant #20)]. Another two participants did not complete the follow-up assessment (only) [one in the naltrexone group (participant #2) and one in the placebo group (participant #8)]. Finally, one participant from the placebo group did not complete post-test assessment, but did complete follow-up assessment (participant #13). Non-parametric chi-square tests determined that drop-out rates were not significant from treatment to post-test assessment and from post-test assessment to follow-up assessment (p = 0.10 and p = 0.11, respectively).

Demographic Analysis of Participants

All participants in this study were unmarried, had no children, and ranged in age from 19 to 40 years old. The majority of the participants were Caucasian females who were currently attending college. Years of fear of the animal ranged from 6 to 35. Other demographic characteristics are listed in the table found in Appendix P. Overall, the demographic data was relatively equal across groups.

Analysis of Participants Who Initiated Intervention/Treatment Effects

Three participants began, but terminated the treatment phase early. Two participants were in the naltrexone group (participants #2 and #3) and one participant was in the placebo
group (participant #6). Participant #2 reported feeling sick while participant #3 refused to continue treatment any further after 140 minutes had passed. Participant #6 ended treatment due to undisclosed reasons. A non-parametric chi-square test indicated non-significant early withdrawal from treatment for all groups (p = 0.31; see Figure 1).

Eleven of the 15 participants met successful termination criteria. The four participants who did not meet successful termination criteria included participant #2 (naltrexone group), #3 (naltrexone group), #6 (placebo group) and #20 (standard treatment group). Although participant #20 made progress, the three-hour treatment session time limit was met. A non-

Figure 1. The Effect of Naltrexone on the Percentage of Participants Who Terminated Treatment Early.

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parametric chi-square test found that there was no statistically significant difference between
groups in successful completion ($p = 0.68$; see Figure 2).

![Figure 2. The Effect of Naltrexone on the Percentage of Participants Who Did Not Meet Termination Criteria.](image)

Although there were no statistically significant differences between groups on the rate of
successful completion, a one-way analysis of variance (one-way ANOVA) determined that
there were selected significant differences between those who successfully completed treatment
and those who did not on some dependent measures. In all cases, completers had significantly
lower scores on the dependent measures than non-completers, suggesting the individuals who
successfully completed treatment were able to interact with the feared animal with minimal
anxiety and less fear and avoidance. These findings were noted with the following measures at
post-test assessment: BAT contact ($p < 0.05$), BAT steps ($p < 0.01$), and maximum stopping point SUDS during the post-test BAT ($p < 0.01$), FSS specific animal item ($p < 0.01$), SPQ total score ($p < 0.01$), Preoccupation subscale of the SPQ ($p < 0.01$), Avoidance subscale of the SPQ ($p < 0.05$), and Cognitive-Behavioral subscale of the SPQ ($p < 0.01$). In addition, the maximum stopping point SUDS during the treatment BAT ($p < 0.01$) and during the follow-up BAT ($p < 0.01$) were also significantly different for successful completers versus those who did not complete treatment (see Appendix Q for figures illustrating the differences between completers and non-completers). Appendix R contains figures illustrating the responses on the dependent measures for completers and non-completers by group assignment.

On average, participants in the naltrexone group completed treatment in three cycles, participants in the placebo group finished in 2.5 cycles, and participants in the standard treatment group completed in 3.75 cycles. Treatment for each group was completed in the following minutes, on average: 93 minutes for the naltrexone group, 89 minutes for the placebo group, and 152 minutes for the standard treatment group. One-way ANOVA indicated that there were no statistically significant differences between groups for either number of cycles or treatment duration ($p = 0.47$ and $p = 0.11$, respectively; see Figures 3 and 4).

Reliability

Interobserver agreement for BAT scores was conducted during 19.1% of the sessions. Interobserver agreement was 89% for BAT Steps and 100% for BAT SUDS.
Figure 3. The Average Number of Treatment Cycles Completed By Each Group.

Figure 4. The Average Treatment Duration in Minutes Completed By Each Group.
Baseline Differences

In order to determine whether there were any significant differences between groups at baseline assessment, a one-way ANOVA was conducted with the three groups for all demographic and dependent measures. All three groups were equivalent at baseline assessment.

Treatment Outcomes

Diagnostic Outcomes

During baseline assessment, 14 participants met full criteria for specific animal phobia according to the *DSM-IV* (American Psychiatric Association, 1994). Participant #11 (naltrexone group) met criteria for specific animal phobia with a lenient E criterion (i.e., the phobia did not necessarily interfere with normal routine or cause extreme distress when not in the presence of the animal). At post-test assessment, eight participants (approximately 53%) no longer met criteria for a diagnosis of specific animal phobia (naltrexone group, participants #7, #11, and #12; placebo group, participants #1 and #8; standard treatment group, participants #4, #5, and #10). Two participants (approximately 13%) from the naltrexone group (#2 and #3) continued to meet diagnostic criteria. Five participants (approximately 33%) were unavailable for post-test assessment (four participants from the placebo group and one participant from the standard treatment group).

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At follow-up assessment, seven participants (approximately 47%) no longer met criteria for a diagnosis of specific animal phobia (naltrexone group, participants #7, #11, and #12; placebo group, participant #1; standard treatment, participants #4, #5, and #10). Two participants (approximately 13%) met criteria for a diagnosis at follow-up assessment: participant #3 (naltrexone group) and participant #13 (placebo group). Six participants (approximately 40%) were unavailable for follow-up assessment (one participant from the naltrexone group, four participants from the placebo group, and one participant from the standard treatment group). Non-parametric chi-square tests found that there were no statistically significant differences between groups in diagnostic status at post-test assessment or follow-up assessment ($p = 0.52$ and $p = 0.65$, respectively). Figures 5–7 illustrate the above descriptions.

Figure 5. The Number of Participants in Each Group Who Did Not Meet Phobia Criteria After Completing Treatment.
Figure 6. The Number of Participants in Each Group Who Continued to Meet Phobia Criteria After Completing Treatment.

Figure 7. The Number of Participants in Each Group Who Were Unavailable for Assessment During Post-test and Follow-up Sessions.
Primary Analyses

The analysis plan for the present investigation entailed a careful review of data through visual inspection for each dependent variable, followed by a statistical analysis of the findings. The small sample size did not afford great statistical power although the basic design permitted systematic replications of individual participants within each experimental condition. This approach to analysis of the data should therefore afford maximum extraction of important findings. In terms of statistical analyses, a determination as to group equivalence was made, followed by a determination as to whether there was significant change over time from baseline through each phase of assessment. A repeated measures analysis of variance (repeated measures ANOVA) was conducted on each dependent measure for the four assessment time periods (baseline, treatment for BAT measures, post-test, and follow-up) for the three experimental conditions. These statistical results must be interpreted with caution due to the small sample size.

Due to extensive drop-out during post-test and follow-up assessments, only baseline and treatment session data for the behavioral measure will be reported. The self-report data will not be discussed since it was not completed during the treatment session and no significant findings were detected. In addition, the physiological data yielded no significant findings, so this will not be discussed as well. The table in Appendix S lists the group means and standard deviations across baseline and treatment sessions for the behavioral measure. The data from the behavioral measure for all participants and each group will be displayed graphically for visual
inspection. Then an appropriate statistical analysis will be displayed in table form. Participants with missing data were not included in the statistical analyses. Please note that since most participants chose not to complete a second trial of the BAT, only the results of the first trial are analyzed and presented. Data for all measures (behavioral, subjective and physiological) during all assessment time periods (baseline, treatment, posttest, follow-up) are provided in Appendix T. Finally, Appendix U contains the means and standard deviations across all assessment time periods for all data.

**Behavioral Measure Results**

Figures V1–V3 in Appendix V display each participant's contact score on the BAT for each group from baseline assessment to treatment assessment. Visual inspection indicates all participants had no contact with the feared animal at baseline assessment. Although all participants appeared to interact with the animal during the treatment BAT, participant #1 (placebo group) was only able to touch the animal for 15 seconds. Figure 8 displays the group mean changes for the contact scores on the BAT from baseline assessment to treatment assessment. Upon visual inspection, there appears to be an increase in contact time for all three groups after they received treatment. Statistical analysis (see Table 1) confirmed a significant increase in contact scores for all three groups (p < 0.01). There were no differences between the three groups and no interactions were identified.
Figure 8. BAT Contact – Change in Group Means Across Sessions.

Table 1

<table>
<thead>
<tr>
<th>Source</th>
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<td></td>
<td></td>
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<tr>
<td>Group</td>
<td>1281.115</td>
<td>2</td>
<td>640.558</td>
<td>0.433</td>
<td>0.660</td>
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<tr>
<td>Error</td>
<td>14791.500</td>
<td>10</td>
<td>1479.150</td>
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<td>Within Subjects</td>
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<td>Time</td>
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<td>0.433</td>
<td>0.660</td>
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<tr>
<td>Error</td>
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<td>10</td>
<td>1479.150</td>
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</table>
Figures V4–V6 in Appendix V display each participant’s score for each group on the BAT steps from baseline assessment to treatment assessment. The scores of 0–30 pertained to how physically close the individual could be to the feared animal. Upon visual inspection, it appears that all participants who completed treatment had an increase on distance during the BAT. Figure 9 displays the group mean changes from baseline assessment to treatment assessment for the BAT steps. Visual inspection indicates a significant increase in scores for all three groups. Statistical analysis (see Table 2) confirmed a significant increase in contact scores for all three groups after treatment ($p < 0.01$), but there were no differences between groups and no interactions were detected.

![Figure 9. BAT Steps – Change in Group Means Across Sessions.](image)

Figure 9. BAT Steps – Change in Group Means Across Sessions. [Steps 0–13 refer to lines on a large ruler that were approximately 12 inches apart in length. Steps 14–18 refer to different aspects of touching the cage where the feared animal was located. Steps 19–30 refer to various amounts of time in seconds the participants were in physical contact with the feared animal (i.e., step 19 = 0–4 seconds of non-continuous contact).]
Table 2

BAT Steps Results for Repeated-Measures ANOVA

<table>
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<tr>
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<td>Within Subjects</td>
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<td>Time</td>
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<td>3.748</td>
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<td>Error</td>
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<td>7.435</td>
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</table>

Figures V7–V9 of Appendix V display each participant’s BAT maximum stopping point SUDS level for each group from baseline assessment to treatment assessment. Visual inspection indicates that in comparison to baseline SUDS levels, all participants who completed treatment had dramatic reductions in SUDS levels during the treatment BAT with the exception of participant #3 (naltrexone group) and participant #20 (standard treatment group). Figure 10 displays the group mean changes for the BAT maximum stopping point SUDS level from baseline assessment to treatment assessment. Upon visual inspection, there appears to be a decrease in reported SUDS levels after participants received treatment. Statistical analysis (see Table 3) confirmed this decrease for all three groups (p < 0.01), but there were no differences between the groups or interactions.
Figure 10. BAT SUDS at Maximum Stopping Point – Change in Group Means.

Table 3

<table>
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<tr>
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<td>Time x Group</td>
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<td>431.194</td>
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<td>Error</td>
<td>6755.150</td>
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<td>675.515</td>
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</table>
Figures V10–V12 of Appendix V display each participant’s SUDS level at the BAT baseline stopping point for each group from baseline assessment to treatment assessment. Visual inspection suggests that in comparison to baseline assessment, most participants who completed treatment had large reductions in their reported SUDS levels at the baseline stopping point when assessed during the treatment BAT. In fact, all but participant #12 (naltrexone group) reported a SUDS level of 0 during treatment assessment. Figure 11 displays the group mean changes for the SUDS level at the BAT baseline stopping point from baseline assessment to treatment assessment. Visual inspection shows a dramatic reduction in SUDS levels after the participants completed treatment with statistical analysis (see Table 4) confirming this decrease for all three groups ($p < 0.01$). Differences between the groups were not detected and there were no interactions.

![Figure 11. BAT SUDS at Baseline Stopping Point – Change in Group Means.](image-url)

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Table 4

BAT SUDS at Baseline Stopping Point Results for Repeated Measures ANOVA

<table>
<thead>
<tr>
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<td>Group</td>
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<td>91.281</td>
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<td>Time</td>
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<td>Time x Group</td>
<td>369.138</td>
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<td>5834.400</td>
<td>10</td>
<td>583.440</td>
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</table>

Figures V13–V15 of Appendix V display the frequency with which each participant engaged in overt responses during the BAT for each group. Overt responses were comprised of non-verbal behaviors the therapist observed the participant engaging in during the BAT. These responses include shaking/trembling, crying/eyes watering, holding self, turning away/not looking, and other. These responses were added together to create a total score for each participant. Upon visual inspection, it appears that all participants either reduced or maintained the number of overt responses during treatment assessment. Figure 12 displays the group mean changes for overt responses during the BAT from baseline assessment to treatment assessment. Recall that this measure was intended as an indirect indication of fear and/or anxiety. Although
visual inspection suggests a slight reduction in overt responses, this reduction was marginally significant across time (p = 0.056). There were no differences between the groups and no interactions were identified (see Table 5).

Figures V16–V18 of Appendix V display the therapist’s rating of each participant’s phobia severity during the BAT for each group from baseline assessment to treatment assessment. Visual inspection suggests reduced or maintained phobia severity for all participants at treatment assessment. Figure 13 displays the group mean changes for the therapist rating of the participant phobia severity during the BAT from baseline assessment to treatment assessment. Upon visual inspection, it is apparent that therapists rated participants in
Table 5

Overt Responses during the BAT Results for Repeated Measures ANOVA

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<tr>
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<tr>
<td>Group</td>
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<td>Error</td>
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<td><strong>Within Subjects</strong></td>
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<tr>
<td>Time</td>
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<td>8.502</td>
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<tr>
<td>Time x Group</td>
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<td>1.828</td>
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Figure 13. Therapist Rating of Participant Phobia Severity – Change in Group Means.
all three groups as having a reduction in phobia severity after they received treatment and statistical analysis provided confirmation (p < 0.01). Again, no group differences or interactions were detected (see Table 6).

Table 6

<table>
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<tr>
<th>Source</th>
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<td>Group</td>
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<td>Time</td>
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<td>24.000</td>
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<td>Time x Group</td>
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<td>0.861</td>
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</table>

Figures V19–V21 of Appendix V display each participant’s rating of phobia severity during the BAT for each group from baseline assessment to treatment assessment. Upon visual inspection, it seems that participants either rated themselves as having the same or reduced severity during the treatment assessment with the exception of participant #13 who provided a higher rating of phobia severity (placebo group). Figure 14 displays the group mean changes for phobia severity rated by participants during the BAT from baseline assessment to treatment assessment. Visual inspection indicates a reduction in phobia severity in all groups after they
had completed treatment. Statistical analysis (see Table 7) confirmed this reduction \( p < 0.05 \).

There were no differences between groups and no interactions were detected.

Figures V22–V24 of Appendix V display each participant’s rating on the Expected Success of Treatment Scale for each group from baseline assessment to treatment assessment. Visual inspection shows that all participants had increased scores or maintained their scores on this scale after treatment, suggesting that their confidence in the success of treatment was on the rise. Figure 15 displays the group mean changes for the Expected Success of Treatment Scale from baseline assessment to treatment assessment. Visual inspection indicates a slight increase in scores on this scale after participants had received the intervention. The statistical analysis

Figure 14. Participant Rating of Phobia Severity – Changes in Group Means.
Table 7

Participant Rating of Phobia Severity Results for Repeated Measures ANOVA

<table>
<thead>
<tr>
<th>Source</th>
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<td>Group</td>
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Figure 15. Expected Success of Treatment Scale – Change in Group Means.
(see Table 8) determined that this increase was not significant ($p < 0.01$), there were no differences between groups, and there were no interactions.

Table 8

Expected Success of Treatment Scale Results for Repeated Measures ANOVA

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<td>Group</td>
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<td>0.598</td>
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CHAPTER IV

DISCUSSION

The results of this investigation provide little support for the hypothesis that endogenous opiates serve as an explanatory mechanism for the effectiveness of one-session exposure treatment. It was hypothesized that one-session exposure treatment would be less effective for the naltrexone plus standard treatment group in comparison to the other two groups (placebo plus standard treatment group and standard treatment alone group) as assessed by one or more dependent measures or as reflected in drop-out during treatment. The results of this investigation did not support this hypothesis since there were no reliably observed differences between the groups on any dependent measures or on rates of drop-out. Within-subjects effects for the behavioral measures were detected for all three groups in this study, suggesting that all three groups had significant improvement in fear and avoidance symptoms after receiving one-session exposure treatment.

Previous work in this area by Arntz et al. (1993), Egan et al. (1988), and Merluzzi et al. (1991) demonstrated significant between-group differences on self-report, behavioral, and physiological measures, whereas, the present investigation did not reveal differences between groups on any of the dependent measures. Egan et al. (1988) used eight sessions of systematic desensitization to treat participants, while Merluzzi et al. (1991) utilized one-session exposure
treatment. Arntz et al. (1993) provided two sessions of treatment. During the first session, participants were given either naltrexone or placebo along with one-session exposure treatment, and during the second, participants attended one-session exposure treatment without medication. When Egan et al. (1988) compared individuals given naloxone versus those given placebo, there were significant differences between the two on self-report measures. The naltrexone rather than the placebo group lacked improved scores on the measures. Merluzzi et al. (1991) found three significant differences between the naltrexone and placebo group. The naltrexone group had significantly greater rates of attrition. Also, it took participants in the naltrexone group significantly longer to complete step 10 on the BAT and they had significantly greater anxiety and heart rate at step 10. Finally, Arntz et al. (1993) determined that the placebo group was able to complete significantly more steps on the Behavioral Approach Test when compared to the high dose naltrexone group (100 mg dose). The discrepant findings between this study and the Egan et al. (1988) study may be due to the fact that the studies used different treatments (one-session exposure versus systematic desensitization). However, the studies by Arntz et al. (1993) and Merluzzi et al. (1991) used the same type of treatment as the present investigation and obtained different findings than the current study.

Although the hypothesis of this study was not supported, there were some interesting findings. Significant differences were detected between those who did and those who did not successfully complete treatment. The individuals who did not successfully complete treatment included two individuals in the naltrexone group, one in the placebo group, and one in the
standard treatment group. Of these four participants who did not meet termination criteria, the participant in the standard treatment group made the most progress. This individual was able to complete one full cycle of treatment steps and part of another cycle by the three-hour time limit. The other three participants withdrew from treatment prematurely.

Anecdotal evidence indicates that naltrexone had a negative effect on the treatment experience for participants #2 and #3. Participant #2 became ill with symptoms of nausea during the treatment, and as a result, withdrew early and was unable to complete the treatment BAT. Participant #3 was involved in five cycles with a minimal reduction in SUDS levels. According to the therapist, after 2.5 hours, this participant became very agitated and demanded that treatment end. Across three separate investigations of this intervention at WMU, this type of reaction has never been observed. There is some indication that it may have been due to the medication on the basis of a case presented by Ibarra, Bruehl, McCubbin, Carlson, Wilson, Norton et al. (1994). In their article, Ibarra et al. (1994) described the effects of naltrexone on a male individual diagnosed with PTSD. He was given 50 mg of naltrexone and according to the individual, approximately two hours later, he experienced unusual symptoms. He had visual problems and became very upset at his wife even though she was just kidding with him. According to the individual, his anger was out of proportion to the event that occurred between him and his wife. In addition, he felt that he was out of control and this disturbed him greatly. One-session exposure treatment can be a stressful experience; it is entirely possible that
participant #3 acted in this manner because of the medication or this may be the usual way he copes with stressful situations.

Finally, some might hypothesize that state-dependent learning could account for the results of this study. State-dependent learning refers to the idea that “...responses or behaviors that are learned under a given drug condition are more easily retrieved when the subject is tested under the same drug condition than under a different drug condition or when no drugs are given” (Reus, Weingartner, & Post, 1979, p. 927). Although there has been interest in state-dependent learning since around 1830, strong scientific interest in the phenomena did not occur until 1950 (Overton, 1991). This phenomena was first studied in non-humans in drug discrimination experiments that studied whether animals could discriminate between states (particular drug and dose vs. another drug, placebo, or the same drug with a different dose) on the basis of stimulus properties (Reus, Weingartner, & Post, 1979). Research has continued in the years following these initial studies and has included testing the effects of naloxone in non-humans. For example, rats who have received training in various tasks and have been given naloxone after this training, have significantly better retention of these tasks in comparison to those given morphine (Izquierdo, 1979).

The kind of experiment that could test the phenomenon of state-dependent learning would be different from the design of the current investigation. In the simplest way to test this phenomenon, four groups and two treatment sessions would be required. Participants would be exposed to naltrexone or placebo during the first session. During the second session, half of the
naltrexone group would be given naltrexone and the other half would be given placebo, while half of the placebo group would be given naltrexone and the other half would be given placebo. It would be hypothesized that participants given the placebo during both sessions would have the best treatment outcome. In general, those given the same drug during both sessions would have consistent intersession treatment outcomes than those who were given different drugs during the two sessions.

Limitations

The primary limitation of this study was the sample size. It was originally proposed that 45 individuals would participate in this investigation. This number was based on the previous studies in this area of research. Unfortunately, it was very difficult to recruit an ample number of participants given the size of the Kalamazoo area along with the fact that participants were not being paid. There is a strong possibility that the hypothesis was not confirmed because of the small sample size. Visual inspection of the data is suggestive of a less robust effect for subjects in the naltrexone condition. The small sample size may not have provided enough power to detect statistically significant differences if they existed.

Another limitation was the missing data at the post-test and follow-up assessments. Five participants (approximately 33%) were unable to complete post-test assessment and six participants (40%) were not able to attend the follow-up assessment. The primary statistical analyses involved repeated measures ANOVA, which drop missing data from analyses. If
these participants had completed these assessments, this may have led to different results since
the analyses would have considered all 15 participants instead of just eight participants.

Future Research Recommendations

The small number of individuals involved in this investigation is the likely explanation as
to why statistically significant differences between the groups were lacking. Given the results of
previous studies in this area (Arntz et al., 1993; Egan et al., 1988; Merluzzi et al., 1991) in
which between-group differences on at least one dependent measure was detected, it is
premature to conclude from the current study that further research should not be pursued.
Therefore, it is recommended that a study with a larger number of participants be conducted. In
order to enroll a larger number of participants and to reduce missing data at follow-up sessions,
compensation could be provided to defray the costs of attending a session and any general
inconvenience for the participants. Another recommendation would be to provide more
information about naltrexone during the first session. Although participants received information
about the drug during the first session of this study, they did not obtain detailed information until
the second session. Providing detailed information during the first session could reduce the
number of individuals who drop out prior to the second session due to a fear of taking the
medication.

Additionally, if endogenous opiates were released, there is an assumption that
participants were placed in an inescapable aversive situation. It is possible that the treatment
conducted in this study was not inescapable aversive stimulation since research ethics demand, and informed consent explicates, that participants can withdraw from the study at any time. Further, participants were allowed to pause during the course of treatment, which can be viewed as a momentary escape. Since it is unlikely that HSIRB will alter the ‘withdrawal’ policy, a future study might assess whether participants felt that treatment was aversive. This was not attempted in the present study, but it could be accomplished by administering a scale such as the Distress Evaluation Scale (Devilly, personal communication, November, 1998). This scale assesses treatment intrusiveness, treatment acceptability, and whether the participants would recommend the treatment. In addition, in a future study, the pause procedure could be eliminated. The pause procedure provides a momentary escape from the treatment procedure. If this aspect was removed, this may contribute to the individual feeling as if he or she could not escape the procedure.

Finally, it is also possible that the 50 mg dose of naltrexone used in this study was not enough medication to block the opiates from binding to their receptors if in fact they were released. This dosage level was selected based on the Merluzzi et al. (1991) study, since some effects of the medication were detected. Arntz et al. (1993) found that the 25 mg dose did not seem to have an effect, whereas the 100 mg dose did have some effects. In this study, the conservative dose of 50 mg was used since the original sample size was 45 participants. A larger dose might want to be considered for a future study.
Appendix A

Recruitment Sign
Clinical researchers at Western Michigan University are currently seeking individuals to participate in an investigation of the role of physiology during the treatment of small animal fears:

Snakes ♦ Spiders ♦ Rats ♦ Mice

If you currently experience intense fear or avoidance in the presence of any of the above animals you may be eligible for participation in this study.

Participation will involve answering questions, completing several questionnaires, having heart rate monitored, and attending at least 4 sessions at WMU. You must be at least 18 years old to participate.

If you would like to find out more about this study please contact Andrea at (616) 387-4332.
Appendix B

Recruitment Announcement
Recruitment Script for Obtaining Participants in Classes

(Introduce yourself) Today, I am going to talk to you about a research study being conducted through the clinical psychology department at Western Michigan University in the hope of recruiting participants.

This study is for individuals who experience intense fear or avoidance of any of the following animals: snakes, spiders, rats, or mice. This study is investigating the role of physiology during the treatment of small animal fears. Participation involves answering questions, completing questionnaires, having heart rate monitored, and attending at least four sessions. One of these sessions will be a treatment session in which you will be assisted in approaching the animal you fear. You must be 18 years or older to participate.

If you are interested in participating in the study, or would like to learn more about the study, please take a card. The card has the research line phone number on it, so just call this number and leave your name, phone number, and the best time to call you back. (Pass the cards out)

Thank you for your time.

Recruitment Card

A business card that states:

Do you fear and/or avoid spiders, snakes, rats, or mice? If so, you may qualify for a treatment study at WMU. Participation involves completing questionnaires, having heart rate monitored, and attending five sessions. You must be at least 18 years old to participate. Please call Andrea Kozak at (616) 387-4332 if you would like more information or are interested in participating.
Appendix C

Phone Script
Phone Script

Hi, my name is _____________ and I am returning your call regarding the small animal phobia study. This research study is targeting fears of snakes, spiders, rats or mice. If you experience intense anxiety or avoidance in the presence of any of these animals, you may qualify for the study. This study is investigating the role of physiology during the treatment of small animal fears, and involves having heart rate monitored, answering some questions, and filling out questionnaires. In the course of the study, you will be offered treatment for your small animal fear. Participation involves at least four sessions. The first session will take about 1 1/2 hours to complete and will determine if you qualify for further participation. The second session is the treatment session and is the longest session involving no more than three hours in length. The third and fourth session will be approximately one hour each. Do you have any specific questions that I could answer for you? Would you like to schedule an initial appointment to determine if you qualify for the study? Thank you for your time.
Appendix D

Screening Questionnaire
Screening Questionnaire

Participant Number:______ Date:______________ Assistant:______

1. What is your age? _______

2. What specific small animal fear are you seeking treatment for (circle one)?
   Snake   Spider   Rat   Mouse

3. Have you had this fear for over 6 months? Yes No
   If yes, how long?______

4. Have you ever had a history of the following conditions:
   Liver disease Yes No
   Kidney disease Yes No
   Heart disease Yes No
   Lung disease Yes No
   Recurring chest pain Yes No
   Stroke Yes No
   Neurological problem Yes No

5. Are you currently experiencing (within the last 30 days) the following conditions:
   Ulcer Yes No
   Migraine Yes No

6. Are you diabetic? Yes No
   If yes, do you have an adverse reaction when consuming sugar? Yes No
7. For females only: since participation in this study involves the possible administration of one of two different drugs, we are attempting to prevent in utero exposure by asking the next few questions that follow.
   a. Are you able to have children? Yes No
      If no, please explain:
   b. Are you pregnant? Yes No
   c. Are you using birth control? Yes No
      Is yes, what type? Pill Injections
      Other-Please name and explain:

8. Are you nursing a child? Yes No

9. Are you taking any of the following medications:
   Antabuse Yes No
   Lithium Yes No
   Tricyclic Antidepressant (Elavil, Etrafon, Limbitrol, Norpramin, Sinequan, Surmontil, Triavil, or Vivactil) Yes No
   Thioridazine Yes No

10. Are you taking any other medications? Yes No
    If yes, please list medication name, dosage amount, and length of time taking each medication:

11. Are any of the above medications taken for your phobic condition? Yes No
    If yes, are they working?
12. Are you currently receiving treatment specifically for your phobic condition?  
   Yes  No

   If yes, please specify information about what the treatment entails:

13. Are you available for at least 4 sessions (1st, 3rd, and 4th session will be no longer than 2 hours; 2nd session will be no longer than 3 hours) over the next year?  Yes  No

14. Do you want to get rid of your animal fear?  Yes  No

15. If yes, are you willing and prepared to tolerate some anxiety during treatment?  
   Yes  No

16. Are you currently receiving any benefits (i.e., insurance compensation, threat of a legal claim, etc.) due to your phobia?  Yes  No

17. Do you foresee any negative consequences occurring if your phobia is successfully treated?  Yes  No
Appendix E

Spider Phobia Questionnaire
Spider Phobia Questionnaire

Participant Number: _______ Date: ___________ Baseline Posttest Follow-up

Please circle yes or no for the following statements:

1. Do you check the lounge for spiders before sitting down? Yes No
2. Can you deal effectively with spiders yourself when you find them? Yes No
3. Do you sometimes dream about spiders? Yes No
4. Do you ever make plans in case you come across a spider? Yes No
5. Do you sometimes look at the corners of the room for spiders? Yes No
6. Do you get other people to get rid of spiders when you find them? Yes No
7. When imagining a spider, is it always the same one or kind? Yes No
8. Do you think a lot about spiders? Yes No
9. Would you know how to cope with spiders in the bath? Yes No
10. When watching television, would you notice a spider crawling across the floor elsewhere in the room? Yes No
11. Do you sometimes use a book or a newspaper to deal with a spider? Yes No
12. Do you worry more about spiders than most people? Yes No
13. Do you feel a lot more secure if someone else is in the house, in case you come across a spider? Yes No
14. When you imagine a spider, can you see parts of it in great detail? Yes No
15. Do you check the bedroom for spiders before going to sleep? Yes No
16. When you find a spider in a room, would you avoid going in that room until someone else had removed it? Yes No
17. Do you ever find yourself thinking about spiders for no reason? Yes No
18. Would you get help if you came across a spider? Yes No
19. Do you ever lie in bed at night and listen out for spiders? Yes No
20. If you thought you saw a spider would you go for a close look? Yes No

-Please continue on back-
21. Do you sometimes find it an effort to keep thoughts of spiders off your mind?  
Yes No

22. Would your mind be a lot easier if spiders didn’t exist?  
Yes No

23. Are you always on the lookout for spiders?  
Yes No

24. Do you often think about particular parts of spiders for example the fangs?  
Yes No

25. If you find a spider in the bath, would you, say, use a shower to wash the spider down the plughole?  
Yes No

26. Are you sometimes distracted by thoughts of spiders?  
Yes No

27. Have you a “plan for action” in case you find a spider in the kitchen?  
Yes No

28. Are you sometimes haunted by thoughts of spiders?  
Yes No

29. Do you make very certain there are not spiders around before taking a bath?  
Yes No

30. If you discover a spider in the room, do you leave the room straight away?  
Yes No

31. When watching television do you think more about the danger of there being a spider in the room than about the program?  
Yes No

32. When you see a spider, does it take a long time to get it out of your mind?  
Yes No

33. Do you sometimes sense the presence of a spider without actually seeing it?  
Yes No

34. Are you slightly scared to enter a room, say a bathroom, where spiders have been in the past?  
Yes No

35. If there’s a spider in the house, are you the most likely person to find it?  
Yes No

36. Have you had nightmares about spiders?  
Yes No

37. Would you think about using a broom to deal with a spider in the kitchen?  
Yes No

38. Can you spot a spider out of the corner of your eye?  
Yes No
Appendix F

Modified Spider Phobia Questionnaires
Snake Phobia Questionnaire

Participant Number: _________ Date: ___________ Baseline  Posttest  Follow-up

Please circle yes or no for the following statements:

1. Do you check the ground for snakes before walking in the grass? Yes No
2. Can you deal effectively with snakes yourself when you find them? Yes No
3. Do you sometimes dream about snakes? Yes No
4. Do you ever make plans in case you come across a snake? Yes No
5. Do you sometimes look at the ground for snakes? Yes No
6. Do you get other people to get rid of snakes when you find them? Yes No
7. When imagining a snake, is it always the same one or kind? Yes No
8. Do you think a lot about snakes? Yes No
9. Would know how to cope with snake on the ground? Yes No
10. When outside, would you notice a snake moving across the ground? Yes No
11. Do you sometimes use a stick to deal with a snake? Yes No
12. Do you worry more about snakes than most people? Yes No
13. Do you feel a lot more secure if someone else is outside, in case you come across a snake? Yes No
14. When you imagine a snake, can you see parts of it in great detail? Yes No
15. Do you check outside for snakes before going outside? Yes No
16. When you find a snake outside, would you avoid going outside until someone else had removed it? Yes No
17. Do you ever find yourself thinking about snakes for no reason? Yes No
18. Would you get help if you came across a snake? Yes No
19. Do you ever go outside and listen for snakes? Yes No
20. If you thought you saw a snake would you go for a close look? Yes No

-Please continue on back-

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21. Do you sometimes find it an effort to keep thoughts of snakes out of your mind?  Yes  No
22. Would your mind be a lot easier if snakes didn't exist?  Yes  No
23. Are you always on the lookout for snakes?  Yes  No
24. Do you often think about particular parts of snakes for example the fangs?  Yes  No
25. If you find a snake outside, would you attempt to remove it?  Yes  No
26. Are you sometimes distracted by thoughts of snakes?  Yes  No
27. Have you a "plan for action" in case you find a snake outside?  Yes  No
28. Are you sometimes haunted by thoughts of snakes?  Yes  No
29. Do you make very certain there are not snakes around before going outside?  Yes  No
30. If you discover a snake outside, do you leave right away?  Yes  No
31. When outside do you think more about the danger of there being a snake than about what you are doing?  Yes  No
32. When you see a snake, does it take a long time to get it out of your mind?  Yes  No
33. Do you sometimes sense the presence of a snake without actually seeing it?  Yes  No
34. Are you slightly scared to go outside where snakes have been in the past?  Yes  No
35. If there's a snake outside, are you the most likely person to find it?  Yes  No
36. Have you had nightmares about snakes?  Yes  No
37. Would you think about using a broom to deal with a snake outside?  Yes  No
38. Can you spot a snake out of the corner of your eye?  Yes  No
Rat/Mouse Phobia Questionnaire

Participant Number: ______________ Date: __________ Baseline Posttest Follow-up

Please circle yes or no for the following statements:

1. Do you check the ground for rats/mice before walking outside or inside? Yes No
2. Can you deal effectively with rats/mice yourself when you find them? Yes No
3. Do you sometimes dream about rats/mice? Yes No
4. Do you ever make plans in case you come across a rat/mouse? Yes No
5. Do you sometimes look at the ground for rats/mice? Yes No
6. Do you get other people to get rid of rats/mice when you find them? Yes No
7. When imagining a rat/mouse, is it always the same one or kind? Yes No
8. Do you think a lot about rats/mice? Yes No
9. Would you know how to cope with rat/mouse on the ground? Yes No
10. When inside or outside, would you notice a rat/mouse moving across the ground? Yes No
11. Do you sometimes use a broom to deal with a rat/mouse? Yes No
12. Do you worry more about rats/mice than most people? Yes No
13. Do you feel a lot more secure if someone else is inside or outside in case you come across a rat/mouse? Yes No
14. When you imagine a rat/mouse, can you see parts of it in great detail? Yes No
15. Do you check inside or outside for rats/mice before going inside or outside? Yes No
16. When you find a rat/mouse inside or outside, would you avoid going inside or outside until someone else had removed it? Yes No
17. Do you ever find yourself thinking about rats/mice for no reason? Yes No
18. Would you get help if you came across a rat/mouse? Yes No
19. Do you ever sit inside and listen for rats/mice? Yes No
20. If you thought you saw a rat/mouse would you go for a close look? Yes No

-Please continue on back-
21. Do you sometimes find it an effort to keep thoughts of rats/mice out of your mind?  
   Yes  No

22. Would your mind be a lot easier if rats/mice didn't exist?  
   Yes  No

23. Are you always on the lookout for rats/mice?  
   Yes  No

24. Do you often think about particular parts of rats/mice?  
   Yes  No

25. If you find a rat/mouse inside or outside, would you attempt to remove it?  
   Yes  No

26. Are you sometimes distracted by thoughts of rats/mice?  
   Yes  No

27. Have you a "plan for action" in case you find a rat/mouse inside or outside?  
   Yes  No

28. Are you sometimes haunted by thoughts of rats/mice?  
   Yes  No

29. Do you make very certain there are not rats/mice around before going inside or outside?  
   Yes  No

30. If you discover a rat/mouse inside or outside do you leave right away?  
   Yes  No

31. When inside or outside do you think more about the danger of there being a rat/mouse than about what you are doing?  
   Yes  No

32. When you see a rat/mouse, does it take a long time to get it out of your mind?  
   Yes  No

33. Do you sometimes sense the presence of a rat/mouse without actually seeing it?  
   Yes  No

34. Are you slightly scared to go inside or outside where rats/mice have been in the past?  
   Yes  No

35. If there's a rat/mouse inside or outside, are you the most likely person to find it?  
   Yes  No

36. Have you had nightmares about rats/mice?  
   Yes  No

37. Would you think about using a broom to deal with a rat/mouse inside or outside?  
   Yes  No

38. Can you spot a rat/mouse out of the corner of your eye?  
   Yes  No
Appendix G

BAT Steps
### Behavioral Avoidance Test Steps

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Does not enter the room.</td>
</tr>
<tr>
<td>1</td>
<td>Completely crosses the line at number 1.</td>
</tr>
<tr>
<td>2</td>
<td>Completely crosses the line at number 2.</td>
</tr>
<tr>
<td>3</td>
<td>Completely crosses the line at number 3.</td>
</tr>
<tr>
<td>4</td>
<td>Completely crosses the line at number 4.</td>
</tr>
<tr>
<td>5</td>
<td>Completely crosses the line at number 5.</td>
</tr>
<tr>
<td>6</td>
<td>Completely crosses the line at number 6.</td>
</tr>
<tr>
<td>7</td>
<td>Completely crosses the line at number 7.</td>
</tr>
<tr>
<td>8</td>
<td>Completely crosses the line at number 8.</td>
</tr>
<tr>
<td>9</td>
<td>Completely crosses the line at number 9.</td>
</tr>
<tr>
<td>10</td>
<td>Completely crosses the line at number 10.</td>
</tr>
<tr>
<td>11</td>
<td>Completely crosses the line at number 11.</td>
</tr>
<tr>
<td>12</td>
<td>Completely crosses the line at number 12.</td>
</tr>
<tr>
<td>13</td>
<td>Completely crosses the line at number 13.</td>
</tr>
<tr>
<td>14</td>
<td>Leans forward and looks in cage.</td>
</tr>
<tr>
<td>15</td>
<td>Touches the outside of the animal cage.</td>
</tr>
<tr>
<td>16</td>
<td>Touches the top of the animal cage.</td>
</tr>
<tr>
<td>17</td>
<td>Touches the bottom of the animal cage away from the animal.</td>
</tr>
<tr>
<td>18</td>
<td>Touches the inside bottom of the animal cage near the animal.</td>
</tr>
<tr>
<td>19</td>
<td>Touches the animal for 0-4 seconds not continuously.</td>
</tr>
<tr>
<td>20</td>
<td>Touches the animal for 0-4 seconds continuously.</td>
</tr>
<tr>
<td>21</td>
<td>Touches the animal for 5-19 seconds not continuously.</td>
</tr>
<tr>
<td>22</td>
<td>Touches the animal for 20-60 seconds not continuously.</td>
</tr>
<tr>
<td>23</td>
<td>Touches the animal for 5-19 seconds continuously.</td>
</tr>
<tr>
<td>24</td>
<td>Touches the animal for 20-39 seconds continuously.</td>
</tr>
<tr>
<td>25</td>
<td>Touches the animal for 40-59 seconds continuously.</td>
</tr>
<tr>
<td>26</td>
<td>Touches the animal for 60 seconds or more continuously.</td>
</tr>
<tr>
<td>27</td>
<td>Picks the animal up for 1-19 seconds.</td>
</tr>
<tr>
<td>28</td>
<td>Picks the animal up for 20-39 seconds.</td>
</tr>
<tr>
<td>29</td>
<td>Picks the animal up for 40-59 seconds.</td>
</tr>
<tr>
<td>30</td>
<td>Picks the animal up for 60 seconds or more.</td>
</tr>
</tbody>
</table>
Appendix H

BAT Observation Form
Participant Number: ___________ Date: ___________ Assistant: ___________

Session (circle one): Baseline Treatment Posttest Follow-up

Observation Form for Behavioral Avoidance Test (BAT)

Duration Measure: Time in seconds from beginning of the BAT until the SUDS.
Total Trial One: ___________ Total Trial Two: ___________
Contact time: ___________ Contact time: ___________

Distance Measure: Number on last fully passed mark or on BAT criteria.
Trial One: ___________ Trial Two: ___________

SUDS: Rating given by the participant following the assistant’s final verbal prompt.
Trial One: ___________ Trial Two: ___________

Baseline Level (Step ) SUDS: ___________

Overt Responses—Check all that apply:

<table>
<thead>
<tr>
<th>Item</th>
<th>Trial 1</th>
<th>Trial 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shaking/Trembling</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Crying/Eyes Watering</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Holding Self</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Turning Away/Not looking</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Other (__________________)</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

Comments: The subject’s response to the BAT and level of severity:

______________________________________________________________

-Please continue on back-

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Assistant’s and Subject’s rating of phobia severity:

Please rate the severity of your phobia symptoms according to the following scale:

1 = Symptom free and not disabling.
2 = Slightly severe and disabling.
3 = Moderately severe and disabling.
4 = Excessively severe and disabling.
5 = Extremely severe and disabling.

Assistant’s rating for severity of phobia: __________ (rate prior to asking for the subject’s rating)

Subject’s rating for phobia severity: __________

Subject’s rating of expected success of treatment:

Having now been given the explanation for the treatment (Having now received the treatment), please express your current level of confidence regarding the treatment outcome:

1 = Extremely skeptical that the treatment will have positive effects.
2 = Somewhat skeptical that the treatment will have positive effects.
3 = Withholding judgment; equally confident and skeptical.
4 = Somewhat confident that the treatment will have positive effects.
5 = Extremely confident the treatment will have positive effects.

Subject’s rating for expected success of treatment: __________
Appendix I

Heart Rate Data Recording Sheet
Heart Rate Data Recording Sheet

<table>
<thead>
<tr>
<th>Assistant: _______</th>
<th>Date: ______________</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening:</strong></td>
<td>0:00:_____ 0:15:_____ 0:30:_____ 0:45:_____ 1:00:_____</td>
</tr>
<tr>
<td></td>
<td>1:15:_____ 1:30:_____ 1:45:_____ 2:00:_____</td>
</tr>
</tbody>
</table>

| **Baseline - BAT Trial One:** | 0:00:_____ 0:15:_____ 0:30:_____ 0:45:_____ 1:00:_____ |
|                               | 1:15:_____ 1:30:_____ 1:45:_____ 2:00:_____ 4:00:_____ |
|                               | 6:00:_____

| **Baseline - BAT Trial Two:** | 0:00:_____ 0:15:_____ 0:30:_____ 0:45:_____ 1:00:_____ |
|                              | 1:15:_____ 1:30:_____ 1:45:_____ 2:00:_____ 4:00:_____ |
|                              | 6:00:_____

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</table>
2:50: _____ 2:52: _____ 2:54: _____ 2:56: _____ 2:58: _____ 3:00: _____ 

Treatment - BAT Trial One: 0:00: _____ 0:15: _____ 0:30: _____ 0:45: _____ 
1:00: _____ 1:15: _____ 1:30: _____ 1:45: _____ 2:00: _____ 4:00: _____ 
6:00: _____ 

Treatment - BAT Trial Two: 0:00: _____ 0:15: _____ 0:30: _____ 0:45: _____ 
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6:00: _____ 

Treatment - SUDS: 0:00: _____ 0:15: _____ 0:30: _____ 0:45: _____ 
1:00: _____ 

Assistant: _______ Date: ___________ 

Posttest - BAT Trial One: 0:00: _____ 0:15: _____ 0:30: _____ 0:45: _____ 
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6:00: _____ 

Posttest - BAT Trial Two: 0:00: _____ 0:15: _____ 0:30: _____ 0:45: _____ 
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6:00: _____ 

Posttest - SUDS: 0:00: _____ 0:15: _____ 0:30: _____ 0:45: _____ 
1:00: _____
Assistant: _______  Date: ___________

Follow-up - BAT Trial One: 0:00: _____ 0:15: _____ 0:30: _____ 0:45: _____
1:00: _____ 1:15: _____ 1:30: _____ 1:45: _____ 2:00: _____ 4:00: _____
6:00: _____

Follow-up - BAT Trial Two: 0:00: _____ 0:15: _____ 0:30: _____ 0:45: _____
1:00: _____ 1:15: _____ 1:30: _____ 1:45: _____ 2:00: _____ 4:00: _____
6:00: _____

Follow-up - SUDS: 0:00: _____ 0:15: _____ 0:30: _____ 0:45: _____
1:00: _____
Appendix J

Informed Consent Document
Participation in an Investigation
Western Michigan University
Department of Psychology

Principal Investigator: C. Richard Spates, Ph.D.
Research Associate: Andrea L. Kozak, M.A.
Co-Principal Investigator: Lisa Baker, Ph.D.
Collaborating Physician: Michael R. Liepman, M.D.

I have been invited to participate in a research study called “Treatment of Specific Animal Phobias and the Relationship of an Opiate Antagonist to Outcome.” The purpose of this investigation is to study the role of physiology during the treatment of individuals with specific animal phobias. The information obtained from this investigation will be used for Andrea L. Kozak’s dissertation project.

This investigation will take place in 2046 Haenicke Hall. I will be asked to attend at least four sessions. The first, third, and fourth session will be no more than 2 hours, while the second session will be no more than 4 hours. During the first session, I will answer a screening questionnaire. I have been told to see the attached screening questionnaire that provides a list of conditions that would prohibit my participation in the study. I also will be interviewed with a structured clinical interview in order to determine whether I qualify for the study. If I do not qualify for the investigation based on the screening questionnaire and the structured clinical interview and if I believe that I need treatment for my fear of small animals, I will be given a therapist referral list. If I qualify for the study, then my heart rate will be monitored and I will answer 2 additional questionnaires, which include an evaluation of my fear response and a specific fear measure. I will also participate in a Behavioral Avoidance Test, in which I attempt to approach as close to or make contact with the animal that I fear. I will be asked to rate my phobia severity and expected success of treatment on a 1-5 scale. I will also be asked to attend an appointment with a physician collaborator on this investigation in order to have a health clearance form completed.

During the second session, I will be involved in a treatment procedure that will occur only during this session and may last a maximum of 4 hours in length. I may be administered one of two possible drugs by a research assistant. One of the drugs I might receive is naltrexone, which is an opiate blocker. This means it blocks natural pain relievers produced by the body. This drug has not been FDA approved for the purposes used in this investigation, as this is an experimental use of the drug. The other drug is a non-active placebo. I will not know which drug I will be receiving in the course of the study nor will the experimenter. For safety reasons the physician collaborator will know which drug I receive. Since the study excludes individuals for whom there are known side effects, the investigators expect no side effects from the use of either one of these drugs. If there is a side-effect, it could be nausea, a small rise in liver enzymes in the bloodstream, or inability to obtain pain relief from a narcotic pain killer for about 3-5 days after the drug is taken. The purpose of this aspect of the study is to investigate one of the drugs for its interaction on treatment outcome. Although I may be administered a
drug in the course of this study, the investigators do not expect that the drug constitutes a
treatment for my phobic condition. During the treatment procedure, a research assistant will
assist me in approaching in very small steps and touching the animal I fear. I will also participate
in a Behavioral Avoidance Test again after I complete treatment. In addition, I will rate my
phobia severity and expected success of treatment again.

During the third session, I will be interviewed again with a structured clinical interview,
and I will again answer 2 questionnaires while my heart rate is monitored. In addition, I will
participate in a Behavioral Avoidance Test again and provide ratings of phobia severity and
expected success of treatment. I will also be asked to come in for a one-month follow-up
assessment that will be exactly the same as the third session, and if I don’t receive benefit from
treatment, I will be offered another treatment session without charge after the experiment is
complete. All sessions throughout the investigation will be videotaped. Research assistants
involved in the project will have been trained by either the principal investigator or the research
associate.

As in all research, there may be unforeseen risks to the participant. If an accidental
injury occurs, appropriate emergency measures will be taken; however, no compensation or
additional treatment will be made available to participants except as otherwise stated in this
consent form. There is a possibility that I may become emotionally upset while in the presence
of the animal I fear. However, the research assistant will terminate the session and provide
crisis counseling if I become significantly upset. The research assistant is prepared to make a
referral if I need further counseling concerning my fear. If I choose to pursue further counseling,
then I will be responsible for all costs. If I get bitten by the animal, the research assistant will
provide immediate first aid and referral to emergency medical personnel for further evaluation. I
will be responsible for medical costs pertaining to this evaluation.

There is a possibility that I might gain the benefit of being rendered free of my phobia as
a result of treatment. In addition, data collected during my participation will add to the
knowledge of treating small animal phobias.

All the information collected throughout the study will remain confidential and in a
locked cabinet in the research laboratory. My name will not appear on any of the data. The
data collection forms will be coded with a number, and the investigators will keep a separate
master list with the names of the participants and the corresponding code number in a separate
locked cabinet. After all of the data have been collected and analyzed, the master list will be
destroyed. The confidential data will be kept for a minimum of five years.

I may choose not to participate or withdraw from the study at any time without
prejudice, penalty, or risk of any loss of service I would otherwise have. If at any time I have
questions or concerns related to this study, I may contact Andrea Kozak or Dr. Richard Spates
at 387-4332. I may also contact the Chair, Human Subjects Institutional Review Board (387-
8293) or the Vice President for Research (387-8298) if questions or problems arise during the
course of the study.

This consent document has been approved for use for one year by the Human Subjects
Institutional Review Board (HSIRB) as indicated by the stamped date and signature of the
board chair in the upper right corner. Participants should not sign this document if the corner does not show a stamped date and signature.

My signature below indicates that I have read and/or had explained to me the purpose and requirements of the investigation and that I agree to participate.

____________________________________  ______________________
Signature                                      Date

Consent obtained by: __________________________  ______________________
  * Initials of Research Assistant          Date
Screening Questionnaire

Participant Number: __________ Date: ____________ Assistant: __________

1. What is your age? __________

2. What specific small animal fear are you seeking treatment for (circle one)?
   - Snake
   - Spider
   - Rat
   - Mouse

3. Have you had this fear for over 6 months? Yes No
   If yes, how long? __________

4. Have you ever had a history of the following conditions:
   - Liver disease Yes No
   - Kidney disease Yes No
   - Heart disease Yes No
   - Lung disease Yes No
   - Recurring chest pain Yes No
   - Stroke Yes No
   - Neurological problem Yes No

5. Are you currently experiencing (within the last 30 days) the following conditions:
   - Ulcer Yes No
   - Migraine Yes No

6. Are you diabetic? Yes No
   If yes, do you have an adverse reaction when consuming sugar? Yes No

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7. For females only: since participation in this study involves the possible administration of one of two different drugs, we are attempting to prevent in utero exposure by asking the next few questions that follow.

a. Are you able to have children? Yes No
   If no, please explain:

b. Are you pregnant? Yes No

c. Are you using birth control? Yes No
   Is yes, what type? Pill Injections
   Other-Please name and explain:

8. Are you nursing a child? Yes No

9. Are you taking any of the following medications:
   Antabuse Yes No
   Lithium Yes No
   Tricyclic Antidepressant (Elavil, Etrafon, Limbitrol, Norpramin, Sinequan, Surmontil, Triavil, or Vivactil) Yes No
   Thioridazine Yes No

10. Are you taking any other medications? Yes No
    If yes, please list medication name, dosage amount, and length of time taking each medication:

11. Are any of the above medications taken for your phobic condition? Yes No
    If yes, are they working?
12. Are you currently receiving treatment specifically for your phobic condition?  
   Yes  No

   If yes, please specify information about what the treatment entails:

13. Are you available for at least 4 sessions (1st, 3rd, and 4th session will be no longer than 2 hours; 2nd session will be no longer than 3 hours) over the next year?  Yes  No

14. Do you want to get rid of your animal fear?  Yes  No

15. If yes, are you willing and prepared to tolerate some anxiety during treatment?  Yes  No

16. Are you currently receiving any benefits (i.e., insurance compensation, threat of a legal claim, etc.) due to your phobia?  Yes  No

17. Do you foresee any negative consequences occurring if your phobia is successfully treated?  Yes  No
Appendix K

Referral Information
Programs that provide individual and group treatment for anxiety related problems:

- Western Michigan University Psychology Clinic
  1000 Oakland Drive
  Kalamazoo, MI 49008
  (616) 387-8302

- Western Michigan University Counseling and Testing Center (students only)
  2513 Faunce Student Services Building
  Kalamazoo, MI 49008
  (616) 387-1850

- Delano Outpatient Clinic
  1722 Shaffer Street
  Kalamazoo, MI 49001
  (616) 226-5600

- Pine Rest Christian Mental Health Services
  1530 Nichols
  Kalamazoo, MI 49006
  (616) 343-6700

- Behavioral Health Resources
  3630 Capital Avenue SW
  Battle Creek, MI 49015
  (800) 269-5870
Appendix L

Medication Checklist
Participant Number: ___________________________ Date: __________________

Medication Checklist

Did the participant swallow the medication? _______ Yes  _______ No

Time the participant swallowed the medication: ____________

________________________________________
Signature of the Research Assistant
Appendix M

Treatment Session Data Form
Snake Treatment Session Data Form

Participant Number: Date: Assistant:

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Start Time: End Time: Total Duration:
Appendix N

BAT Observation Form – Follow-up Session
Observation Form for Behavioral Avoidance Test (BAT)

**Duration Measure:** Time in seconds from beginning of the BAT until the SUDS.

Total Trial One: ____________  Total Trial Two: ____________
Contact time: ____________    Contact time: ____________

**Distance Measure:** Number on last fully passed mark or on BAT criteria.

Trial One: ____________  Trial Two: ____________

**SUDS:** Rating given by the participant following the assistant’s final verbal prompt.

Trial One: ____________  Trial Two: ____________

Baseline Level (Step ) SUDS: ____________

**Overt Responses—Check all that apply:**

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<td>Turning Away/Not looking</td>
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<td>Other (____________)</td>
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**Comments:** The subject’s response to the BAT and level of severity:

________________________________________________________

-Please continue on back-

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Assistant’s and Subject’s rating of phobia severity:

Please rate the severity of your phobia symptoms according to the following scale:

1 = Symptom free and not disabling.
2 = Slightly severe and disabling.
3 = Moderately severe and disabling.
4 = Excessively severe and disabling.
5 = Extremely severe and disabling.

Assistant’s rating for severity of phobia: _________ (rate prior to asking for the subject’s rating)

Subject’s rating for phobia severity: _________

Subject’s rating of expected success of treatment:

Having now been given the explanation for the treatment (Having now received the treatment), please express your current level of confidence regarding the treatment outcome:

1 = Extremely skeptical that the treatment will have positive effects.
2 = Somewhat skeptical that the treatment will have positive effects.
3 = Withholding judgment; equally confident and skeptical.
4 = Somewhat confident that the treatment will have positive effects.
5 = Extremely confident the treatment will have positive effects.

Subject’s rating for expected success of treatment: _________

Participant would like to schedule another treatment session: Yes No
Appendix O

Debriefing Information
As you are aware, you agreed to participate in an investigation entitled the "Treatment of Specific Animal Phobias and the Relationship of an Opiate Antagonist to Outcome." The data collection has now been completed. This summary is intended to supply you with a clear understanding of the essential hypotheses and outcomes of the research.

Previous research had shown that the psychological treatment used in this study is effective in eliminating symptoms of phobic avoidance with respect to animals. In our own investigation of the treatment we have found that it works both rapidly and nearly completely in reducing symptoms of animal phobias. In the study in which you participated we were interested in developing a better understanding of how the treatment works. Our hypothesis was that a physiological process, in addition to a well-understood psychological process, may account for its effectiveness. Specifically, it was our belief that naturally produced chemicals in the body’s central nervous system were released during the process of a participant’s confrontation with the feared animal. This central nervous system chemical is believed to produce a calming reaction, which we believe assisted the psychological process of affecting the cure. In the present study, a drug was given which is believed to counteract the effect of this calming agent released in the central nervous system. Therefore, one expected effect of the drug might have been to reduce the effect of the psychological treatment for those people to whom it was administered. This study was designed to determine if this hypothesis was indeed correct. Our analysis of the data shows that while the primary intervention was effective across conditions, there were no significant differences between the groups on any dependent measures, which suggests a reduced role if any of the endogenous opiate system in explaining the effects of this treatment protocol.

For those who received the drug and for whom the psychological treatment did not work, they have been offered treatment without the drug. We’d like to thank you for your participation.
Appendix P

Demographic Characteristics of the Study Sample
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Appendix Q

Behavioral Data for Completers and Non-Completers
The amount of time in seconds participants were in contact with the feared animal during the BAT for all groups combined.

Steps 0–13 refer to lines on a large ruler that were approximately 12 inches apart in length. Steps 14–18 refer to different aspects of touching the cage where the feared animal was located. Steps 19–30 refer to various amounts of time in seconds the participants were in physical contact with the feared animal (i.e., step 19 = 0–4 seconds of non-continuous contact).
The anxiety level during the maximum step participants completed during the BAT for all groups combined.

The FSS Specific Animal Item score for all groups combined.
The SPQ total score for all groups combined.

The Preoccupation Subscale score of the SPQ for all groups combined.
The Avoidance Subscale score of the SPQ for all groups combined.

The Cognitive-Behavioral Subscale score of the SPQ for all groups combined.
The anxiety level during the maximum step participants completed during the BAT for all groups combined.

The anxiety level during the maximum step participants completed during the BAT for all groups combined.
Appendix R

Behavioral Data for Completers and Non-Completers Displayed by Group
The amount of time in seconds participants were in contact with the feared animal during the posttest session BAT displayed by group.

Steps 0-13 refer to lines on a large ruler that were approximately 12 inches apart in length. Steps 14-18 refer to different aspects of touching the cage where the feared animal was located. Steps 19-30 refer to various amounts of time in seconds the participants were in physical contact with the feared animal (i.e., step 19 = 0-4 seconds of non-continuous contact).
The anxiety level during the maximum step participants completed during the posttest session BAT displayed by group.

The FSS Specific Animal Item score during the posttest session displayed by group.

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The SPQ total score during the posttest session displayed by group.

The Preoccupation Subscale of the SPQ during the posttest session displayed by group.

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The Avoidance Subscale of the SPQ during the posttest session displayed by group.

The Cognitive-Behavioral Subscale of the SPQ during the posttest session displayed by group.
The anxiety level during the maximum step participants completed during the treatment session BAT displayed by group.

The anxiety level during the maximum step participants completed during the follow-up session BAT displayed by group.
Appendix S

Means and Standard Deviations – Behavioral Data
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Appendix T

All Data for All Sessions Displayed by Group
BAT Contact – Naltrexone Group.

BAT Contact – Placebo Group.
BAT Contact – Standard Treatment Group.

BAT Steps – Naltrexone Group.

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BAT Steps – Placebo Group.

BAT Steps – Standard Treatment Group.
Maximum Stopping Point SUDS during the BAT – Naltrexone Group.

Maximum Stopping Point SUDS during the BAT – Placebo Group.

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Maximum Stopping Point SUDS during the BAT – Standard Treatment Group.

Baseline Stopping Point SUDS during the BAT – Naltrexone Group.
Baseline Stopping Point SUDS during the BAT – Placebo Group.

Baseline Stopping Point SUDS during the BAT – Standard Treatment Group.

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Overt Responses during the BAT — Naltrexone Group.

Overt Responses during the BAT — Placebo Group.
Overt Responses during the BAT – Standard Treatment Group.

Therapist Rating of Participant Phobia Severity – Naltrexone Group.
Therapist Rating of Participant Phobia Severity – Placebo Group.

Therapist Rating of Participant Phobia Severity – Standard Treatment Group.
Participant Rating of Phobia Severity – Naltrexone Group.

Participant Rating of Phobia Severity – Placebo Group.
Participant Rating of Phobia Severity – Standard Treatment Group.

Expected Success of Treatment Scale – Naltrexone Group.
Expected Success of Treatment Scale – Placebo Group.

Expected Success of Treatment Scale – Standard Treatment Group.

140
Spider Phobia Questionnaire Total Score – Naltrexone Group.

Spider Phobia Questionnaire Total Score – Placebo Group.

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Spider Phobia Questionnaire Total Score – Standard Treatment Group.

Fear Survey Schedule Composite Score – Naltrexone Group.
Fear Survey Schedule Composite Score – Placebo Group.

Fear Survey Schedule Composite Score – Standard Treatment Group.
Heart Rate During Treatment – Naltrexone Group.

Heart Rate During Treatment – Placebo Group.
Heart Rate During Treatment – Standard Treatment Group.

Heart Rate During BAT – Naltrexone Group.
Heart Rate During BAT – Placebo Group.

Heart Rate During BAT – Standard Treatment Group.

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Appendix U

Means and Standard Deviations – All Data
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Appendix V

Behavioral Data for Baseline and Treatment Sessions Displayed by Group
Figure V1. BAT Contact – Naltrexone Group.

Figure V2. BAT Contact – Placebo Group.
Figure V3. BAT Contact – Standard Treatment Group.

Figure V4. BAT Steps – Naltrexone Group.
Figure V5. BAT Steps – Placebo Group.

Figure V6. BAT Steps – Standard Treatment Group.
Figure V7. Maximum Stopping Point SUDS during the BAT – Naltrexone Group.

Figure V8. Maximum Stopping Point SUDS during the BAT – Placebo Group.
Figure V9. Maximum Stopping Point SUDS during the BAT – Standard Treatment Group.

Figure V10. Baseline Stopping Point SUDS during the BAT – Naltrexone Group.
Figure V11. Baseline Stopping Point SUDS during the BAT – Placebo Group.

Figure V12. Baseline Stopping Point SUDS during the BAT – Standard Treatment Group.
Figure V13. Overt Responses during the BAT – Naltrexone Group.

Figure V14. Overt Responses during the BAT – Placebo Group.

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Figure V15. Overt Responses during the BAT – Standard Treatment Group.

Figure V16. Therapist Rating of Participant Phobia Severity – Naltrexone Group.
Figure V17. Therapist Rating of Participant Phobia Severity – Placebo Group.

Figure V18. Therapist Rating of Participant Phobia Severity – Standard Treatment Group.

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Figure V19. Participant Rating of Phobia Severity – Naltrexone Group.

Figure V20. Participant Rating of Phobia Severity – Placebo Group.
Figure V21. Participant Rating of Phobia Severity – Standard Treatment Group.

Figure V22. Expected Success of Treatment Scale – Naltrexone Group.
Figure V23. Expected Success of Treatment Scale – Placebo Group.

Figure V24. Expected Success of Treatment Scale – Standard Treatment Group.
Appendix W

HSIRB and IACUC Approval Letters
Date: 21 June 2000

To: C. Richard Spates, Principal Investigator
   Lisa Baker, Co-Principal Investigator
   Andrea Kozak, Student Investigator for dissertation

From: Sylvia Culp, Chair

Re: HSIRB Project Number 00-02-03

This letter will serve as confirmation that your research project entitled “Treatment of Specific Animal Phobias and the Relationship of an Opiate Antagonist to Outcome” has been approved under the full category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note that you may only conduct this research exactly in the form it was approved. You must seek specific board approval for any changes in this project. You must also seek reapproval if the project extends beyond the termination date noted below. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: 21 June 2001
Date: 2-1-01

To: Bruce E. Bejcek, Ph.D.

From: C. Richard Spates, Ph.D.
Andrea L. Kozak, M.A.

Re: Amendment to IACUC Protocol No. 09-02-01

This memo serves to notify the Institutional Animal Care and Use Committee that three animals approved for use under IACUC Protocol No. 99-02-01 (HSIRB Project Number 99-02-09, Ellen Koch’s dissertation) will be used for HSIRB Project Number 00-02-03 (Andrea Kozak’s dissertation). These animals include the following species: the corn snake, C3H mouse, and Long Evans rat. The same procedures utilized under approved IACUC Protocol No. 99-02-01 for Ellen Koch’s dissertation (HSIRB Project Number 99-02-09) will be used for Andrea Kozak’s dissertation (HSIRB Project Number 00-02-03). Data collection for Ellen Koch’s dissertation study will continue during the time Andrea Kozak’s dissertation study begins. This means that in addition to data collection for Ellen Koch’s study, the above mentioned animals will be used approximately 180 more times.
Date: November 6, 2002

To: C. Richard Spates, Principal Investigator
Andrea Kozak, Student Investigator

From: Robert Eversole, Chair

Re: IACUC Protocol No. 02-09-02

Your protocol entitled “Treatment of Specific Animal Phobias and the Relationship of an Opiate Antagonist to Outcome” has received approval from the Institutional Animal Care and Use Committee. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: October 9, 2002
REFERENCES


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