

AN ABSTRACT OF THE THESIS OF

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The phenomenon of phantom limb pain has been well documented for centuries, but little clinical work has been done to alleviate it. Physician and neuroscientist Vilayanur S. Ramachandran began researching this condition nearly two decades ago, and has discovered a promising alternative treatment: mirror-box therapy. This therapy is not yet widely accepted by the scientific and medical communities because there is insufficient data explaining *how* and *why* it works. This study analyzes Ramachandran's rhetoric promoting the therapy. Scott Stroud's melioristic method is applied to Ramachandran's scientific and popular publications. The purpose is to determine whether or not his rhetoric is melioristic in that it promotes positive, and thus, pragmatic changes. This thesis indicates the important insights pragmatism can yield when utilized in acts of rhetorical criticism.

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Pragmatism and Pain: the Melioristic Rhetoric of Mirror Box Therapy

by
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I understand that my thesis will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my thesis to any reader upon request.

Anna F.B. Thompson, Author

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CHAPTER I: INTRODUCTION

The current state of neurology is an exciting one: we are now learning more about ourselves and the way our brains work than we ever have before. The implications of this new knowledge does, however, present some challenges. In one way, these innovations represent major breakthroughs and previously unrealized possibilities. In another, there is overall resistance when these novelties defy traditional protocols and requirements. The fact that the scientific and medical communities rail against unproven methods and unexplainable “cures” is not surprising, given the fact that they prefer instead a slow process of trial and experiment and observation. As a result, any change in the status quo may be expected to endure this same long and complicated process.

This thesis will focus on one such novelty, mirror-box therapy (MBT), developed and promoted by physician and neuroscientists Vilayanur S. Ramachandran as a method for treating phantom limb pain (PLP). The wonderful thing about this therapy is that it appears to work for the majority of individuals who try it. The mysterious part is that no one, not even Ramachandran, knows why, and so far modern science has failed to explain its “effectiveness.” The fact that this therapy exceeds the boundaries of scientific and medical knowledge helps to explain why it has not yet gained acceptance into those generally rigid communities. It is this obscure nature and lack of arrant acceptance that points to my artifact: Ramachandran’s rhetoric promoting his revolutionary therapy, abundant in both scientific and popular publications. In light of this artifact and its unique nature, I have chosen a new method for rhetorical criticism that is just a novel and just as promising. This method attempts to merge the philosophies of both rhetoric and

pragmatism, hoping through that joining to decipher how our words affect *practical changes* in lived realities. The research goal of this thesis is to determine whether Ramachandran's rhetoric has been *persuasive* insofar as it yields melioristic changes in reality. If his rhetoric proves to be persuasive, then it is *pragmatic* in nature. Ramachandran's words will have directly resulted in the improvement of the lived experiences of those with PLP, and will have spurred further investigation and consideration within the scientific and medical communities. If his rhetoric is not persuasive and pragmatic, his therapy is likely to remain untested and unaccepted as a viable treatment for PLP.

I became interested in Ramachandran and his innovative research last spring when I was writing the term paper for my "Rhetoric of Early Pragmatism" seminar. This budding interest in Ramachandran coincided with an increasing belief in the value of pragmatic thought. At the time I thought it would be fascinating to analyze rhetoric pragmatically; that is to say, to judge written and spoken rhetoric by its ability to create practical and positive changes in the lived experience of others. I thought it would be even more interesting to analyze a topic as mysterious and compelling as MBT. Initially I was absorbed with the pragmatic philosophy of William James (1842-1910) as found in works such as "The Will to Believe" (1896). Unfortunately, James's work did not provide a method for analysis, and the existing rhetorical theories – most notably Lloyd Bitzer's "The Rhetorical Situation" (1968) – were only loosely tied to pragmatism. My need for a critical method was resolved by an interdisciplinary answer: philosopher and

communication scholar Scott Stroud's 2010 article "What Does Pragmatic Meliorism Mean for Rhetoric?"

At the beginning, the challenges seemed obvious. My new interest in pragmatism meant that I was just learning its intricacies, and it led me to choose to analyze the rhetoric in promotion of a unique therapy using a novel and untested rhetorical method. But I would argue that the potential benefits of my research were also evident: the small chance to move things, practically speaking, forward, while resisting those conventions that possess an aversion to change.

As noted above, the purpose of using this method is to determine whether Ramachandran's rhetoric has been persuasive by creating melioristic, thus pragmatic, changes. My hypothesis is that Ramachandran's rhetoric will be persuasive in this sense, that it will prove to have affected change in lived realities. The concept of meliorism deals with the betterment of a specific situation by the intervention of human activity. One concerned with meliorism would ask: how can a given situation be improved; how can the lived experience of individuals be enhanced? I believe that rhetoric with meliorism at its core is inherently appealing to most people. I think the overriding human tendency is to improve our lives and the lives of others, and to pursue those ideas and goals that would lead to this end. The undeniable focus of meliorism is one of improvement, and this sense is deeply disturbed by the existence of situations that are far from their "ideal" state.

The existence of PLP fits this scenario. The phenomenon has been acknowledged for nearly 400 years, and its clinical description as existed for well over one hundred

years. The painful sensations felt in the missing limb(s) cause amputees significant frustration and distress, in many cases to the point where “normal” daily life is disrupted. Today, modern pharmaceuticals are often used to treat the condition, yet they fail to do so. That fact that this condition has been known for *such* a long time, compounded by the failure of modern attempts to treat phantom pain, obscures a startling and disappointing fact: systematic examinations only really began twenty years ago when Ramachandran started to work with PLP patients. In addition, all past and current treatments have been devised without a clear understanding of what causes phantom limbs or the painful sensations. Enter here mirror-box therapy.

The literature review shows that while Ramachandran’s young therapy has amassed anecdotal successes, there is no scientific prove for how or why the therapy appears to “work.” Ramachandran himself states in his latest book, *The Tell-Tale Brain* (2011), that “no one has proven the mechanism yet” (34). We see that this enigmatic condition is matched by an equally enigmatic treatment. And we see again how the established status quo of the scientific field influences this situation. Typically, physicians and scientists seeks to understand the underlying causes and characteristics of a condition before they prescribe a specific treatment. Traditionalists would argue, how can you treat something without knowing what it is and how it exists? A physician will not prescribe an antibiotic until they are sure the patient does indeed have a bacterial infection, and until they know the specific type of infection the patient has (since that will determine the type of antibiotic administered). These traditionalists might argue that Ramachandran is, effectively, “putting the cart before the horse” by promoting a

treatment for a condition that is not yet understood. It is for this reason that Ramachandran's rhetoric is worthy of study.

Now that the scope of this study has been justified, I will explain how this thesis will proceed. This study will develop in four parts. The second chapter will feature a review of relevant literature by Ramachandran and others that pertains to MBT and the phenomenon of phantom limbs. This will include a review of academic articles from scientific publications, as well as popular essays and books that target more general readers. This review will provide the reader with the historical context needed to understand PLP and Ramachandran's research into MBT. The third chapter will be an explanation of the method of analysis that will be employed to analyze Ramachandran's rhetoric. I will discuss Stroud's article, and explain how I will apply the four methodological maxims for melioristic rhetoric to the aforementioned artifact. I will also describe some of the criticisms of the model and justify my use against them.

The fourth chapter will provide the analytical merger of artifact and method. In the first section I will lay out Ramachandran's rhetoric (the artifact) to show the timeline of his argument for research into PLP and MBT. The second section will feature the analysis itself. The purpose of the analysis is to amass enough data to determine whether or not Ramachandran's rhetoric has been melioristic and persuasive. At this juncture I should note one critical point: the rhetoric that is being analyzed is, at base, Ramachandran's. On several occasions he has published academic and popular works with varying coauthors, and by tradition these coauthors are given a bi-line on the finished piece. I must also operate within conventional standards, and, when I refer to

these dual-author publications, I include the accompanying author as well as Ramachandran. Even so, in all of these coauthored works Ramachandran tends to speak in the first person, and it is important to remember that he is the lead researcher and writer. This is not to say that his coauthors are not important additions to the overall work. It is just simply to clarify the context for Ramachandran's rhetoric.

The fifth and final chapter will discuss the conclusions that can be drawn from the analysis and results. Based on these results I will provide an answer to my research question, and this answer will indicate the degree to which my hypothesis proved true. I will examine the strengths and weaknesses of Ramachandran's approach. I will also discuss the limitations and benefits present in this study, in terms of both Stroud's method and my analysis. I will end by noting some avenues for future research. It is my hope, regardless of the outcome of the analysis, that this study will set the stage for further examinations of MBT and application's of Stroud's method for rhetorical criticism.

Modern science and medicine is far more advanced than ever before, yet the very presence of PLP continues to defy explanation. The use of MBT to treat PLP exists beyond the traditional boundaries of what these communities consider sufficient effectiveness and "proof." Thus, Ramachandran's rhetoric is the link that connects the two and carries forward the conversation. If his argument proves to be persuasive, the potential impact on the lived experience of many could be positive. For some this topic is more than just theoretical; it is an intimate reality that has the chance of being radically and beneficially altered.

CHAPTER II: REVIEW OF LITERATURE

The phenomenon of PLP has been in existence for centuries. Cases of this condition were reported in massive numbers during the American Civil War (1861-1865). This drew the attention of scientist, psychologist, and philosopher William James, who devoted an essay to the topic. Since that time, the British and American medical communities have sought information regarding the causes of and effective treatments for it. Today we still understand relatively little about PLP, but recent scientific and medical advances have been made that indicate why it may occur and, as a result, how it may be eliminated. A therapy that has been in the works for roughly 20 years has been gaining attention recently for its anecdotal successes in treating PLP. This treatment, MBT, may be effective for treating pain. But its efficacy has not yet been proven per the standard medical and scientific criterion for effectiveness.

In order to understand the concept of the therapy, one must first understand what PLP is and how it has traditionally been explained and approached. This review will consist of three main parts: the first section will offer a history of phantom sensations and pain, and will analyze the conventional responses of the medical communities, therapists, and patients to these issues. The second section will discuss literature that provides a history of past PLP theories and treatments. The third and final section will discuss the emergence of mirror-box therapy as an alternative treatment for PLP. This section will give a background of the therapy's creator (Ramachandran), how the therapy is administered, and early results of the treatment. Most importantly, this piece will consider the role that rhetoric continues to play in conveying the "effectiveness" of a

treatment that moves beyond the traditional definitions and classifications of modern medicine. For this reason, a rhetorical analysis of Ramachandran's attempts to popularize the therapy becomes warranted.

History of Phantom Limb Pain

According to an article published in *Proceedings: Biological Sciences*, the “neurological term ‘phantom limb’ alludes to the complex of rich and vivid perceptions that are referred to an amputated body part” (Aglioti et al. 273). The phenomenon of PLP is not new; as noted previously it has been heavily documented since the Civil War. As B. Bower writes, “for more than 100 years, physicians have published accounts of people who perceive an amputated arm or leg as if it were still there” (357). That said, humans have experienced and grappled with this phenomenon as long as we have existed. Ramachandran is professor of psychology and neurosciences at the Center for Brain and Cognition at the University of California, San Diego. In his article, “Consciousness and Body Image: Lessons from Phantom Limbs, Capgas Syndrome and Pain Asymbolia,” Ramachandran writes that “phantom limbs have probably been known since antiquity; not surprisingly there is an elaborate folklore surrounding them” (1851).

The first documented account of PLP actually occurred centuries before the 1800s. According to an article that appeared in the *British Medical Journal (BMJ)*, the “great French military surgeon Ambroise Pare (1510-1590) is credited with the first description, in 1551, of the phenomenon of phantom limb” (“Phantom” 1588). This information initially appears to conflict with another article entitled “Synaesthesia in Phantom Limbs Induced with Mirrors” by Ramachandran and D. Rogers-Ramachandran.

The authors write that Silas Weir-Mitchell (1829-1914) was the first to describe “phantom limbs,” and that interest in this topic and his studies have since evoked “considerable interest and there have been literally hundreds of clinical case studies” (377). In their article for *National Public Radio*, Robert Krulwich and Jad Abumrad (of the same Brain and Cognition Center as Ramachandran) clarify the Pare/Weir-Mitchell distinction. While Pare was believed to be the “first to describe the sensation,” Weir-Mitchell, “another great military surgeon, coined the term ‘phantom limb’” in 1872 (Krulwich & Abumrad).

This history notwithstanding, the actual study of the phenomenon of phantom limbs is still in its infancy. In his 1998 article, Ramachandran writes that although there have been hundreds of case studies since Weir-Mitchell’s time, “systematic experimental work on them began only ten years ago” (“Consciousness” 1852). We are thus just over twenty years into the standardized modern study of a phenomenon that has been experienced and reported for over four hundred years. This is not to suggest that earlier attempts to study PLP do not exist. In 1887, William James published “The Consciousness of Phantom Limbs.” He explains his acquaintance with Weir-Mitchell’s work, and writes that the occurrence of phantom limb is “so well known, and the material for study so abundant, that it seems strange that no more systematic effort to investigate the phenomenon should have been made” (204). James conducted his own study focused on phantom limbs using interviews and questionnaires to gather data from 185 amputee participants. In analyzing the responses, he explains that the sensations felt in the lost limbs vary “from acute pain, pricking, itching, burning, cramp, uneasiness, numbness,

etc” (205). James also notes that the hand and foot are most likely to be felt as phantoms, and not the arm or leg in-between (205). He concludes that neither the condition of the stump nor the location of the amputation are absolute determining factors of whether phantom sensation are felt or whether some of those sensations are painful (207). The question remained, for James and others, as to why the sensations occurred. The parallel question of how to *eliminate* the sensations and pain remained as well.

Discussion emanating from more recent study of PLP remains no less conjectural. Those involved with the British and American medical communities theorized about what was causing or exacerbating phantom limbs, as well as ways to treat the condition. In a 1978 article published in the *BMJ*, the author concedes that that “the cause of phantom limb pain is unknown” (“Phantom” 1588); however theories and assumptions abound. According to Ramachandran and Sandra Blakeslee in *Phantoms in the Brain*, during the mid-1980s the *Canadian Journal of Psychiatry* published an article in which the authors argued that phantom limbs “are merely the result of wishful thinking ... the patient desperately wants his arm back and therefore experiences a phantom” (23). Ramachandran and Blakeslee note a more popular theory, one in which the “frayed and curled up nerve endings (neuromas) in the stump that originally supplied the hand tend to become inflamed and irritated,” thereby fooling the brain into thinking the limb is still there (23). The authors explain that this is “utter nonsense,” but that it is “a simple and convenient explanation” to which most physicians still cling (23). Some research looked at other factors, and in the late 1990s, authors K. Fisher and R.S. Hanspal found that there is no connection between the experience of PLP and emotional distress, “suggesting that

phantom pain is not a function of emotional adjustment” (904). A recent article found through the *National Institute of Neurological Disorders and Stroke* explains that previous thinking believed sensations of PLP to be attributed to “irritation of nerves located near the limb stump” and that “brain cells affected by amputation simply died off” (“Pain: Hope”). From the beginning the phenomenon has been well-documented and observed, but the cause itself still presents a debate today.

Current thinking indicates that phantom limbs and concurrent pain are the result of a *confused brain*. The arm and hand may be removed, but as far as the brain is concerned, they are still present. In his March 2011 article for *Time* magazine, John Cloud explains that the frontal lobe (which commands motor functions) “doesn’t register that a limb is gone” and “consequently, it keeps sending nerve signals down the spine to the appendage” (88). Because the hand or foot is not there to send a response back to the brain, the brain “responds by sending ‘pay attention to me’ signals,” and these signals are sometimes interpreted as pain in the missing limb (88). In his latest book, *The Tell-Tale Brain: A Neuroscientist’s Quest for What Makes Us Human* (2012), Ramachandran explains this theory in a bit more detail. He discusses a patient named Victor who is missing his left arm below the elbow. After determining that Victor was neurologically and mentally sound, Ramachandran blindfolded him and “started touching various parts of his body with a Q-tip, asking him to report what he felt, and where” (52). All of Victor’s responses to this initial test were normal until Ramachandran touched the left side of his face, to which Victor said, “Doctor, I feel that on my phantom hand. You’re touching my thumb” (52).

By repeating the procedure Ramachandran eventually discovered that an entire map of Victor's left hand was now represented (by Victor's brain) on the left side of his face (52). This discovery benefitted both suffering patient and experimenting physician: now if Victor feels his palm itching, "a frequent occurrence that used to drive him crazy – he says he can now relieve it by scratching the corresponding location on his face" (53). Ramachandran benefitted by the realization of the brain's map of the body may be the cause of phantom sensations. He explains that when an arm is amputated, "there is no longer an arm, but there is still a *map* of the arm in the brain," and that "the brain map, having nothing better to do, soldiers on" (53). Ramachandran writes that this brain map will keep representing that arm or leg "second by second, day after day" and that this "map persistence" gives a basic explanation as to the occurrence of phantom limbs (53).

The mysterious part is that some amputees experience movement in their phantoms, while others experience paralysis. Ramachandran believes that some feel the sensation of movement (willed or not) because "the motor command centers in the front of the brain don't 'know' the arm is gone – they are on autopilot – so they continue to send motor command signals to the missing arm" (57). He explains that a non-amputee will not experience this by imagining moving their hand because there is too much other feedback coming from the skin, muscles, joints, etc telling the brain that the hand is *not* moving (57-8). A missing arm cannot send back these contradictory signals, and therefore the amputee experiences "actual movement sensations" (58).

Many patients, however, report the exact opposite: that their phantom limb is paralyzed; for some, "the phantom is twisted into an awkward, extremely painful

position” (58). This puzzled Ramachandran greatly at first, because he presumed the sensory-motor connections in the patients’ brains were the same as before the amputation (58). The clue that linked the patients with paralyzed phantoms was that they had all experienced real paralysis of their limb prior to amputation; peripheral nerve injury had been caused by some violent event (58). In this case the “entire feedback loop had gone dead,” and the brain began “learning” paralysis (58). Ramachandran writes that the fact that “experience modifies the brain by strengthening or weakening synapses that link neurons together” is well-established, and that this modification process is called *learning* (58). When the paralyzed limb was physically amputated, the “learned paralysis got carried over into the phantom so the phantom felt paralyzed” (59).

In their earlier book *Phantoms in the Brain* (1998) Ramachandran and Blakeslee argue that “movements and paralysis of phantom limbs are hard enough to explain, but even more puzzling is the agonizing pain that many patients experience in the phantom soon after amputation” (50). They explain that this pain could be caused by neuromas (the frayed nerve endings at the site of the amputation), but that surgical removal of these often does not eliminate PLP (50). The authors write that the pain could be the result in part due to the brain’s remapping; a “tiny glitch” in the process could mean an error in what the pain centers are hooked up to (50). Ramachandran and Blakeslee explain that remapping could result in pain for two other reasons. First, due to remapping, amputees may no longer have the “volume control” to dampen down pain, and they may experience “an echolike ‘wha wha’ reverberation and amplification of pain” (51). Second, because remapping is inherently abnormal (especially on a large scale such as a full or partial

limb), it “is possible that the touch synapses are not quite correctly rewired and their activity could be chaotic” (51). The “higher brain centers” may then interpret the “chaotic input as junk, which is perceived as pain” (51). A final theory regarding PLP is that “some patients say the pain they felt in their limbs immediately prior to amputation persists as a kind of pain memory” (51). Soldiers who lost their hands to grenades report the sensation that their phantom is in a “fixed position, clenching the grenade, ready to toss it. The pain in the hand is excruciating – the same they felt the instant the grenade exploded, seared permanently into their brains” (51). Regardless of the cause, and whether or not it is related to phantom limbs, Ramachandran and his coauthor conceded that “pain is one of the most poorly understood of all sensory experiences” (52).

The occurrence of phantom limbs and concurrent pain impacts a considerable number (arguably the majority) of amputees, both historically and today. As Wilcher et al. write in their 2001 case report, there are “over 130,000 limb amputations in the US each year.” The authors explain that nearly all amputees experience some form of phantom limb effect, and that “a significant percentage of patients ... may also experience phantom limb pain” (Wilcher et al.). Two notes in the *BMJ* show this was true sixty years ago; A. Sliosberg reports that according to French statistics at the time “72.5% of all amputees complain of pains, most of them being phantom pains” (1109). J.D. Craig writes initially that “phantom sensations are of almost universal occurrence after amputation,” but that “actual pain is comparatively rare” (904). After a brief discussion on the matter Craig amends his previous statement, saying that “it may therefore be that phantom pain is very much more common than generally believed” (904). Lorimer

Moseley writes for the *Scientific American* that PLP is indeed common, and notes that 40 to 80 percent of amputees experience this painful sensation. While this is a broad range, it means that annually roughly 52,000 to 104,000 Americans begin experiencing the torment of PLP.

One person suffering from such sensations and pain is Don Goodman; Goodman is featured in Cloud's *Time* article. In 2000, Goodman lost his arm to an alligator (Cloud 80). Moments after the event, Goodman says he "could feel every finger of the hand that had served me for 59 years and which now lay in the belly of an alligator 200 yards away... and they all hurt!" (80). Ever since that time, Goodman has endured what Cloud calls the "particular agony" of PLP. He described his pain to Cloud in this manner: "It's a sensation of pressure, as if I had my right hand in a steel glove that's one size too small. And then that's overlaid by the type of tingling you get when a limb falls asleep – multiplied by about ten" (80). Goodman is prescribed five milligrams of methadone daily, but usually that is not enough, and "if he's idle, it's virtually all he thinks about" (80).

Veterans returning from the wars in Iraq and Afghanistan represent a surge in amputees. According to the report "U.S. Military Casualty Statistics: Operation New Dawn, Operation Iraqi Freedom, and Operation Enduring Freedom" issued by the *Congressional Research Service*, as of 28 September 2010, there were 1,621 amputees as a result of the wars (Fisher 4). The majority of amputations in all conflicts were "major limb" (arm or leg) as opposed to "partial limb" (hands/fingers and feet/toes) (Fisher 3). The number of amputations due to the wars has grown by over 1,100 since the number of

amputee veterans reached 500 in January of 2007 (Weisskopf). Weisskopf explains that many of these injuries and resulting amputations are caused by roadside explosives, and that the high survival rate of soldiers in these conflicts (nine in ten versus 7.5 in ten during the Vietnam War) makes it clear why so many servicemen and women sustain “severe and lasting disabilities, including loss of limbs.”

Many thousands of amputations occur each year, some the result of modern wars, the majority the result of other accidents, conditions, and illnesses. The PLP that accompanies the majority of these amputations often has a disastrous effect on the amputee’s quality of life. The coming section will look at previous treatments for this condition. Past successes in this matter have *not* been many, and the quest to answer the question “how can we eliminate phantom pain?” persists for this reason.

History of Past Phantom Limb Pain Treatments

In veteran and civilian amputees alike, PLP is a frustrating phenomenon that can make life barely tolerable. As Ramachandran and Blakeslee write in *Phantoms*, the pain can be so excruciating that some individuals with PLP contemplate suicide (22). Today there are more treatments, pharmacological and otherwise, available to persons suffering from *any* type of pain. But the medical jury is still out on how to best treat PLP. This has been the case since the beginning. Over the years there have been various treatments devised in an attempt to battle phantom limb sensations and pain. At least since the mid-1800s when Civil War veterans “complained that they were disturbed by ‘sensory ghosts,’” the medical community has tried different ways to help amputees manage their PLP (Cloud 88). Wilcher et al. explain as others have that “PLP is not yet well-

understood,” and that “various types of treatments for PLP have been attempted, the outcomes of which have been largely disappointing.” In his foreword for Ramachandran and Blakeslee’s *Phantoms*, physician Oliver Sacks writes that in the attempt to eliminate PLP, “physicians and their patients have been driven to extreme and desperate measures” (vii). These measures include “making the amputation stump shorter and shorter, cutting pain or sensory tracts in the spinal cord,” and “destroying pain centers in the brain itself” (vii). Sacks notes that usually “none of these work,” and that the phantom sensations and pain “almost invariably return” (vii). Some patients were told by their physicians that the phantom sensations and pains were all in their head (Berger & Bacon). The irony here is that phantoms may prove to be “all in the patient’s head” if it is shown that brain remapping is indeed the cause of PLP. However, past and current treatments (physically altering or manipulating the stump, cutting sensory tracts, etc) largely have *not* been based on this idea.

Several articles in the *BMJ* from the late 1940s give us insight into how PLP was treated just 70 years ago. Hugh Carleton describes a method of treatment by manually over-stimulating the stump with the goal of unlocking the impulses of the thalamus (1052). Carleton believes in the efficacy of this method, and that when it comes to PLP, the amputee must “not nurse and protect, but hit!” their stump (1052). Sliosberg explains a method he has used since the late 1930s; he writes that “such pains are greatly relieved with a parenteral thiamine in a very high proportion of cases,” and that if this fails, one may perform a “sympathetic ganglia ‘Novocain’ block or a periarterial injection of Novocain” (1109). In that same issue, Leon Gillis writes that “an artificial limb is often a

comfort to the patient with a phantom pain, and tight bandaging at night, when his phantom pain becomes aggravated, relieves this pain” (1108).

Cloud laments that until only recently “few treatments other than great gobs of opiates existed for phantom limb pain” (88). Other alternative therapies that do *not* include the use of pharmaceuticals often are not applicable to individuals suffering from PLP. For instance, massage and acupuncture are attractive options for those experiencing other forms of chronic pain. However, the amputee is at an obvious disadvantage: as Cloud notes, how do you massage or needle a limb that isn’t there? (86). For many amputees the resulting options may appear slim, and prescription drugs may seem to be the most optimal choice. However, use of such drugs can have serious drawbacks. The body can only process so many milligrams of highly-narcotic medication for so long; long-term use can lead to increased tolerance and increased dosages, damage to the liver and other organs, and possibly addiction. Dr. Josephine Briggs, director of the National Center for Complementary and Alternative Medicine at the National Institutes of Health, is quoted by Cloud as explaining the downsides of opioid use. She says that “they make people sleepy. They impair mentation. They’re constipating. They deaden life in a lot of ways” (82).

Even less dangerous and regulated drugs such as Tylenol and Advil can present a risk if taken in large amounts or over a long period of time. Acetaminophen (such as Tylenol) in high-dosages is “the leading cause of liver failure,” and ibuprofen (such as Advil) and other anti-inflammatories “can literally burn a hole in your stomach” (Cloud 82). In the end, the type or amount of drug does not really matter; most amputees do not

experience relief from pharmaceuticals. In their study focusing on MBT, Standiford Helm II and Melissa Stoppler report that when using traditional techniques (including prescription drugs), only approximately ten to twelve percent of patients experienced any relief from their phantom pain. Moseley confirms this when he writes that PLP is “generally very nasty” and “usually untouched by drugs.”

One individual who was featured in the study by Wilcher et al. rated his daily pain between eight and ten on a scale of one to ten, and reported that episodes lasted between fifteen minutes and an hour and a half. At the time of the study the male patient was 24 years old, and was missing his entire left arm and shoulder (Wilcher et al.). The authors describe the dizzying array of drugs that consisted of the patient’s pain management: he was administered naproxen (similar to Aleve) three times a day, tramadol (an opioid analgesic used for treating severe pain) four times a day, extended release morphine twice daily, hydrocodone/acetaminophen every four hours as needed, two lidocaine patches (used to control neuropathic pain) every 24 hours, and gabapentin (an anticonvulsant used for treating neuropathic pain) four times daily (Wilcher et al.). Each of these drugs was administered in significant dosages, and this pharmaceutical cocktail was also accompanied by the use of a trans-cutaneous electrical stimulation unit (Wilcher et al.). Despite the drugs and electrical stimulation, the patient reported no relief from his excruciating phantom pain. The authors write that the patient’s pain “was so severe that it affected his blood pressure” (Wilcher et al.).

The need for treatments that effectively manage and treat PLP is evident. Narcotic drugs have several potentially dangerous side effects, and do not seem to eliminate pain

in phantom limbs. Over-the-counter drugs can also harm the body, and prove ineffective at dampening PLP. Due to the realization that pharmaceuticals present serious issues for patients with PLP (and patients with any other kind of chronic pain), specialists over the past 30 years have begun “investigating nondrug treatments for chronic pain” (Cloud 82). Phantom pain falls into the chronic pain category, and some of the new treatments that developed may benefit amputees who do not have a limb to needle or massage. Some of these therapies, including “yoga, herbal remedies, meditation, tai chi, and mindfulness-based psychotherapy” have become more widely used and accepted (82). This greater public acceptance of alternative treatment methods may make it easier for other alternative treatments to gain popularity. However it is important to note that many in the medical and scientific fields still adhere to “traditional” means and methods; an idea or treatment may be popular with the public and specialists, but the greater medical and scientific communities may doubt its validity. For this reason we can see that an analysis of the rhetoric surrounding a treatment is necessary for understanding how that treatment is “effective” by means and measures other than those traditionally considered.

The Emergence of Mirror-Box Therapy as an Alternative Treatment

One alternative therapy that is slowly working its way toward both popular and medical acceptance is MBT. According to Jennifer Trueland, current MBT was pioneered by Ramachandran in the 1990s. We saw earlier in this review how Ramachandran theorized about the confused brain and the brain’s remapping process. Based on this concept, Ramachandran began thinking of how to help one of his patients whose phantom was paralyzed. He says that he started to ponder “virtual reality,” and wondered if they

could “create the visual illusion that the arm was restored and was obeying her [the patient’s] commands” (Ramachandran & Blakeslee 46). Ramachandran knew that creating a virtual reality machine to test his theories would be impossible because the cost would be so high, but he says that he ended up thinking of a way to do the experiment “with an ordinary mirror purchased from a five-and-dime store” (46). Ramachandran constructed his “mirror-box” by placing a mirror upright inside of a box with its top removed, and cutting two holes in the side (46). The authors explain the experiment this way:

“The front of the box has two holes in it, through which the patient inserts her ‘good hand’ (say, the right one) and her phantom hand (the left one). Since the mirror is in the middle of the box, the right hand is now on the right side of the mirror and the phantom is on the left side. The patient is then asked to view the reflection of her normal hand in the mirror and move it around slightly until the reflection appears to be superimposed on the felt position of her phantom hand. She has thus created the illusion of observing two hands, when in fact she is only seeing the mirror reflection of her intact hand ... Her brain receives confirming visual feedback that the phantom hand is moving correctly in response to her command.” (Ramachandran & Blakeslee 46)

The authors, however, wonder if this will actually help the patient in the long run to voluntarily move and control her paralyzed phantom.

In another preliminary trial, Philip Martinez underwent mirror therapy ten years after losing his arm in a motorcycle accident (Ramachandran & Blakeslee 47). When he came to see Ramachandran, Martinez told the doctor that he was desperate for relief from his paralyzed phantom (47). Martinez “had never been able to move his phantom arm. It was “always fixed in an awkward position” (47). Ramachandran wondered if Martinez was suffering from learned paralysis, and decided to use mirror therapy in a manner

similar to what was described before. He asked Martinez to insert both of his arms into the box, and to move them simultaneously. Martinez protested that “oh, I can’t do that,” but Ramachandran asked him to try anyway (47). As he watched the mirror and attempted to make synchronized movements, Martinez suddenly cried out: “Oh, my God! Oh, my God! This is unbelievable. It’s mind-boggling! My left arm is plugged in again. I can move my arm again” (47-8).

The authors speculate that Martinez may have had “some temporary inhibition or block of the neural circuits that would ordinarily move the phantom” and that the visual feedback provided by MBT had overcome this block (48). Ramachandran explains while Martinez’s response was “exciting and provided some support for my hypothesis about learned paralysis, I went home that night and asked myself ‘so what?’” (48). His inherent skepticism aside, Ramachandran sent Martinez home with the mirror-box so he could use it daily. After three weeks of ten-minute daily therapy, Martinez reported that his phantom pain had vanished completely (49). Almost the entirety of his phantom arm had disappeared after three weeks; the elbow that had caused him the most pain was now gone, and all he could feel were his “phantom fingers and palm dangling” from his shoulder (49).

For Ramachandran this success was even more exciting than the initial results of the therapy. He writes that “I realized this was probably the first example in medical history of a successful ‘amputation’ of a phantom limb!” (Ramachandran and Blakeslee 49). The authors explain that after enough time using the mirror, the brain keeps receiving conflicting information regarding whether or not the arm is present. Finally, the

mind resorts to a form of denial; the only way for the brain to “deal with this bizarre sensory conflict is to say, ‘to hell with it, there is no arm!’” (50). Martinez was the first of several people who have successfully battled their PLP using the mysterious therapy. Another early patient, Jimmie, is described in Ramachandran’s *The Tell-Tale Brain*. Jimmie’s phantom was “subject to painful cramping that his doctors could do nothing about,” and Ramachandran says he approached Jimmie about trying MBT, saying it might be “slightly off-the-wall” (60). Jimmie seemed willing to try anything, and Ramachandran had him insert his arms into the box as the other patients had done. He asked Jimmie to willfully move both arms at once, and as he looked into the mirror Jimmie exclaimed that “it’s like it’s plugged back in!” (61). Similar to Martinez, Jimmie was able to command his phantom limb to move, and in addition his phantom spasms were relieved for the first time in many years (61).

Another of Ramachandran’s patients, Ron, “took the mirror-box home and played around with it for three weeks in his spare time” (61). After these three weeks, Ron reported that his phantom limb was completely gone, and that his PLP had been eliminated. Ramachandran explains that they were all very surprised; had a simple mirror really just relieved this man’s painful and frustrating condition? Ramachandran supposed that the same thing had taken place that took place with Martinez and Jimmie: the contradicting feedback caused the brain to “give up” on the limb (61). He admits that when he “first observed this disappearance of the phantom ... I myself didn’t quite believe it” (61). Ramachandran writes that “the notion that you could amputate a

phantom with a mirror seemed outlandish, but now it has been replicated by other groups of researchers” (61).

Indeed, the early successes of MBT did *not* go unnoticed. Patients who have run out of viable options for treating their pain are more willing to try alternative methods, and physicians have realized a potential treatment in MBT. Some physicians and neuroscientists have started using Ramachandran’s therapy in their own practices, and their results add to the growing body of non-traditional yet undeniable data. Though it is not yet known *how* the therapy works, it is known that it *does* work. It is clear that while MBT is not currently deemed “effective” by traditional medical measures, some in the medical community have been compelled to use the therapy based on the incredible results of very few trials.

According to Mark Borgini in *Psychology Today*, a recent study at the Walter Reed Army Hospital led by Dr. Jack Tsao used mirror therapy with one of their study groups. The study groups were working to determine which psycho-based therapies would most effectively eliminate PLP; while one group performed the “normal” mirror therapy, a second group performed the therapy with the mirror covered, and a third group did visualization exercises without a mirror present (Borgini). The results are extremely compelling; in the “normal” mirror group, the “number and length of PLP episodes decreased by 100%,” in the covered-mirror group these episodes decreased by seventeen percent, and by 33% in the visualization group (Borgini). The author explains that when groups two and three switched to the normal MBT, they too reported further decreases in

their pain (Borgini). Borgini concludes that “it appears mirror therapy is a novel and safe therapy for the often perplexing problem of phantom limb pain.”

Tsao uses this therapy to treat veterans returning from Iraq and Afghanistan who have lost limbs while serving. His technique is similar to the one used by Ramachandran, and Tsao also reports positive initial results (Helm & Stoppler). Using MBT has allowed Tsao to help patients “decrease opioid use and painful phantom sensations” (Helm & Stoppler). Tsao was involved with the group that “conducted the first controlled trial of mirror therapy” in 2005, prompted by the fact that no randomized or controlled study of MBT had been conducted since Ramachandran’s experiments in the 1990s (Patoine). Not all of the participants believed the therapy would work; Army Sgt. Nicholas Paupore experienced excruciating pain in his phantom leg, but was initially skeptical about using a mirror to relieve his pain (Young). Skepticism is a healthy and common reaction when we are presented with something that we cannot quite understand or explain. However, as noted previously, one would suspect that those facing PLP would be willing to try *almost* anything to alleviate their pain. The initial successes of the therapy probably help convince many to try the treatment who otherwise would not. Tsao, quoted by Donna Miles, explains that “the mirror works for most people who have tried it,” and although it has not eliminate all pain in all participants, most people leave feeling *less pain* than when they started.

Others have begun to use Ramachandran’s therapy to treat PLP and other conditions. Dr. Jeffrey Cohen, with New York University’s Rusk Institute of Rehabilitation Medicine, uses the therapy in the institute’s Limb-Loss Program (Cloud

88). One of Cohen's patients, Mark Constantino, uses the therapy to manage the PLP in his missing leg. The therapy has helped Constantino reduce his PLP "from a fairly bad seven (on a scale of one to ten) to an annoying but tolerable two to three," and the results of four weeks of using MBT had lasted for months at the time of the interview (88). Mary Jane Cole, chair of the British Association of Chartered Physiotherapists in Amputee Rehabilitation, uses MBT where she works at Queen Mary's Hospital in Roehampton. In the article by Trueland, Cole explains that she uses a mirror therapy similar to Ramachandran's. Before therapy is initiated the patients are asked to report their pain via a recognized scale in order to mark improvement (Trueland). Cole reports that the treatment is most effective when the problem is localized, i.e. a finger or a foot, and that overall the results have been positive (Trueland).

Dr. Candy McCabe has pioneered the use of MBT to treat regional pain syndrome, while Dr. Chris Carr with the Acute Stroke Unit at Derriford Hospital in Plymouth uses large mirrors to give visual feedback to patients with stroke, neurological and/or balance problems (Trueland). Ramachandran writes in *The Tell-Tale Brain* that "more clinical applications for [MBT] continue to emerge" (62). He explains that the therapy is now being used to treat Type II complex regional pain syndrome, which "manifests in about ten percent of stroke victims" (62). Ramachandran discusses that in the late 1990s MBT was tested by "two research groups and found to be effective in treating complex regional pain syndrome Type II in a majority of patients," and that both studies "were conducted double-blind using placebo controls" (63).

While this therapy may be effective for many of those who have employed its use, MBT itself is still not widely recognized as a treatment for PLP. The legitimacy of the treatment may grow as more and more physicians and scientists conduct studies with mirrors as their focus. It is well-known that larger samples and greater numbers of studies produce data with a higher validity and reliability. An increased interest in MBT will potentially lead to an increased number of independent studies and trials. Even this may not be sufficient: the scientific and medical communities are based almost completely on hard facts and data; MBT may alleviate PLP, but no one can prove *how*. In all of his books, Ramachandran theorizes about how MBT works, but he does not have concrete data to support his hypotheses. Other believers in the phenomenon have struggled with how to breach the topic. When Weir-Mitchell first wrote about phantom limbs, he did so under a pseudonym for the popular magazine *Lippincott's Journal* (Ramachandran & Blakeslee 23). The authors indicate that Weir-Mitchell did not want to risk the ridicule from his colleagues that would result had he published under his own name in a professional medical journal; they note that “phantoms, when you think about it, are a spooky phenomenon” (23).

Spooky or not, phantom limbs and PLP are a clearly felt *truth* in many amputees' reality. The emergence of MBT has given a small number of patients some relief, and these relatively small yet positive results seem to be spreading to other practitioners of medicine. Due to the mysterious nature of both the condition and the treatment, it may be a long time before conventional science and medicine accept MBT into the fold. However, if we look at the phenomenon and therapy from a pragmatic standpoint, we

may begin to understand how they occur. This therapy, because it is not yet cemented in concrete results, has yet to be deemed an “effective” treatment by the traditional measures. More work and data is needed before the therapy is fully accepted as a viable treatment for MBT. Efforts have been made to ensure that MBT studies are conducted as scientifically as possible, but that is not necessarily enough to proclaim conclusive results. Thus, Ramachandran and others who use MBT must convince interested parties and skeptics alike that this therapy is worthy of attention and acceptance.

Persuading others to use the therapy is beneficial to several parties in several ways: more use of the therapy produces more results, thereby increasing the legitimacy of the technique as a means to reduce PLP; studies conducted by various researchers on various types of PLP also add support to the therapy in this way. Physicians benefit because they are able to offer a new treatment that has shown potential to reduce PLP in those who have used it. Finally, the amputees themselves benefit if their PLP is reduced even just *slightly* by MBT. Open minds and persuasive rhetoric are needed to advance the wider study of this therapy and its effects on PLP and other conditions.

If MBT works “because people think it works,” then it becomes necessary to understand *why* people think it works. An analysis of Ramachandran’s rhetoric becomes the key to explaining how well his persuasive techniques open up pragmatic opportunities for use and testing. The method for analysis, which is described in the coming chapter, is as novel as the pain the amputees experience and the therapy that Ramachandran has developed and promotes.

CHAPTER III: METHOD

In order to analyze whether Ramachandran's rhetoric regarding MBT has been persuasive, we will use a method that seeks to *criticize* rhetoric with a *pragmatic* view. In the January-February 2010 issue of the *Western Journal of Communication*, communication scholar Scott Stroud published the article "What Does Pragmatic Meliorism Mean for Rhetoric?" This is a new and untested method, and it is a fitting match for the novelty presented in PLP and MBT, as well as an appropriate means for critiquing and evaluating Ramachandran's rhetoric.

This chapter will proceed in four sections. The first will feature a background of rhetoric, pragmatism, and the ties that link the two. The works of Everett Lee Hunt, Robert Scott, Lloyd Bitzer, Stephen Mailloux, and James Mackin will be discussed to show the historical lineage of the two fields and their intersections. In the second section there will be a detailed discussion of Stroud's article, focusing primarily on the entailments of meliorism that he presents, his division of rhetoric into subclasses, and the four maxims he details to increase meliorism in rhetorical scholarship and practice. The third section will be a presentation of Mark Porrovecchio's response to and criticism of Stroud's article and method. In the final section I will defend this budding method against criticism and reiterate why it is appropriate for application to the artifact.

A Brief History of Rhetoric and Pragmatism

The early history of speech communication is also the early history of a return to rhetoric that was beyond the confines of English and the denigration of philosophy. One of this area's first-generation scholars sought to justify rhetoric not through Plato or

Aristotle, but by the sophistic thoughts of Protagoras. As such, Everett Lee Hunt provides one of the earliest intimations that this sophistical turn in rhetoric was at the same time a pragmatic one. In “Plato and Aristotle on Rhetoric and Rhetoricians,” Hunt explains that Protagoras was “older and matured later” than some of his contemporaries, and was “therefore more affected by the movement away from the natural sciences” (7). He writes that as a humanist, Protagoras devoted a large portion of his energy to “definitely rhetorical instruction” (Hunt 8). Hunt explains that “the philosophical doctrine for which Protagoras is chiefly known” is summarized in “the dictum that man is the measure of all things” (11). He also notes that American pragmatist F.C.S. Schiller devoted two dialogues to Protagoras in his *Studies on Humanism* (12). Hunt provides two excerpts from Schiller’s *Studies*, one in which Schiller argues that our only hope of “understanding knowledge” and “keeping philosophy alive by nourishing it with the realities of life” lies in ceasing to “misunderstand the great teacher who discovered the measure of man’s universe” (12).

As the interests in rhetoric rose and the promises of pragmatism waned in the years following the Second World War, the clues provided by Hunt remained largely untouched. However, things would change; scholars began to recognize that the true value of rhetoric lay in those aspects which differentiated it from philosophical abstraction and formal or traditional truths. By the late 1960s the field of speech communication was fully established, and at that point scholars once again turned to the hints left by Hunt. They confirmed the fact that rhetoric, like pragmatism, recognizes that a demand for *certainty* is often nearly impossible and illusory. To account for this, both

search for some relative degree of certainty that is necessary to move forward in life. In 1967 Robert Scott published “On Viewing Rhetoric as Epistemic,” in which he lists rhetoric “among the oldest of the arts of Western civilization” (131). Scott explains that from the beginning one of the major issues regarding rhetoric is its assumption that man can possess the truth (132). He writes that if this is correct, and we take true as it “is ordinarily taken, then rhetoric is of limited value” (132). If the effectiveness of a new therapy or treatment is easily proven to be true (via traditional measures) then the rhetoric surrounding that therapy is not going to be as influential or important.

Scott discusses Stephen Toulmin’s *The Uses of Argument* (1958), in which Toulmin argues that the question “How do I know?” is an ambiguous one (Scott 132). According to Scott, Toulmin writes that “the goal has been to obtain some standard or standards to satisfy the question, ‘How can I be certain of my conclusion?’” (132). This idea again applies neatly to a new or novel therapy that cannot be explained by traditionally-accepted means. The goal becomes either creating new means of measurement *or* recognizing that the lack of supporting evidence does not change the fact that the therapy *appears* to be effective. In fact, Scott asserts that our conclusions, drawn from experiences, do not follow necessarily from true premises, and that this “is to say we are not certain by the standard required” (133). This idea is especially relevant for understanding *that something works* even if we cannot explain *why* it works (per the established standards).

Scott concludes that “at best (or at least) truth must be seen as dual: the demands of the precepts one adheres to and the demands of the circumstances in which one must

act” (138). The “truth” of a new treatment’s effectiveness may be more readily apparent when the precepts (the traditional ways of thinking) are loosened and the demands (the need for the treatment) are extreme. Scott explains that humans must not consider truth as something “fixed and final,” but rather something “to be created moment by moment in the circumstances in which he finds himself and with which he must cope” (138). An example of this was present in the previous chapter: Army Sgt. Paupore was initially skeptical of the therapy to treat his agonizing pain. For him, “truth” and “reality” were the PLP he faced daily. However, as Paupore began using the therapy his truth and reality changed, and over the course of a month it was eventually “true” that MBT was effective at eliminating his PLP (he went off painkillers completely at that point) (Young). Scott explains that rhetoric, in terms of human affairs, “is a way of knowing; it is epistemic” (138).

Coming closely behind Scott’s epistemic observations, Lloyd Bitzer argues that rhetoric functions less as a way of probable knowing, and more as a pragmatic approach when it helps to remove urgent problems (which Bitzer calls exigencies) and replaces them with possible and productive revisions. His “The Rhetorical Situation” served as the introductory essay for the 1968 inaugural issue of *Philosophy and Rhetoric*. In this work, Bitzer’s central argument is that rhetoric is situational. By this he means that rhetoric does not just arise for the sake of itself; instead, rhetorical works “obtain their character from the circumstances of the historic context in which they occur,” and that in this way they are analogous with moral acts (Bitzer 3). He writes that “a work is rhetorical because it is a response to a situation of a certain kind” (3). In order to understand how rhetoric

and situation are related, Bitzer notes that we must acknowledge a common but fundamental viewpoint: “a work of rhetoric is pragmatic; it comes into existences for the sake of something beyond itself; it functions ultimately to produce action or to change the world; it performs some task” (3-4). In short, “rhetoric is a mode of altering reality” (4). Bitzer concludes that a perfect world would have no need for rhetoric because situations needing it would not arise (13). However, he says that in this imperfect world “the practical justification of rhetoric is analogous to that of scientific inquiry: the world presents objects to be known, puzzles to be resolved,” and hence there is “the practical need for scientific inquiry and discourse” (12-3). In this way “rhetoric is distinguished from the mere craft of persuasion” (13).

The idea of a novel therapy for a neurological condition certainly fits into the modern historical context. This context is one in which the advances of medicine and neuroscience have told us more than we have ever known about ourselves, yet is not able to sufficiently explain why certain conditions exist and why some treatments “work.” For this reason, the rhetoric surrounding such issues is in response to the situation and vitally important. Rhetoric supporting alternative and new treatments seeks to promote action or change in the world, both for the patients and for the medical and scientific communities where strict standards must be met. As Bitzer says, the world presents puzzles to be resolved, and the puzzle of how and why the mirror therapy works is one of our world’s current enigmas.

One of the recognized tensions resulting from the merger of pragmatism and rhetoric has to do with definitions. As Bitzer pointed out, rhetoric is pragmatic, but the

exact definition of the term is not necessarily agreed upon. Indeed, one early critic called pragmatism “chameleon-like” because of all its differences among individual pragmatists and the inconsistencies across the philosophy. Communication scholar James Mackin saw this tension and sought to address it in his “Rhetoric, Pragmatism, and Practical Wisdom” in *Rhetoric and Philosophy* (1990). In this work Mackin defines pragmatism by those concepts which seem to appear consistently throughout the continuum. He writes that a pragmatic approach is one that not only “demands that our actions should agree with our ideals, but because it insists that we discover meaning in action and not in the contemplation of metaphysical essences” (Mackin 275). Mackin explains that religious belief (and I would argue any belief) “that does not result in action is not so much hypocritical as it is meaningless,” and that “pragmatism bases itself in an integral relationship between action and meaning” (275). He writes that pragmatism “results in a new approach to the traditional problems of philosophy” by emphasizing action and consequences (275). For the pragmatist, the “overriding concern” is practical wisdom and consequences.

Like Scott, Mackin discusses epistemology as it relates to rhetoric and pragmatism. Mackin explains that for the pragmatist, “knowledge is predictive of consequences;” he says that to know the truth is to know consequences, and that this is the root of William James’s “often misunderstood statement” on the cash-value of truth (278). The author notes that our human experience “includes the experience of relationships between events,” and he quotes James who said that “truth is essentially bound up with the way in which one moment in our experiences may lead us towards

other moments which will be worth while to have been led to” (278). Mackin writes that for the pragmatist, knowledge is instrumental, and that “knowing occurs in the process of inquiry” (279). He explains that knowing is “an act of inquiry performed by the agent for the purpose of changing an indeterminate situation into a more determinate one” (279).

Here is a good example of how a pragmatic view might approach the unexplained effectiveness of an alternative treatment. For the pragmatist, the “truth” of the therapy’s efficacy would undoubtedly lie in the *practical consequences* of its use. Knowledge of some of these alternative treatments has been acquired due to the fact that some have chosen to inquire about and explore unique phenomena. The indeterminate situation is the current situation regarding (as of yet) unexplainable therapies; the exploration of and rhetoric surrounding the indeterminate situation seeks to establish a more determinate (i.e. supported) situation.

Mackin’s final discussion focuses on a pragmatic theory of rhetoric, arguing that “if rhetoric has any affect whatsoever, then the consequences of rhetorical action are a changed situation” (285). He explains that for the pragmatists, rhetoric is “public communication that influences public action” (285). Rhetoric serves the public by providing a method “for the larger community to strike a balance between stability and adaptability in satisfying the interests of its constituent members;” it serves “as the larger community’s means of conducting inquiry into problematic situations” (291). The situation regarding unproven, alternative therapies is indeed problematic at its current state; a therapy may appear to be effective at alleviating a given condition, yet if none can offer scientific “proof” as to how or why it accomplishes this task, it remains largely

unsupported and unaccepted. The rhetoric of someone such as Ramachandran, then, would serve the public by persuading it that the new therapy can potentially help those suffering from conditions that have no treatment or cure. A public that believes a treatment may work will be more likely to accept its use; increased use would again lead to increased data regarding its employment.

The connection of rhetoric and philosophy has also been explored and asserted by individuals outside those areas of inquiry. Cognizant of the issues raised by Mackin, English scholar Steven Mailloux sought in 1998 to show how pragmatism aids rhetoric and rhetoric aids pragmatism; it is probably one of the clearest formulations of this idea. In a chapter titled “The Sophistry of Rhetorical Pragmatism” from his *Reception Histories: Rhetoric, Pragmatism, and American Cultural Politics* (1998), Mailloux discusses the ways in which pragmatism, rhetoric, and sophistry square with one another in “their theoretical and political implications” (22). He explains the revival of American pragmatism in the 1990s, writing that pragmatism is now being “intensely discussed in such fields as American studies, political science, historiography, speech communication [as we know, an umbrella under which rhetoric falls], composition, law, and religious studies” (22). (I ask at this juncture, why not also science and medicine? Could they not also benefit from incorporating a pragmatic approach?) Mailloux explains that the connection between rhetoric and pragmatism really began at the turn of the last century, when William James translated and argued against Jean Bourdeau’s 1907 critique of pragmatism titled “Une Sophistique du Pragmatism” (22).

The founders of pragmatism struggled with the concepts of “true” and “truth” in much the same way rhetoricians have. Mailloux writes that in the *Dictionary of Philosophy and Psychology* (1902) there were “entries by three of the founders of pragmatism: James, C.S. Peirce, and John Dewey” (23). Under the “Pragmatism” entry, James “extends his methodological maxim towards a pragmatic notion of truth,” defining pragmatism as:

“...the doctrine that the whole ‘meaning’ of a conception expresses itself in practical consequences, consequences either in the shape of conduct to be recommended, or in that of experiences to be expected, if the conception be true; which consequences would be different if it were untrue, and must be different from the consequences by which the meaning of other conceptions is in turn expressed.” (qtd. in Mailloux 23-4)

At different points in pragmatism’s lineage, controversial notions such as “truth is what works; truth is the expedient way of thinking; and truth is warranted assertability” were supported (24). Mailloux explains that according to another early twentieth century pragmatist, Schiller, the “truth claims advanced by men, the measures asserted by individuals, must be negotiated among other men” (28).

The combination of pragmatism and rhetoric, which places “man as the measure” and the necessary duality of truth at its core, is strikingly appropriate for looking at MBT. In the coming analysis chapter, Ramachandran’s rhetoric will be analyzed and criticized using Stroud’s method. This method takes into account the contextual import of rhetoric and pragmatism, and it assesses the value of “truth” in *use* versus the traditional and abstract truth that is resistant to change and inquiry. The following section will describe Stroud’s method in detail.

Pragmatic Meliorism as Method

The work of Hunt, Scott, Bitzer, Mackin, and Mailloux provided a foundation that has largely remained untouched. Other than the applications of Bitzer's theory as a form of method in the 1980s and 90s, that foundation has had almost nothing else built upon it. As previous scholars confirmed and explored the connections between rhetoric and philosophy, they *indicated* a method rather than *providing* one. However, one individual took these indications and sought to create a method with the rhetoric-pragmatism connection at its center. There is a bit of irony that a philosopher, working in speech communication, was the one to finally successfully specify the conditions for analyzing rhetoric from a pragmatic standpoint. That scholar is Scott Stroud. In "What Does Pragmatic Meliorism Mean for Rhetoric?" (2010), Stroud explains how meliorism can be viewed as method, and argues for a new and melioristic way of doing rhetorical research and practice. Before discussing meliorism, he comments on both rhetoric and pragmatism, saying the former "seems aptly oriented toward the timely, the practical, and that which matters for actual communities and people," while the latter "is an intellectual tradition that clearly focuses on the practical and lived experience" (Stroud 44). Based on the artifact for analysis, it seems that Stroud's comments are especially relevant. And he justifies his study by explaining that while rhetoric and pragmatism share many common themes, meliorism is not one of them.

Stroud seems to profess Dewey's definition of meliorism, which in summary states that any given situation may be bettered, no matter the circumstances of the situation. For Dewey, meliorism encourages studying positive means of good and to "put

forth endeavor for the improvement of conditions” (Stroud 45). Stroud explains that a “vital part of meliorism is that the ideal elements that guide us (the ‘good’) are always found on lived experience,” and that any given situation will have a combination of good and bad elements (45). Thus, we “know” that which is good and bad based on past experiences with the object under discussion. Without lived experience, we have no basis from which to judge something as one way or the other.

Having defined what meliorism encourages and strives for, Stroud moves on to detail the aspects of meliorism as method. He begins by explaining three entailments of meliorism (M1-3), using them to show the elements that melioristic study must contain. The first (M1) states that “meliorism entails an account of some sort of end or goal to activity,” and that the sought end state may be either positive or negative (45). An example of a negative end state would be being free from some habit, while a positive end state would be having or instantiating a condition (45). The second entailment, (M2), states that “meliorism entails attention to the means used to reach this end state or goal;” this entailment is accompanied by a secondary piece, (M2.1), which says “this attention will involve empirical testing and explorations of concrete means of change” (45-6). Stroud argues that because the change we seek is “in ourselves or the world,” it is necessary to determine the proper means for achieving that goal (46). He also notes one challenge, saying that condition (M2.1) “represents a challenge for contemporary scholars in rhetorical studies” as it takes them beyond their comfort zone of “argument and textual analysis to inquiry concerning actual functioning” (46). This condition means that there will often be “some employment of empirical means of investigation into what

one asserts is occurring and the putative means of altering such states of affairs” (47). I think this entailment and condition are especially relevant to the rhetoric of new and alternative medical treatments: the (negative) end goal would be the absence of some ailment or condition, and the means to reach that goal would be the use of the alternative treatment. The increased use of the treatment would lead to increased empirical data regarding its effectiveness at engaging a given condition.

The final entailment (M3) states that “meliorism entails (a) a unit of analysis, and (b) a vector of change” (45). The main focus of this entailment is that which one seeks to change. Stroud says that this is a crucial aspect to meliorism, and that it can be divided into the two parts listed above (47). The unit of analysis “deals with what exactly can be improved” (such as the individual or the community), while the vector of change asks: “Where exactly is the means of change instantiated?” (47). He explains that the vector may be a new habit that an individual adopts, or a new way of organizing community members (48).

After discussing the entailments of meliorism, Stroud turns his attention to rhetorical scholarship and practice. He divides rhetoric into three subclasses (R1-3) and explains each in detail. The first, (R1), pertains to “rhetorical scholarship as theorizing about human discourse and persuasion” (49). Stroud writes that according to this first subclass, rhetorical scholarship is “practiced as a general account of uses, powers, limits, and characteristics of language use” (49). I would argue that this subclass should also contain elements of persuasion other than *just* language use, as human-to-human discourse is richer and more complex than simple text. The second subclass (R2) is

“rhetorical scholarship as critical practice in reference to specific texts” (49). This subclass calls for the critical examination of texts for ideologies, and views the act of criticism as connected to the improvement of communication (49). The third and final subclass, (R3), is “rhetorical scholarship focusing on the practice of argument and persuasion” (49). Because this subclass deals with practiced persuasion, Stroud explains that it “captures the applied, pedagogical sense of the study of rhetoric – knowing how to teach individuals to use language in certain effective and meaningful ways” (49). Stroud writes that most rhetorical scholarship (and I would argue, practice) with the general goal of improving lived experience “is covered by at least one of these designations” (49).

Having given detailed accounts of what meliorism seeks and what rhetoric is comprised of, Stroud then proceeds to explain how the three melioristic entailments would apply to the three rhetoric subclasses. From there he sets forth four maxims for melioristic rhetorical studies. Stroud acknowledges that “much current scholarship does not follow the lead of meliorism,” but that such scholarship is not necessarily without value – instead it simply is not fully meliorative (55). Perhaps more scholarship and practice does follow the melioristic path; it is just that it has not been analyzed using a method with meliorism as the focus. The use of this particular method may bring to light not only how rhetorical practice can be made more melioristic, but also other rhetorical practice or scholarship that is already so.

Stroud’s reason for presenting the four maxims is his belief that meliorative research has something unique to offer rhetorical studies (55). The first maxim asserts that research must “attend to how ‘rhetoric’ is being used and what effects on experience

this use portends” (55). Stroud explains that when we talk of “rhetoric” and its study, we need to consider what it is in regards to (a theory, as specific text, the actual training of individuals, etc) (55). He writes that “meliorism would demand that rhetorical scholars be clear about which sense of rhetoric they are employing, and more importantly, be clear as to the impact of this sense on their project” (55). Stroud says that pragmatists like Dewey “would insist we not take for granted that scholarship affects lived experience,” and again we can see where this method appears to be fitting for the rhetoric of new and alternative treatments (55).

The second maxim states that one “should attend to the ends of one’s scholarship” (55). This could be considered the “so what?” question that researchers ask. The “so what?” wants to know *why* the research is important and what kind of *impact* it could have. Stroud explains that rhetorical scholars “must consider what sort of difference their work will make, if all goes well” (55). To be meliorative, rhetorical scholarship should have some idea of “what effects in actual people and lived experience it ought to affect if it is successful” (55). In other words, it should take the *practical consequences* of its “actions” into consideration. Stroud explains that a mere quest for correctness or descriptive accuracy or certainty is *not* meliorative (55). He asserts that melioristic rhetorical studies “must maintain a clear connection to what it wants to affect, and a clear idea as to where such a change is desired” (55).

The third maxim says one must “attend to the ends of one’s scholarship,” and pertains to the exploration into the means for reaching the desired end goal. Stroud writes that “truly melioristic schemes of exploration would explore ways to intervene in a

community in order to improve it,” and that such an intervention should “have replicable measures of improvement” (56). He explains that consideration of the effects of our scholarship is what takes meliorism beyond wishful thinking that our scholarship may have some effect (56).

The fourth and final maxim states that one should “attend to the habits one’s scholarship elucidates and inculcates” (56). Stroud explains that rhetorical studies “could explore what sorts of habits ought to be cultivated in, say, rhetorically competent individuals, especially given the burgeoning realm of new media” (56). He writes that because meliorists (such as Dewey) are set against any is/ought dichotomy, they would therefore “encourage us to employ descriptive/empirical methods in explicating and verifying our normative procedures” (56).

Stroud concludes his article by reiterating the benefits of how meliorism may impact rhetorical scholarship. He says that “the meliorist would merely want to amplify those tendencies that directly connect rhetorical scholarship (and, I argue, practice) to improving lived experience, as well as to further the connection of rhetoric and empirical methods of verification and intervention” (57). For Stroud, the hybrid of pragmatism and rhetoric is an exciting one, and one that he argues could lead to a “potentially melioristic future for those who study rhetoric” (57).

Now that we better understand the concept of pragmatic meliorism as method, I want to discuss some of the issues raised in a critique of Stroud’s article. By examining the response and concerns of another rhetorical scholar, we will be able to see what limitations exist within the method and how they may be overcome during the analysis.

Response and Criticisms

In “To Hope Till Hope Creates: A Reply to ‘What Does Pragmatic Meliorism Mean for Rhetoric?’” (2010), Porrovecchio argues that, while perhaps well-intentioned, Stroud leaves too many loose ends in his young theory and method. After discussing Porrovecchio’s various contentions, I will explain how the use of this method in my thesis satisfies that very thing that both Stroud and Porrovecchio call for.

One of the main arguments that Porrovecchio makes is in regard to Stroud’s lack of clear definitions. Porrovecchio acknowledges that “rhetoric is no longer a well-defined area of inquiry,” and that pragmatism, too, “suffers from (or profits by) being a slippery and variously understood concept” (62). For him, a merger of the two areas is “complex business” as such a merger assumes two things: first, that “both could be isolated and explained,” and second, that “the merger will make sense in terms of practice for both” (62). Porrovecchio writes that it is this point which raises his concerns most; he explains that just as the rhetoric of one will not be confused with that of another, the “pragmatism of Dewey will not be mistaken for that of James or Schiller” (62). Simply put, he feels there may be too many variances in both the way rhetoric and pragmatism are described and argued about (at the individual level) to simply assume isolation or merger is possible (62). However, Porrovecchio qualifies this by noting that “this isn’t to suggest that one can’t find tendencies that tie any of the former or latter with each other, or that one can’t gain from blending the insights of the latter with the former” (62).

Porrovecchio explains that pragmatism “is a way of viewing the world,” whereas the study of rhetoric “provides a way of understanding how we try to persuade in

contextually charged moment in the same” (62). He says that while Stroud was correct in asserting that rhetoric and pragmatism deserve further exploration of this interaction, he fails by “being too willing to assume that the result will be melioristic” (63).

Porrovecchio writes that this assumption confronts the fact that “one person’s good is another person’s bad,” a fact that “haunts the suggestions of pragmatists” (63). His solution is thus to “scrutinize arguments that merge rhetoric and pragmatism,” and to do so while considering “specific conditions and their potential improvement” (63).

In light of these concerns, Porrovecchio asks two questions of Stroud. He first inquires as to what Stroud means, *exactly*, by rhetoric and pragmatism (63). Secondly, he asks Stroud “to what ends and to which persons” his observations are directed (63).

Porrovecchio explains that if clear definitions of the two terms are not determined and conveyed, the outcomes in the second question could be “difficult to grapple with” (63).

He is also bothered by Stroud’s use of terms in association with rhetoric, such as rhetorical scholarship, because rhetoric and scholarship are not the same thing (63).

Porrovecchio explains that the “critique of the phenomena is rhetorical criticism just as the theory of the phenomena is rhetorical theory” (63). He explains that Stroud’s three rhetorical subclasses (R1-3) “do not help matters as they detail, under the awning of rhetorical scholarship,” three concepts that are not actually practices of rhetoric: theory, criticism, and theory/criticism (63). Porrovecchio believes that Stroud would argue that “all research dealing with rhetoric is, in fact, rhetoric,” and that this generalization makes the distinction between what is theorized or criticized and the object of theory or criticism a vague one (64).

Porrovecchio notes that this ambiguity is particularly troublesome because pragmatism is “a worldview generally endorsed because it emphasizes practice over theory” (64). In his opinion, Stroud’s (R1-3) fail because they never get beyond the “study stage” to the “endeavor stage” where the criticism or theory will translate into some action that will change actual events (64). He says these divisions similarly fail when examined from the Deweyian approach, which states that “research is used to formulated definite actions (only some rhetoric) to improve” actual practices (64). Due to the lack of action and attention to action, Porrovecchio is not satisfied with this stalwart attempt.

Because the action stage is missing, Porrovecchio argues that the “impact on ‘lived experience’ also remains vague” (65). He explains that the term itself is so very ambiguous because it is, at base, an individual’s conception (65). Porrovecchio writes that he is sure Stroud has an idea of what lived experience means (for him), just as he himself (Porrovecchio) has his own idea of what it means (65). Porrovecchio’s concern lies in the fact that he does not know if those two conceptions are the same, and that even if he asked Stroud in an attempt to find out, their realities and opinions may still differ in the end (65).

Porrovecchio points out several problems in Stroud’s method, but I argue that it is worth taking another look at these matters to show that, although new and possessing limitations, this method is appropriate for application to this artifact. By responding to Porrovecchio’s criticisms I will be able to justify the use of this method for this thesis.

Justification for Meliorism as Method

Before responding to the issues raised by Porrovecchio, I first want to reiterate that Stroud's method is not only novel, but also new. His method was only presented two years ago, and only one critical response has been published in reply. This is relevant because it is the usual course for theories and methods to undergo intense scrutiny and revision prior to forming the finished product. This makes my use of Stroud's method herein both challenging and pragmatic. One major challenge is that the only guide provided is Stroud's; there are no other studies to look to for suggestions, nor are there the well-established canons found in tested methods. As discussed before, my decision to employ this method carries with it a significant degree of novelty; what Stroud suggests, I now promote. But it is important to keep in mind that this testing will proceed in a pragmatic manner, through the application of the maxims to a specific set of Ramachandran's rhetoric that forms my artifact. That being said, the newness of Stroud's method has not protected it from criticism and rebuke. Before the method had moved beyond its first theoretical stages, one scholar in particular questioned whether the reward was worth the risk he believed was possible.

In the same issue in which Stroud promoted his budding method, rhetorical scholar Mark Porrovecchio challenged his very premise. In "To Hope Til Hope Creates: A Reply to 'What Does Pragmatic Meliorism Mean for Rhetoric?,'" Porrovecchio begins by pointing out Stroud's lack of clear definitions for rhetoric and pragmatism. For him, this is a major concern, because it means that Stroud assumes both terms can be isolated and that a merger of the two would benefit both in terms of practice. While Porrovecchio

is correct in asserting that these ambiguous definitions present an unresolved issue, I argue that he must concede the points regarding isolation and merger. If we do not assume that both terms can be isolated and defined, we cannot possibly hope to attempt a merger. If we cannot or do not attempt a merger, we will never discover the effects (positive or negative) of such a melding on the practice of either. Porrovecchio writes that Stroud is too easily convinced that the results of such a merger would be melioristic (63), but I argue that Stroud cannot effectively move forward without some kind of hypothesis.

There is a simple answer to this initial challenge: this study. My application of this method to Ramachandran's rhetoric in promotion of MBT is just the use which previous scholars pointed to, that Stroud hopes for, and that Porrovecchio demands. Its use also provides a way to find an operative definition for rhetoric in a pragmatic (i.e. melioristic) sense. I find it rather surprising that this point escaped Porrovecchio's initial review. The way we define and understand a concept is by its use and the practical consequences of that use; this is also how we revise our perception of said concept. If there is no use, there is no way to determine the practicality of the idea or action.

To this point we can agree that *rhetoric* applies to written and spoken discourses, and we can grant that *pragmatism* is primarily a method for resolving disputes in thought and action. But we must be able to effectively combine these two concepts to better understand a pragmatic method of rhetorical criticism. As stated at the beginning of this section, the inherent novelty in this whole undertaking is both highly exciting and terribly daunting. But the small "irritations of doubt" that are produced by such novel ideas are often just enough to lead to productive changes. In this way, Stroud's method is perfectly

fitting for analyzing an artifact that operates beyond the rigid standards of modern science and medicine.

The use of this method also answers to Porrovecchio's concern that (R1-3) do not move beyond the study stage to the action stage, the latter of which is emphasized *above* theory in pragmatism (64). By determining whether or not Ramachandran's rhetoric has been persuasive and melioristic, we will be able to see if and how melioristic rhetoric can bridge the divide to that critical stage. Because this action stage would be present, we would be able to see how Ramachandran's rhetoric affects lived experience, and what the practical consequences are for those whose realities are altered. There is ample testimony provided by amputees who have experienced PLP and who have turned to MBT as a potential treatment, so individual accounts of individual consequences are available to examine.

All told the arguments that Porrovecchio make are reasonable, but they do not justify *not* using Stroud's method. If anything, Porrovecchio provides strong justification for the use of this method in my study. The concerns that he points to are important and do warrant attention, and his illumination of them gives me the opportunity to specifically address and consider them as I conduct my analysis. Discrediting or ignoring this method would be ultimately un-pragmatic, and it would result in the loss of an extraordinary chance to study an interesting set of rhetoric regarding an innovative and hopeful therapy.

I believe this method can be applied rather "easily" to the artifact, and I say this because Stroud sets out his method in a fairly organized manner. As noted before, he specifies the three respective "parts" of rhetoric and pragmatism, and he neatly lays out

four maxims that will ultimately help to determine whether the examined rhetoric can be characterized as melioristic. Although this method was initially designed to advocate the creation of melioristic rhetoric and “doing melioristic studies” (Stroud 55), it will be used here to analyze rhetoric that *already exists*. This may be considered a limitation, but I believe the components of the method are clear enough that a retrospective examination will not present a great challenge to this study. Starting with the first, each maxim will be applied to Ramachandran’s rhetoric. Specific examples of his writing will be presented with each maxim to illustrate the degree to which his rhetoric has been persuasive and melioristic. The results will be discussed at the end and will give an overall indication of what these findings suggest.

CHAPTER IV: ANALYSIS

The method discussed in the previous section will be employed herein to determine whether Ramachandran’s rhetoric has proven melioristic; that is, whether or not it is an example of pragmatic persuasion. This chapter will progress in three sections. In the first, I will argue that Ramachandran possesses a certain “pragmatic temperament” that drives him to popularize his research and findings. I will also argue that Ramachandran’s pragmatic attitude influences the way he studies the brain and conducts experiments. The second section will feature the application of Stroud’s method to this artifact. As noted in the previous chapter, each maxim will be applied to Ramachandran’s rhetoric. The results of this analysis will be discussed in the third and final section. This part will be an assessment of what the findings suggest: conclusions will be drawn based on the analysis, and those conclusions will point to whether or not Ramachandran’s rhetoric has been persuasive and melioristic.

Ramachandran’s Rhetoric

It is a worthy endeavor to understand someone’s argument, but it is equally important to understand *why* one is compelled to promote that argument. In this section I will argue that Ramachandran’s pragmatic attitude is a leading reason why he chooses to write popular books designed to appeal *beyond* the scientific and medical communities. Clear indications of his pragmatic temperament are evident in these publications. For example, we find an interesting indication of Ramachandran’s core ideology in the “Preface” to *Phantoms in the Brain* (1998). He opens with a quotation by physicist John Archibald Wheeler: “in any field, find the strangest thing and then explore it”

(Ramachandran & Blakeslee xi). This desire to push beyond accepted standards may help explain, in part, why Ramachandran is drawn to exploring PLP and mirror therapy. It also helps illustrate why someone as esteemed as Ramachandran would openly promote and support a therapy that *cannot be explained*. This indicates his pragmatic sense because the pragmatic method is designed and used specifically to determine answers to obscure topics.

As William James notes in “What Pragmatism Means” (1907), “the pragmatic method is primarily a method of settling metaphysical disputes that otherwise might be interminable” (28). James goes on to suggest that the pragmatic method is used to “try to interpret each notion [of how a thing is] by tracing its respective practical consequences” (28). The question of PLP and MBT is one such metaphysical dispute, and the pragmatic method would require that each be interpreted by its “practical consequences” for the individual. The practical consequences of PLP, as we have seen, can be devastating for the individual and their loved ones. The practical consequence of MBT is the undisputed relief of PLP for many patients.

Ramachandran’s attempt to explore such a topic and the practical consequences of MBT is essentially pragmatic. James argues that whatever the thing is, we must draw from it “its practical cash-value, [and] set it at work within the stream of your experience” (32). He explains that in this way, “it appears less as a solution, then, than as a program for more work, and more particularly as an indication of the ways in which existing realities may be *changed*” (32). If this analysis shows that Ramachandran’s true

concern is the actual consequences of using mirror therapy, it will indicate that he is striving in this pragmatic way to change the existing realities of those with PLP.

The quest to answer such a mysterious and metaphysical question is something that can best be attempted through writing popular literature (as opposed to academic), and this is exactly what Ramachandran has done. In *Phantoms*, Ramachandran explains that textbook writing is “not my cut of tea;” but by contrast, he writes that “a popular book on the brain ... might be fun” (Ramachandran & Blakeslee xi). Although Ramachandran (at times with various coauthors) has published and continues to publish numerous articles in scientific and medical journals, I believe he wants to reach a wider audience. He makes it clear in this book that he has an urge to communicate his research and findings, particularly due to the fact that during the 1990s Ramachandran “gleaned many new insights into the workings of the human brain” (xi). He and his coauthor explain that when one is “involved in an enterprise as exciting as this, it’s natural human tendency to want to share your ideas with others” (xi).

Ramachandran appears to be genuinely excited about what he studies, and he feels obligated to make known to many what would normally be privileged information for privileged circles. One problem that arises when academics or scientists write for general audiences is that some of the information may literally be lost in translation. Ramachandran and Blakeslee explain that in these cases, the “professional scientists always have to walk a tightrope between making the book intelligible to the general reader,” and avoid oversimplification “so the experts are not annoyed” (xii).

Ramachandran and his coauthor have made provisions with this academic-public dichotomy in mind, and it is clear in *all* of Ramachandran's popular works that he is mindful of what both general audiences and his scientific peers require. In *Phantoms*, Ramachandran and Blakeslee's solution to this was to use endnotes, which they say serve three purposes: first, they are used to note exceptions and qualifications when concepts have been simplified in the text; second, the endnotes amplify points that are referred to only briefly in the text so readers can explore topics on their own; and third, they "point the reader to original references and credit those who have worked on similar topics" (xii). Ramachandran and his coauthor also provide a bibliography and a suggested readings section that follows the endnote appendix. This gives the general reader the ability not only to better understand concepts, but to also explore those areas which are of relevance and interest to them. It satisfies the scientific reader because the integrity of the information is maintained even though it is presented in a more simplified or succinct manner.

This idea carries through into Ramachandran's 2004 book *A Brief Tour of Human Consciousness*. In the opening sentence to the "Preface," Ramachandran explains that his "goal in writing this book has been to make neuroscience – the study of the brain – more accessible to a broad audience, to 'workingmen'" (ix). The idea of making a rhetorically-constructed worldview understandable and applicable to a wide and general public is essentially pragmatic; it is a theme that will be discussed in more detail at the end of this section.

As with *Phantoms*, Ramachandran again uses endnotes in each chapter of *A Brief Tour* to allow the reader to look into those concepts or stories which they would like to know more about. He also includes a glossary section (reproduced with permission from the Society of Neuroscience) that describes many neurological, anatomical, and pharmacological terms. Although Ramachandran usually defines terms when he introduces them, the glossary allows the reader to quickly define a term used later in the chapter or book. This again shows Ramachandran making an attempt to present the information in such a way that it is accessible and intelligible to those of us who are not scientists or physicians. And again, it shows Ramachandran's use of the previously-discussed pragmatic device of doing just this.

Ramachandran's most recent book, *The Tell-Tale Brain: A Neuroscientist's Quest for What Makes Us Human* (2011), follows suit of the others. Here, Ramachandran attempts to cater *most* to laypeople. Again, extensive endnotes, a detailed glossary, and a bibliography are all present to assist the general reader. In addition, he again addresses his target audience specifically, writing in the "Preface" that this work "is written in a conversational style for the general audience" (xvi). Ramachandran recognizes that in the end he faces "the standard challenge of popularization, which is to tread the fine line between simplification and accuracy" (xvi).

The general readers that Ramachandran targets are more likely than academic ones to recognize the potential of a new or non-traditional approach that moves beyond the established standards. As noted earlier, James discusses the "cash-value" of an idea, which is essentially the practicality or usefulness of an idea (32). Pragmatically speaking,

the theories that arise from this cash-value concept “thus become instruments, not answers to enigmas, in which we can rest” (32). James explains that from these theories, “we move forward, and, on occasion, make nature over again by their aid” (32). Pragmatic method and theory, James notes, possess “*anti-intellectualist* tendencies” (32), and provide an additional reason why general audiences are more prone to considering pragmatically-presented arguments. James uses the term “intellectualist” to denote those Absolute Idealists and logicians of his time, and it has a connotation of their overly-abstract theories and views.

Ramachandran’s pragmatic temperament clearly influences his popular writing, but before he was a writer he was a scientist. I will argue now that, although a scientist, Ramachandran’s pragmatic attitude also influences his field work and argument for that research. Ramachandran became interested in phantom limbs during his early medical education, and various factors over time drove him to his current research. As a man of science, Ramachandran is inherently skeptical. But as we have seen in his popular books, he has *always* been drawn to the curious and novel. Now that we have a better understanding of this pragmatic temperament, let’s take a closer look at how it manifests itself in Ramachandran’s academic and popular works promoting the use of MBT.

Ramachandran and Rogers-Ramachandran published “Synaesthesia in Phantom Limbs Induced with Mirrors” in the April 1996 issue of *Proceedings: Biological Sciences*. This article was published within the first few years after Ramachandran had been considering PLP and the MBT. Ramachandran and his coauthor begin by justifying their research, explaining that “almost no systematic psychophysical work has been

done” on patients with PLP (377). It appears that Ramachandran and Rogers-Ramachandran are dismayed at this lack of study and research, and this too demonstrates a pragmatic attitude. Pragmatists often consider those questions which have not been answered, or those topics which have not previously been debated; in other words, they think about old concepts in new ways. Here, Ramachandran and his coauthor argue that the long-known phenomenon of PLP should finally be given appropriate attention.

Ramachandran and his coauthor begin the story of MBT’s genesis by explaining that some patients experience “vivid movements in the phantom,” while others experience a phantom that is “‘frozen’ in a specific position” and cannot be moved even with great effort (377). The authors write that “the reason for these differences is obscure and needs careful investigation,” but Ramachandran and his coauthor conclude that the paralysis might be “learned” if the limb was paralyzed prior to amputation (377). Ramachandran and Rogers-Ramachandran explain how a lack of visual feedback that a paralyzed limb is moving may carry over once that limb is removed, as there is *still* no visual feedback that the limb is moving when the brain commands it (378).

Ramachandran and his coauthor explain their speculation that perhaps learned paralysis could be unlearned, and that in order to test such a theory, a patient would have to be able to send visual feedback confirming movement in their missing limb (378). An obvious obstacle, and one that Ramachandran and Rogers-Ramachandran strive to address, is that the amputee has no arm with which to send visual feedback (378)! Ramachandran and his coauthor write that they developed a “virtual reality box” that would (hypothetically) allow the patient to perceive movement in the missing limb; they

describe the construction of the mirror-box, as well as how the patient would use it to create the illusion of two intact limbs (378). Ramachandran and Rogers-Ramachandran ask if the employment of such a therapy would “somehow revive sensation of movement and voluntary control over the phantom” (378).

The article proceeds to describe the participants of the study, ten upper-limb amputees, who experimented with MBT in an attempt to answer the above question. One of the patients, D.S., had positive initial results with the therapy and was the inspiration for the larger study. It seems that at the time, Ramachandran and his coauthor wanted to do two things: first, they wanted to create a study using a larger sample size and a consistent technique on all ten patients. Secondly, Ramachandran’s team did a “complete neurological work-up” to determine psychological soundness prior to employing the therapy; this shows that they wanted to control as many of the variables as possible (379). In this way, Ramachandran and his coauthor are operating under both pragmatic and traditional influences: pragmatic because they are taking a new approach to study a novel phenomenon; traditionally scientific because they are adhering to recognized “standards” of acceptable research practices.

Ramachandran and Rogers-Ramachandran then describe their method for “administering” the therapy, explaining that some patients took the box home and continued the experiments on their own (380). Although this allows for more variables in the study, it also shows Ramachandran and his coauthor’s desire for those patients to experience positive results. And many of those patients did. Ramachandran and Rogers-Ramachandran writes that six patients felt their previously-paralyzed phantom move

when using MBT; patient D.S. felt movement in his phantom for the first time in the ten years since his amputation (377). Four of the five patients who had suffered from “clenching spasms” in their phantoms found relief using the therapy (377).

After using the box daily at home for three weeks, D.S. reported what Ramachandran and Rogers-Ramachandran excitedly refer to as “the first known case of an ‘amputation’ of a phantom limb!” (382). The patient’s original arm had already been amputated, but now they had eliminated the phantom limb as well. Two patients experienced some positive results, but were left with some residual discomfort. As Ramachandran and his coauthor explain, patient P.N. experience relief from the clenching spasms in her phantom, but a burning sensation in her fingers persisted (380). The authors note that this is “an important observation for it not only rules out placebo effects, but implies that only some kinds of discomfort may be relieved by the procedure” (380). Again, this indicates Ramachandran’s pragmatic attitude. The “truth” of the therapy’s effectiveness, pragmatically speaking, may be different for each participant.

The detailed account of patients and their individual results gives way to a discussion of conclusions and further questions. Ramachandran and Rogers-Ramachandran explain first that “until about a decade ago, it was widely believed that no new neural connections can emerge in the adult mammalian brain” (385). However, Ramachandran and his coauthor argue that such reorganization *can* occur, and that recent MEG (magnetoencephalophy) scans show it can “occur on a massive scale in adult humans” (385). This is an important point regarding neurology in general, and points again to James’s concept of the cash-value of new ideas and explorations.

Ramachandran and Rogers-Ramachandran also discuss the effects of MBT on phantom limb pain, an aside that will become greatly amplified in later works. Although MBT alleviated some of the pain caused by paralyzed or clenched phantoms, Ramachandran and his coauthor recognize the “notorious susceptibility of pain to ‘placebo’ and suggestion” (385). To address this, they encourage that these effects “be repeated on a large number of subjects using double-blind trials to see if the effect is a specific consequence of the visual feedback” (386). Without specifically saying so, it is clear that Ramachandran and Rogers-Ramachandran are concerned with the cash-value, the *practical consequences*, of this idea and therapy.

Two years later, Ramachandran published “Consciousness and Body Image: Lessons from Phantom Limbs, Capgas Syndrome and Pain Asymbolia” (1998) in *Philosophical Transactions: Biological Proceedings*. First, he explains the study he conducted, using amputees and “whole people” to “demonstrate the ... tremendous amount of latent plasticity even in the adult human brain” (Ramachandran 1851). This is a point that he made in his previous article, and one that is clearly central to his research. Ramachandran then gives a brief history of phantom limbs, noting that they “have probably been known since antiquity” (1851). He explains that while Silas Weir-Mitchell provided the first clinical description of phantom limbs in 1872, systematic work on these patients began only ten years earlier (1852).

Unlike the first article in which participants were discussed individually, here Ramachandran groups them and then reports on those groupings. This study, nearly twice the size of the one conducted in 1996, observed 18 amputee patients. After taking some

time to discuss the phenomenon of “face-to-phantom” sensation referral, Ramachandran proceeds to reflect on phantom limbs. Ramachandran describes some of the painful effects of these spasms, and his focus on the patients’ very real pain (an aspect of their current lived experience) is an important point to keep in mind regarding the pragmatic meliorism of his rhetoric. Ramachandran, in what will prove to be typical style, also includes patient and result information from his previous study and article with Rogers-Ramachandran.

This second article, like the first, is written in the language of science, and is drier than his popular works. However, Ramachandran’s popular books also include a great deal of information gleaned from his studies (albeit written in a more conversational tone). Portions of Ramachandran’s three books were discussed earlier to indicate his pragmatic drive for writing popular pieces; now, additional rhetoric from these books regarding studies into PLP and MBT will be included.

It seems that by the time the “Consciousness” article was published in 1998, Ramachandran’s attention had become more focused on the novel therapy and its possibilities for treating phantom limbs. This is made more apparent in the aforementioned book *Phantoms* he co-wrote with Blakeslee. Ramachandran and his coauthor indicate early in the book that certain tensions exist in neurology, and they justify their research against these tensions. Ramachandran and Blakeslee explain that a discontent exists between two ways of thinking; one way of thinking places high value on large analytical studies to learn about the brain; the other holds that doing the “right kinds of experiments on the right kinds of patients” can yield more useful information (xiii).

In fact, Ramachandran and Blakeslee call this entire debate “silly” because they feel the resolving method of inquiry is obvious: they argue that “it’s a good idea to begin with experiments on single cases and then to confirm the findings through studies of additional patients” (xiii). To illustrate this point, Ramachandran and his coauthor give the example of a talking pig. They explain that if they were to show us a talking pig, we would react with astonishment and surprise; we would not demand to see ten more talking pigs in order to be convinced that something extraordinary has taken place (xiii). This is an important point and one that again indicates Ramachandran’s pragmatic approach to experiments: reality is not always concrete, and is prone to change as our experiences and resulting beliefs change. In this manner, Ramachandran and Blakeslee support experiments done with MBT; there may not yet be large amounts of data that attest to the therapy’s effectiveness, but if anything this only serves to justify further research.

In an interesting pragmatic display, Ramachandran and his coauthor defend the need for (and their use of) speculation, explaining that the term has unfortunately acquired “a pejorative connotation among some scientists” (xv). To make their point, Ramachandran and Blakeslee quote English biologist Peter Medawar who wrote that “an imaginative conception of what might be true is the starting point of all great discoveries in science,” and Charles Darwin, who noted that “false hypotheses do little harm,” and that when “one path toward error is closed ... the road to truth is often at the same time opened” (xvi). Ramachandran and his coauthor explain that “every scientist knows that the best research emerges from a dialectic between speculation and healthy skepticism,”

but that *authors* must be responsible for indicating to their readers instances where they are speculating (xvi). The quotations are meant as framing comments, but Ramachandran channels them into more specific points of analysis.

In all, three of the chapters in *Phantoms* demand closer examination because of the attention to Ramachandran's arguments regarding PLP and MBT. In their first chapter, "The Phantom Within," Ramachandran and Blakeslee discuss multiple patients, all of whom suffer from bizarre neurological disorders. The authors make it known that *Phantoms* takes a different approach to these disorders than has been taken previously, both in terms of describing why they occur and how to treat them.

Chapter two, "Knowing Where to Scratch," focuses more closely on PLP. This chapter attempts to put a human face on the condition; Ramachandran and his coauthor discuss in detail the pain and accompanying issues that individuals with PLP face on a daily basis. The authors introduce one patient, Tom, who lost his arm violently at age seventeen in a car crash; Tom reported feeling phantom sensations soon after the wreck, and indicated to Ramachandran that he had felt them ever since (21). Ramachandran and Blakeslee explain, as Ramachandran had before, that some patients experience very severe and very real pain in their phantoms. This phantom pain not only hurts like "real" pain, it also has the added characteristic of being untreatable (until, possibly, now).

It is evident that there is a very human element to the issue of phantom pain. Ramachandran and Blakeslee give a brief history of PLP, a history that is long and detailed yet sparsely studied. They mention Weir-Mitchell, as Ramachandran had previously, saying that he was "so surprised by the phenomenon that he published the

first article on the subject under a pseudonym in a popular magazine ... rather than risk facing the ridicule from his colleagues that might have ensued” had he published in a scientific or medical journal (23). There are two key points here that should be highlighted: the first, from the previous paragraph, regards Ramachandran’s evident consideration for the lived experience of those with PLP. As we know, this is an important point when evaluating the meliorism of one’s rhetoric. The second point refers again to common audiences and their acceptance of the cash-value of novel ideas and thinking. It is interesting that Weir-Mitchell, like Ramachandran, also utilized this essentially pragmatic device in his own writings on PLP.

Moving beyond the human element, Ramachandran and Blakeslee go on to discuss how animal experiments inform Ramachandran’s work with phantom limbs. Ramachandran became interested in the work of Tim Pons and his colleagues; Pons wanted to record signals in the brains of monkeys who had been given, in effect, phantom limbs (the nerves attaching one arm to the spinal cord were completely severed) (27). Pons and his team conducted several experiments, the results of which mean “that you can change the [brain] map; you can alter the brain circuitry of an adult animal” (Ramachandran & Blakeslee 28). Ramachandran and Blakeslee explain that immediately upon reading Pons’s paper, Ramachandran thought “my God! Might this be an explanation for phantom limbs?” (28).

Ramachandran and Blakeslee use this epiphany as a launching point to discuss a simple experiment Ramachandran conducted on Tom using a Q-Tip. Ramachandran and his coauthor write that this experiment resulted in finding a complete “map” of Tom’s

phantom hand on the side of his face, a discovery which they call “staggering” (29). This single experiment validated Ramachandran’s earlier work, as well as Pons’s study; according to Ramachandran and Blakeslee, the culmination of such data “may help explain the very existence of phantom limbs” (33).

The third chapter, “Chasing the Phantom,” focuses heavily on MBT itself. Ramachandran and Blakeslee begin by addressing the issues of phantom paralysis; they ask, as Ramachandran and Rogers-Ramachandran did before, if learned paralysis can be, in effect, *unlearned*. This chapter again addresses the problem of phantom pain, and Ramachandran and his coauthor take time to describe this puzzling and frustrating issue. Ramachandran and Blakeslee also explain some new theories for why PLP may occur in the first place. It seems again that Ramachandran is deeply concerned for the well-being of those he treats, and this continued, genuine consideration for their lived experience is another reminder of his pragmatic nature.

In an attempt to better this lived experience, Ramachandran and his coauthor turn again to their argument in support of MBT. They report on some older studies, but some newer ones as well: in one recent study, Ramachandran experimented with a dozen people who had painfully-clenched phantom hands, and after using the mirror therapy half of the patients experienced relief from their PLP (53). Ramachandran and Blakeslee note, as Ramachandran had previously, the “placebo” effect and the power of suggestion (53). This again reveals Ramachandran’s pragmatic attitude: although boasting of positive initial results, the mirror-box should not yet be claimed as a cure for PLP (even though it is certainly a step in the right direction). Instead, he and his coauthor recognize

that other factors may be at work to influence the effectiveness of the therapy.

Ramachandran and Blakeslee describe an experiment that Ramachandran conducted to “test” for the placebo effect. This experiment will be discussed in the coming section, as it demonstrates Ramachandran’s attention to the effects of his rhetoric.

Six years later Ramachandran published *A Brief Tour of Human Consciousness: From Imposter Poodles to Purple Numbers* (2004). Like *Phantoms*, portions of this book were used earlier to show that Ramachandran’s pragmatic attitude influences his writing. Now excerpts will be used to show the continued pragmatic influence under which he operates in the field. The first chapter, titled “A Pain in the Brain,” is the only chapter in this book which focuses on PLP and MBT; therefore, the discussion of Ramachandran’s rhetoric from this work will be somewhat shorter than the others, though it is still an important addition to the overall discussion and analysis. To begin Ramachandran describes, as he has before, several patients who felt sensations on their faces referred to their phantoms (remember Tom, from *Phantoms*). He spends a great deal of time on one patient, Victor, who experienced these referred sensations. Ramachandran explains that when he trickled water down Victor’s face, he “also felt it trickling down his phantom arm;” when Victor raised his arm, he “was amazed to feel the trickle going up his phantom, contrary to the laws of physics” (13).

Ramachandran writes that these observations (combined with the observations and research of others) have led him to believe that the adult brain is highly malleable (15). He makes it clear that no one is quite sure how “body maps can be harnessed in the clinic,” but he does share some examples of how “some of these ideas can be clinically

useful” (15). This quote indicates, again, Ramachandran’s pragmatic temperament. He realizes the cash-value of the idea of this map, and recognizes the potential for its use.

From here, Ramachandran launches into a brief background discussion of phantom limbs, from patients who claim their phantom is “waving goodbye,” to those who report that their phantom is “paralyzed,” as if “in cement” (15). Ramachandran takes time to discuss the concept of “pain” in some depth, comparing acute pain to chronic, and he notes that this “very useful adaptive mechanism” sometimes backfires, becoming a curse rather than an evolutionary gift (17). He reiterates how MBT appears to help patients with clenched or paralyzed phantoms, and that many of the patients who employ the therapy find relief from their symptoms and pain (17). Ramachandran is very much aware of the spooky, if not frustratingly painful, lived experience of the individual with PLP. This again points to a melioristic sense, and shows that Ramachandran is concerned with the effects of his scholarship on the lived experience of actual people.

Ramachandran’s most recent book, *The Tell-Tale Brain* (2011), also contains indications of how a pragmatic temperament has guided both his writing *and* his research. In the “Preface” Ramachandran writes that he often tells his students that medicine imparts an essentially pragmatic attitude on those who practice (xxiii). Ramachandran argues that in medicine, there is no better test for a treatment than the results for the patient; he explains that that “this no-nonsense attitude then spills over into your research as well” (xxiv). These quotations show that Ramachandran not only possesses a pragmatic temperament, but that he recognizes it and explains its practicality to his

students. It is obvious that this influences Ramachandran's research, and it no doubt inspires a pragmatic attitude in his pupils and their clinical work.

Tell-Tale's first chapter, "Phantom Limbs and Plastic Brains," is the only chapter in this work that specifically addresses PLP and MBT. However, from it we learn what initially spurred Ramachandran to study neurology. He explains one patient in particular whose condition was especially intriguing (she laughed when she perceived pain), and how he was drawn to the study of the brain because "there were so many questions left unresolved" (24). After surveying a wide range of disorders, Ramachandran writes that he settled finally on phantom limbs; he explains that all previous attempts to explain the phenomenon were "flaky," and for this reason he "decided to tackle it from a neuroscience perspective" (25). This shows Ramachandran's pragmatic sense by illustrating his desire to use new approaches to find meaning; it also shows, again, his concern for lived experience.

Ramachandran includes a lengthy discussion on several topics he (and I) have covered previously. Ramachandran reiterates the now-strong argument for the malleability of the adult brain, and explains again why it is so significant. He explains that his observations of patients were confirmed using brain-imaging techniques, and that his confirmation "flatly contradicts" the old dogmas (28).

In this chapter Ramachandran again discusses several patients, the conditions surrounding their amputations, and their experiences with MBT. He explains that more patients have now successfully "amputated" their phantom limbs (patient D.S. from the initial article discussed was the first to experience this), and that while this idea might

have once seemed “outlandish,” it has now been replicated by other groups of researchers. It seems that the appeal of MBT has spread to outside scientists, who in turn have conducted their own studies and compiled their own results. Ramachandran notes that this is especially true of Herta Flor, a neuroscientist at the University of Heidelberg (34). He also writes that “the reduction of phantom pain has also been confirmed by Jack Tsao’s group at the Walter Reed Army Medical Center” (34). According to Ramachandran, Tsao and his group conducted a placebo-controlled study of 24 patients (with 16 controls), and eight patients experienced a complete disappearance of their phantom after three weeks (34). The fact that other scientists and medical professionals are now using Ramachandran’s therapy is an important point that will be discussed in the coming section.

We have seen through Ramachandran’s rhetoric (at times augmented by coauthors) the path that his research and argument for MBT has taken. It is evident that a pragmatic temperament influences not only his writing, but his actual field work as well. Now that we have thoroughly set out the artifact (i.e. the rhetoric of Ramachandran in support of MBT) we can apply the method. The following section will look at what each of the maxims demand, and pull references from the text that illustrate Ramachandran’s “compliance” with said demands.

Application of Method

In his 2010 article “What Does Pragmatic Meliorism Mean for Rhetoric?,” Scott Stroud defines and describes four maxims “for doing melioristic rhetorical studies” (55). These four maxims will be applied to the rhetoric of Ramachandran (and coauthors) to

see if it has been melioristic, and if this has positively affected the therapy's use (by Ramachandran and others) and its perceived "effectiveness."

Let's begin with the first maxim: Stroud writes that one must "attend to how 'rhetoric' is being used and what effects on experience this use portends" (55). He explains that meliorism "would demand that rhetorical scholars be clear about which sense of rhetoric they are employing, and more importantly, be clear as to the impact of this sense on their project" (55). They must consider, Stroud writes, that if they are successful, "what will be the impact on lived experience" (55)?

When we apply this concept to Ramachandran's rhetoric, we will certainly find that he has considered the effects of his rhetoric, and he has considered the possible effects on lived experience. Ramachandran's attention to this issue can be demonstrated in his writing in three ways: first, in the way he describes the painful sensations that many amputees experience; secondly, in his recognition of the "placebo" effect and his rhetorical "test" for it; and third, in his discussion of the spreading use of the mirror-box.

Stroud writes in this first maxim that one must consider not only how their rhetoric will affect lived experience, but also *whose* lived experience will be affected (55). Ramachandran clearly acknowledges both points in his writing about PLP and MBT. In their 1996 article "Synaesthesia," Ramachandran and his coauthor excitedly describe their observation of "the first known case of an 'amputation' of a phantom limb!" (382). This "amputation" had an undeniable impact on the lived experience of that patient; although he still felt phantom fingers protruding from the site of the amputation, Ramachandran and his coauthor write that the patient "seemed pleased because his

phantom pain in the elbow, that he used to experience several times a day, had now disappeared along with the elbow” (382). We see that Ramachandran is conscious of both the patient’s reality *prior* to using MBT, as well as how the therapy’s use has changed that individual’s experience with PLP. The *practical consequences* of MBT are of paramount concern and interest for Ramachandran.

Ramachandran’s 1998 article “Consciousness” includes additional indicators that he is concerned with the pain that often accompanies phantom limbs. He explains that “some patients experience excruciatingly painful involuntary clenching spasms in the phantom; they experience their nails digging into the phantom palm and are unable to open the hand voluntarily to relieve the pain” (1853). Other patients experience a phantom that is paralyzed in an awkward and painful position. In *Phantoms*, Ramachandran and his coauthor describe one patient, Philip, who had lost his arm ten years previously in a motorcycle crash and was “desperate” to find relief from his phantom pain. According to Ramachandran and his coauthor, Philip explained that he had “had a terrible pain in [his] phantom elbow, wrist, and fingers,” and that upon interviewing Philip, Ramachandran learned he had been unable to move the phantom *at all* during that decade (47).

Ramachandran and his coauthor write that when Ramachandran administered the therapy to Philip, the patient was initially skeptical; when Ramachandran instructed him to “move your right and left arms simultaneously,” Philip replied: “Oh, I can’t do that ... I can move my right arm but my left arm is frozen” (47). Ramachandran explains that his response was simple: “Okay, but try anyway” (47). Upon his actual trying, Philip

immediately felt both arms moving inside the box, and he exclaimed “This is unbelievable. It’s mind boggling! ... My left arm is plugged in again” (47).

This section indicates again that Ramachandran is deeply aware of the plight of those suffering from PLP, as well as the effects that constant and untreatable pain has on these individuals’ well-being. But he also recognizes that MBT has the potential to change this lived experience for the better, and his rhetoric to both patients and in his writing reflects this. Obviously, Philip cannot know if the therapy will help him if he does not try to use it; Ramachandran recognizes that MBT is a bit “off the wall,” and nonetheless gently encourages the desperate yet reluctant patient. In the end, Ramachandran and his coauthor concede that “it seems extraordinary even to contemplate the possibility that you could use a visual illusion to eliminate pain” (58). Yet they argue that “pain itself is an illusion – constructed entirely in your brain like any other sensory experience,” and for that reason “using one illusion to erase another doesn’t seem very surprising at all” (58).

Ramachandran (with his coauthor) seeks to establish the above “worldview” rhetorically, and by promoting this view in his popular works, Ramachandran is using an essentially pragmatic device. As noted before, pragmatic philosophers such as James recognized that common audiences are more likely to see the “cash-value” of an idea, and clearly Ramachandran recognizes this too. By disseminating his argument to a wider audience, he is attending to the ends of his rhetoric: MBT will only be useful if people are aware of its existence and are compelled to try it, and this can only be achieved at this point through persuasive communication.

Ramachandran's discussion of pain in his book *A Brief Tour* (2004) is even more detailed. He explains the differences between acute and chronic pain, saying the latter (under which PLP is grouped) "evolved to reflexively immobilize the [limb], so letting it rest and remain out of harm's way until fully healed" (17). Ramachandran notes that "ordinarily, pain is a very useful adaptive mechanism – a gift, not a curse," but he qualifies this by writing that "sometimes the mechanism backfires" (17). This discussion is interesting because it indicates that Ramachandran recognizes the evolutionary need for pain, but at the same time understands the terrible effects of a breakdown in the mechanism.

A discussion of PLP and its impact on the lived experience of amputees is evident in each of Ramachandran's works, but perhaps an even more important point is his attention to the placebo effect. His recognition of the influences of rhetoric on the placebo effect is equally important to consider under this first maxim. As early as 1996, Ramachandran (with coauthor Rogers-Ramachandran) realized the placebo effect may be at work in his study. Ramachandran and his coauthor explain that while one patient experienced relief from her clenching spasms, a burning sensation still persisted in her phantom fingers (380).

Ramachandran and his coauthor argue that this "is an important observation for it not only rules out placebo effects, but implies that only some kinds of discomfort may be relieved by the procedure" (380). They note later the "notorious susceptibility of pain to 'placebo' and suggestion," and encourage that future research repeat Ramachandran's experiments on large samples using the double-blind technique (385). Although rhetoric

is not specifically addressed in this example, two things are certain: first, that Ramachandran recognizes the potential for the placebo effect and takes that into consideration in his research and writing; and secondly, the mention of “suggestion” indicates that Ramachandran has an idea regarding the persuasive nature of this concept in such cases.

The most lucid example of Ramachandran’s recognition of the link between rhetoric and the placebo effect is present in his book *Phantoms*. Ramachandran and Blakeslee again note the above sentiment, that pain is susceptible to the power of suggestion and placebo. However, Ramachandran and his coauthor go further, explaining that “perhaps the mere presence of a charismatic expert on phantom limbs is all you need in order to eliminate the pain and it has nothing to do with mirrors” (53). This does not seem to bother Ramachandran; his one goal is to effectively treat his patients, and I believe that he wants the same end result whether that is produced by his charisma or his mirrors (or both). But Ramachandran *did* want to test for the placebo effect, if no other reason than to rule it out; Ramachandran and his coauthor note that until that variable is determined, it will be “difficult to know” if MBT is a cure (53).

At the time, Ramachandran decided to conduct a rhetorical experiment to see how much influence the placebo effect exerting. Ramachandran and his coauthor write that Ramachandran “tested this possibility on one patient by giving him a harmless battery pack that generates an electrical current;” the patient was told that “whenever the spasms and abnormal postures occurred, he was asked to rotate the dial on the unit of his ‘transcutaneous electrical stimulator’ until he began to feel a tingling in his left arm (which was

his good arm)” (53). Ramachandran and Blakeslee explain that Ramachandran “told him that this would immediately restore voluntary movements in the phantom and provide relief from the spasms” and that “the procedure had worked on other patients in his predicament” (53). These quotes provide a definite example of Ramachandran attempting to use rhetoric to elicit a (perhaps unconscious) response from the patient, to affect that patient’s lived experience. As we know from James’s “The Will to Believe,” even a belief that holds the smallest amount of possibility for the individual to whom it is proposed is a live hypothesis, and James claims is this is the beginning of the belief-creating process (187). Creation of and changes in belief affects the reality of the holder, and it is thus possible for mere suggestion *or* outright persuasive tactics to change lived realities.

This experiment did two things: first, it showed that Ramachandran’s rhetoric was not persuasive enough to elicit any physical or neurological responses from the test patient. Ramachandran and his coauthor note that this patient initially “could not wait” to try the electrical stimulation unit; however, after two days he reported back with somewhat less enthusiasm (53). Ramachandran and Blakeslee explain the patient’s complaint: “‘It’s useless,’ he exclaimed. ‘I tried it five times and it just doesn’t work. I turned it up to full strength even though you [Ramachandran] told me not to’” (53). The second thing this experiment did was further justify use of MBT. After the test patient’s ineffective trial with the electrical stimulator, Ramachandran “gave him the mirror to try that same afternoon, and he was able to open his phantom hand instantly;” the “spasms were eliminated and so too was the “digging sensation” (53).

It would have been equally remarkable if Ramachandran's placebo test had "worked;" indeed, I believe he would view *any* potential treatment for PLP as a good thing. By showing that the placebo effect does not seem to be outwardly present in MBT, Ramachandran has attempted to "test out" this potential variable. Although his rhetoric regarding the electrical stimulator did not have any effect, his rhetoric regarding the therapy *has*. Ramachandran's rhetoric may not immediately effect whether or not MBT itself is considered "effective" by traditional standards, but it does seem to have influenced others to employ this procedure with their own patients. This use by others provides a record of success for Ramachandran's rhetoric.

Ramachandran seems to be quite aware that his argument has affected the lived experience of more than just his own PLP patients; he explains in *Tell-Tale* that the research of others using MBT has now replicated his own findings. Ramachandran writes that initially, "the notion that you could amputate a phantom with a mirror seemed outlandish, but it has now been replicated by other groups of researchers" (34). He explains that Herta Flor, a neuroscientist at the University of Heidelberg, is among these researchers; and writes that "the reduction of phantom pain has also been confirmed by Jack Tsao's group at the Walter Reed Army Hospital in Maryland" (34). Ramachandran explains that placebo controls were used in Tsao's study, and that the results were staggering: "the phantom pain vanished after just three weeks in the 8 patients using the mirror," versus the control patients who showed no improvements (34). Even more stunning, when the control patients were switched to MBT, Ramachandran writes that

“they showed the same substantial pain reduction as the original experimental group” (34).

These quotations indicate that Ramachandran is aware of the effects of his rhetoric to this point. He clearly recognizes that others are becoming increasingly interested in the potentials of MBT, and that that increased interest is leading to more patients and more successes. Not only are the *lived experiences* of more patients being improved, the results of these additional studies further bolster Ramachandran’s work. Again, Ramachandran’s rhetoric may not necessarily impact whether or not a patient finds relief using the therapy, but it does have an impact on the larger community and how MBT is perceived. The fact that other scientists and medical professionals have chosen to use this therapy indicates that the perception of it, at least for some, has been positive. Perhaps Flor and Tsao also possess a certain pragmatic attitude, and recognize the cash-value of this idea.

The second maxim that Stroud sets out demands that one “attend to the ends of one’s scholarship,” and that “rhetorical scholars must consider what sort of difference their work will make, if all goes well” (55). He notes that for rhetorical scholarship to be meliorative, it “must have some notion of what effects in actual people and lived experience it ought to affect if it is successful” (55). Simply put, this is the “so what?” question in research. Scott explains that if this rhetoric “merely aims for correctness or descriptive accuracy (‘getting it right’), it is far from meliorative” (55).

There is a very specific example from Ramachandran’s writing that I believe demonstrates this maxim well: Ramachandran writes in *Tell-Tale* that “I often tell my

students [that] medicine gives you a certain breadth of vision while at the same time imparting an intensely pragmatic attitude” (xxiii). Further, he explains that “if your theory is right, your patient gets better. If your theory is wrong – no matter how elegant or convincing it may be – she gets worse or dies” (xxiii-iv). Ramachandran argues that “there is no better test for whether you are on the right track or not” (xxiv). Clearly, these quotes indicate that Ramachandran is not aiming for “correctness” or “descriptive” accuracy; instead, he is working towards that which *seems to work*. For Ramachandran, “correct” is what alleviates the patient’s symptoms, and his conception of the effects of his work on the lived experience of others is evident. Ramachandran recognizes that all that glitters is not gold, and that even shiny medical theories or treatments are meaningless if they fail to explain or treat the condition. Ramachandran notion of “correct” is undoubtedly a sense that drives him to promote the mirror therapy; MBT may not work completely for everyone, but it does work for *some* individuals. While this example was used previously to denote Ramachandran’s pragmatic temperament, it also illustrates how this temperament influences the habits and goals of Ramachandran’s argument.

Stroud’s third maxim states that one must “attend to the entailed means of [one’s] scholarship” (55). He explains, “if you postulate some end as that which ought to be pursued, do you explore ways to reach it?” (55). The answer to this, in regards to Ramachandran, is easy to see: Ramachandran has been working for years to better understand PLP, and the end that he feels ought to be pursued is the increased study of PLP and the “acceptance” of a therapy that appears to treat this condition. He continues

to conduct research, and justifies his area of study throughout his body of work. In their 1996 article, Ramachandran and his coauthor justify their (decidedly pragmatic) study of PLP: they write that “almost no systematic psychophysical work has been done on the patients” (377), and this lack of research gives meaning and importance to Ramachandran’s work. Another example of this is found in Ramachandran’s 1998 article; he writes that while the first clinical description of phantom limbs was offered in 1872, “systematic experimental work on them began only ten years ago (in 1988)” despite hundreds of case studies since that time (1852). This is a point of contention that Ramachandran carries throughout all of his work.

Ramachandran is dismayed at the historical lack of attention given to phantom limbs and those they haunt, yet this is exactly *why* his research is so crucial. His continued research and writing, of both academic articles as well as popular books, indicates that Ramachandran is still actively exploring both PLP and MBT. But this third maxim asks that the scholar do more than explore means to reach the desired end; Stroud explains that “if one’s critical or theoretical writing addresses the way humans experience meaning and communication, does it presume or assume that certain people (say, nonacademic audiences) will be exposed to that writing?” (56).

We can certainly acknowledge that Ramachandran’s writing does address the way humans experience meaning; he usually refers to specific patients, illustrating for the reader the human face and plight of the situation. Ramachandran also describes the lived experience, the reality, of these patients both prior to and after using MBT. The question then remains: does he assume certain nonacademic audiences will be exposed to his

writing? The answer is clearly yes. In *Phantoms*, Ramachandran and his coauthor explain Ramachandran's feelings of obligation to share what he has discovered with the general public. In particular, Ramachandran believes that he owes it "to the taxpayers, who ultimately support my work through grants from the National Institutes of Health" (xi). While this example was used previously to show that Ramachandran understands the concept of cash-value or practical consequences, it now illustrates that Ramachandran's drive for writing is the average citizen. Ramachandran assumes that his popular writing will reach nonacademic audiences because it is written with those audiences specifically in mind: in *Phantoms*, he and coauthor Blakeslee explain in detail the way they have incorporated endnotes and other tools to aid the general reader through the text (xii).

In *A Brief Tour*, Ramachandran explicitly states that his "goal in writing this book has been to make neuroscience – the study of the brain – more accessible to a broad audience, to 'workingmen'" (ix). It cannot be any more evident that Ramachandran not only assumes his writing will reach a general audience, but that he has also taken pains to make sure the information is accessible and intelligible. In Ramachandran's most recent book, *Tell-Tale*, he states that his book "is written in a conversational style for the general audience" (xvi). More importantly, he notes that while he does presume "some degree of interest in science ... and human nature," he does not "presume any sort of formal background or even familiarity" with his previous works (xvi). These examples indicate that Ramachandran has considered his target audience carefully, and understands that many may have very little background (if any) in the areas he discusses. Ramachandran

also realizes that any of his books may be picked up by a *new* reader, and thus he must also keep this in mind as he organizes his writing and argument.

Ramachandran writes about how humans experience meaning, and he clearly assumes (and caters to) the expected presence of a lay audience. Even so, Stroud explains in this third maxim that one's scholarship should directly involve an intervention in everyday life (56). He quotes Argyris (1973), who wrote that "truly melioristic schemes of exploration would explore ways to intervene in a community in order to improve it, and such an intervention ought to have replicable measures of improvement" (56). It is clear by now that both Ramachandran's research and his writing seek to intervene in the PLP community in a positive way; he provides sufficient information for the reader to realize the suffering endured by those with phantom pain, and although he admits that the therapy is not a "proven" effective treatment (per traditional standards), it has been shown to help the *majority* of patients who use it. It should be noted again that Ramachandran also hopes to intervene in the scientific and medical communities by bringing to light the practical usefulness of a therapy that is still unexplained.

I believe there are three measures of Ramachandran's intervention in the PLP community, and these measures also indicate a larger paradigm shift in the scientific and medical communities. The first measure is the amputee participants themselves. For example, in his 1996 study, Ramachandran and his coauthor explain the results of ten patients, writing that "four of the five with painful clenching spasms experienced relief" using the therapy (377). Two patients experienced positive results with some residual discomfort, and Ramachandran and his coauthor happily announce "the first known case

of an ‘amputation’ of a phantom limb!” (382). Here, at the beginning of the intervention, the number of participants is small, but their results are significant.

By contrast, Ramachandran’s 1998 study was nearly twice the size; he studied 18 amputee participants and again reported on their results. *Phantoms* was published that same year, and in it Ramachandran and his coauthor indicate another study of twelve amputees, six of whom experienced relief after using MBT (53). In each additional piece of writing, Ramachandran extends the discussion of older studies by including the results of newer ones. This style makes it easy to see that the number of MBT participants has increased dramatically between the publication of “Synaesthesia” in 1996, and the appearance of Ramachandran’s most current book. In *Tell-Tale* (2011), Ramachandran states that now more patients have successfully “amputated” their phantom limbs using the mirror therapy, and that this has been replicated by other researchers (34).

The spread of MBT to other scientists and medical professionals, as well as its recognition as a possible treatment for other disorders, is the second measure of Ramachandran’s intervention. The previous examples illustrate the growing use of MBT by Ramachandran and his patients, as well as the positive results that use has produced. As noted previously, Ramachandran explains that neuroscientist Herta Flor and physician Jack Tsao both currently use MBT in their practices. According to Ramachandran, Tsao’s study was placebo-controlled and used 24 participants, and remarkably, “the phantom pain vanished after just three weeks in the 8 patients using the mirror” (34).

Ramachandran also explains that “new clinical applications for [mirror therapy] continue to emerge;” he describes complex regional pain syndrome – Type II (CRPS-II),

which “manifests in about 10 percent of stroke victims” and produces “chronic, excruciating pain that is unrelenting and persists indefinitely” (35). Ramachandran notes that he was quite surprised when, in the late 1990s, two research groups found the mirror-box to be effective at treating CRPS-II in the majority of participants (36).

Ramachandran’s speculation on the potential usefulness of this therapy for disorders other than PLP is also indicative of this second measure: the increased exposure of MBT has led not only to its employment by more professionals, but also to increased positive patient results. The increased overall use of MBT has led to new thinking about how it can be applied to other conditions.

The first two measures, the number of actual people using MBT and experiencing relief from their symptoms, and the “spread” of MBT to other professionals and other conditions, both affect the third measure: the bank of data regarding the therapy. The main reason that MBT has not been accepted into the traditional folds of science and medicine is because it has *not been explained*. In 1996, Ramachandran and his coauthor argue that “the procedure certainly should not be regarded as a ‘treatment’ for phantom pain” until more placebo-controlled and blind studies were conducted (385).

Ramachandran and his coauthor clearly recognize at this early point that the therapy needs to undergo rigorous scientific experiments with larger sample sizes before it can be validated. But can MBT be proven via traditional standards? Ramachandran admits freely 15 years later in *Tell-Tale* that “no one has proven the mechanism yet” (34). Because the therapy still has not been sufficiently “proven” in the scientific community, the increased data aids to legitimize MBT in the minds of some academics and many lay people. This

increased data also helps those like Ramachandran better understand PLP and how the therapy works, and may in the end produce sufficient empirical support to be fully accepted.

There is another underlying intervention at work that needs to be highlighted: an overall shift in the way neurologists think about the brain and its workings. The use of MBT by researchers other than Ramachandran represents a small part of this shift. The larger move has been from the old thinking that the adult brain *cannot* form new connections, to the new idea that the brain is *highly* plastic. A good example of this is found in *A Brief Tour*: Ramachandran writes that what he has seen “flatly contradicts [the old] view and suggests there is a tremendous amount of plasticity or malleability even in the adult brain,” and he offers a challenge, saying that “this can be demonstrated in a five-minute experiment on a patient with a phantom limb” (15).

The significance of this shift in thinking is clear; in *Tell-Tale*, Ramachandran explains that “generations of medical students were told that the brain’s trillions of neural connections are laid down in the fetus” (28). He notes that this lack of plasticity was “often used as an excuse to tell patients why they could expect to recover very little function after a brain injury or stroke” (28). Now Ramachandran explains, “our observations have flatly contradicted this dogma by showing, for the first time, that even the basic sensory maps in the adult human brain can change over distances of several centimeters;” he writes that “we were able to use brain-imaging techniques to show directly that our theory was correct” (28).

Ramachandran presents a strong case for why the paradigm shift should continue to progress within broader neurological community; the discovery of the malleability of the brain not only changes the whole game, it also helps to explain the occurrence of PLP and how MBT “works.” This shift within the neurological community also means that those with neurological disorders *can* expect to recover function or eliminate PLP, and that their medical providers will consider the practical usefulness of this newfound knowledge.

Stroud’s fourth and final maxim dictates that one must “attend to the habits one’s scholarship elucidates and inculcates” (56). He explains that this is a partially normative endeavor, “as it involves what sort of communities and individuals we *ought* to cultivate” (56). It has been illustrated that Ramachandran is more open-minded and pragmatic than many in his field, and it is clear that he believes the scientific and medical communities *ought* to be a certain way. He strongly feels that these communities should allow new fields of science to grow and go through the normal processes all fields do. One good example of this can be found in *Phantoms*: Ramachandran and his coauthor explain that he is often forced to defend neurology against the constant question, “when are you brain scientists ever going to come up with a unified theory for how the mind works?” (4). He and his coauthor go on to note Ramachandran’s simple answer: “we are not yet at the stage where we can formulate grand unified theories of the mind and brain,” and that “every science has to go through an initial ‘experiment’ or phenomena-driven stage – in which its practitioners are still discovering the basic laws” (4). In this way,

Ramachandran and his coauthor defend not only his field, but also his approach against some of the strict scientific and medical dogmas.

Ramachandran and his coauthor write that “a tension exists in neurology between those who believe that the most valuable lessons about the brain can be learned from statistical analyses involving large number of patients and those who believe that doing the right experiments on the right patients – even a single patient – can yield much more useful information” (xiii). We know that Ramachandran often uses small sample sizes, and that small samples are regarded in research as less desirable than large, broad samples. Ramachandran and his coauthor defend his use, writing that “it’s fair to say that, in neurology, most of the major discoveries that have withstood the test of time were, in fact, based initially on single-case studies and demonstrations” (xiii). They argue that for sciences in their infancy (such as neurology and psychology), “demonstration-style experiments play an especially important role” (xiv).

Ramachandran would prefer the scientific and medical communities to be more open to new approaches and thinking (especially in young fields like neurology), but it is also obvious that he still values traditional aspects. For example, as we have seen previously, Ramachandran and his coauthor denied calling MBT a “cure” for PLP; they instead demanded that other larger, more meticulously-controlled studies be conducted first (386). The fact that Ramachandran respects and addresses both pragmatic and traditional requirements indicates that he can effectively operate within such a dichotomy.

Stroud explains that meliorists would encourage one to “employ descriptive/empirical methods in explicating and verifying our normative procedures” (56). Ramachandran’s work is both descriptive and empirical. He continues to conduct his own research into PLP and MBT, and closely follows others who do the same. When Ramachandran discusses the methods, controls, and patient results of his studies, he is giving the audience empirical evidence regarding the mirror-box. Ramachandran offers the same type of support when he notes others who have employed the therapy and indicates their results.

Ramachandran and his coauthor Blakeslee use descriptive data to explain why a shift in thinking should occur in the larger scientific and medical communities; we saw this just now when he and his coauthor discussed the “tension that exists in neurology” (xiii). Ramachandran and his coauthor effectively describe this tension, and then provide reasons why it should not exist. As noted previously, Ramachandran and his coauthor argue that in neurology, “most of the major discoveries that have withstood the test of time were ... based initially on single-case studies and demonstrations” (xiii). In this way, they defend neurology by providing historical examples of the field’s true “roots.”

Conclusions

The first section revealed that Ramachandran possesses and encourages a decidedly pragmatic temperament, and that this attitude affects his research and his rhetoric. Ramachandran holds to the Jamesian concept of the “cash-value” of ideas and knowledge, and his popular works indicate that Ramachandran uses the essentially pragmatic device of disseminating novel ideas to general audiences. His pragmatic

attitude is likely the cause of him adopting, and successfully using, rhetoric that is both persuasive and melioristic.

We can see from the analysis that Ramachandran's rhetoric satisfies all four of Stroud's maxims, and it is for this reason that we can conclude his rhetoric is truly melioristic. What is even more impressive is that his rhetoric also adheres closely to the multiple small specifications within each maxim. For example, maxim two explains that scholars "must consider what sort of difference their work will make, if all goes well," but it also demands that the desired end must be something other than "correctness or descriptive accuracy" (Stroud 55). As we saw, the samples of Ramachandran's writing provided sufficient evidence to show that his work and rhetoric meet both requirements.

Stroud's method is meant to be used to *guide* rhetorical scholarship, but clearly it has been used herein to analyze *existing* rhetoric regarding a specific topic. This method has been successfully proven useful for determining the meliorism of Ramachandran's rhetoric, as well as determining the persuasive effects of melioristic arguments that promote positive and pragmatic changes.

CHAPTER V: CONCLUSION

In the previous chapter Stroud's method was applied to Ramachandran's rhetoric. The analysis resulted in the determination that his rhetoric *had* succeeded in creating melioristic, thus pragmatic, changes. This chapter will serve as a point of reflection over the various benefits and limitations of this study. It will develop in three parts, starting first by returning to the analysis just conducted. I will focus on the significance of Ramachandran's success in persuading others to consider, research, and adopt MBT even in the absence of traditional measures of proof. Second, I will assess the strengths and weaknesses of the component parts of my research: Stroud's method and my analysis. Third, I will conclude by suggesting avenues for future research. Let us begin by turning again to what the research and analysis illustrate.

We now understand that the issue of PLP has existed for centuries, and that hundreds of case studies have been done since Weir-Mitchell's description in 1872. However, Ramachandran and his coauthor wrote in the mid-1990s that up until that point, "almost no systematic psychophysical work has been done with [PLP] patients" (Ramachandran & Rogers-Ramachandran 377). Ramachandran's work over the past two decades with PLP patients and the development of his revolutionary MBT has produced initially positive anecdotal successes. The majority of patients who use the therapy find relief from their symptoms, and more amputees have now fully "amputated" their phantom limbs. These observations have now been supported by others. It seems that one must dislocate the psychological, as well as physical, limb to truly eliminate its presence.

The body of data regarding PLP and MBT continues to grow with each new patient and each additional study. However, this growing body of research has not yet provided the answer for *how* and *why* the mirror-box seems to work. In short, Ramachandran's novel therapy is not widely supported by the scientific and medical communities because it fails to provide for a traditional measure of proof. A scientist and a pragmatist evermore, Ramachandran freely admits in his latest book that "no one has proven the mechanism yet" (*Tell-Tale* 34).

That being said, a lack of *widespread* support is not the same as a lack of *support*. Although there is no concrete evidence for *why* it works, others are beginning to study and use the therapy because it *does* work. Ramachandran, of course, continues to conduct studies and administer MBT to his own patients. But as this thesis shows, other scientists and physicians are now exploring the possibilities of MBT on patients with phantom limbs and other mysterious conditions. My analysis provides a plausible reason for why others are willing to study and adopt Ramachandran's therapy: the melioristic nature of his rhetoric. Ramachandran is one of the most respected and well-liked individuals in his field, and he is one of that area's leading minds. We have seen that he is highly capable of communicating to both peers and popular audiences, and he has demonstrated no other reason for promoting MBT other than the clear fact that it aids those who are haunted by PLP. Ramachandran's clear drive and desire to positively change the lived experience of others has, as a result, persuaded some peers to endorse and use the therapy themselves. This persuasion has occurred with the understanding that while there is no proof, *further* exploration may lead to the scientific explanation of MBT.

Now that we understand the significance of this study, we can begin to assess the merits of its component parts. First I want to look at Stroud's method, since presented challenges that were positive and negative; both stemmed from the same reason. Stroud's method is as novel as the therapy it was used to examine. Published in 2010, Stroud's article and method have only accumulated one critical response (by Porrovecchio that same year). As Porrovecchio explains, his concern lies in Stroud's assumption that both pragmatism and rhetoric can be "isolated and explained," and that "the merger will make sense in terms of practice for both" (62). Stroud's contextual approach to the definitions of pragmatism and rhetoric could prove problematic. Even so, there is an answer to this criticism. Any researcher who chooses to use Stroud's method must be cognizant of the minute nuances attached to each term, as well as be explicit in explaining how they are defined and related. The crucial connecting term in Stroud's work, as well as in this thesis, is *meliorism*. Rhetoric that is persuasive promotes positive changes that can be viewed, in consequence, as pragmatic. The relationship between rhetoric and philosophy may always remain complicated. However, that is not a sufficient reason *not* to establish a link where the end result is a productive addition to the tools for rhetorical criticism.

One benefit to using this method is that it adds to the overall body and knowledge base regarding rhetoric and rhetorical criticism. The method itself, as noted before, is new, and therefore produces results that are different from methods used previously. Because Stroud's method attempts to merge rhetoric and pragmatism, it is also interdisciplinary. Thus, it helps to explain and criticize rhetoric from multiple viewpoints. In this way, the use of this method benefits the general field of rhetoric because it moves

beyond some of the traditional approaches to criticism. We are able to glean new data and new insight as a result.

As with Stroud's method, my approach to rhetorical criticism has limitations and benefits. The clearest limitation is my use of Stroud's method as a means for *assessing* rhetoric: it was initially designed to create, not criticize, melioristic rhetoric. In this thesis, it was used to analyze *existing* rhetoric. This limitation is not uncommon in acts of rhetorical criticism, and has persisted since the origins of the term *rhetoric* itself. Aristotle's famous definition suggested that one should be able to comprehend. His *Rhetoric* suggested how such comprehension could be used to create persuasive messages. Those who could both comprehend and craft persuasion also have the necessary skills to criticize acts of rhetoric.

Stroud provides a response to this limitation that also suggests the strengths of using his novel method for rhetorical criticism. He argues that the act of criticism is, or should be, *melioristic*; that criticism is, in and of itself, *rhetoric*. Porrovecchio criticized Stroud for merely providing an abstraction of what pragmatic rhetoric would look like (the theory stage), but my use here and the rhetoric of Ramachandran illustrate how such melioristic rhetoric operates in practice (the endeavor stage). Simply put, if my act of criticism promotes a new way of viewing rhetoric (and pragmatism), I will have had a positive impact on the field of communication studies. Further, my thesis has shown that the effects of Ramachandran's rhetoric had *practical consequences* that positively impacted the *lived experience* of patients and scientists alike.

Another strength of this study is my coverage of most, if not all, of the major works created by Ramachandran in working to promote MBT. Most of his academic works were available through the university database, and I was easily able to find and order his books through the Amazon website. The timing of my study was quite fortuitous. There has been more attention paid to Ramachandran and his work over the past several years in popular publications. His 1998 book *Phantoms* with Blakeslee was a *New York Times* bestseller and was translated into nine languages (Kamma). His most recent book, *The Tell-Tale Brain*, was just published in late 2011. Last year, *Time* magazine named Ramachandran as one of their 100 most influential people of 2011, calling him the “Brain Mapper” (Insel). Due to the availability of material, I was able to not only build a solid context for Ramachandran’s rhetoric, but also present a clear artifact composed of his popular and scientific literature.

I have arrived at the point where I must end, but before I do, I would like to point to avenues for future research. I believe there are many potential avenues for future work with Stroud’s method. The very idea of studying rhetoric to determine if it is melioristic suggests a positive and productive revision to the traditional approaches to rhetoric and criticism thereof. It is one thing to issue words and persuade someone. It is another thing entirely to suggest that an act of written or spoken discourse improved the conditions under which humans operate and function. Now, more than ever, we are bombarded with advertisements and arguments, and while we find some persuasive, we feel others are not. Stroud’s method works as a guide for determining *how* they are persuasive, versus *why* they are. It would be worth looking into two broad arenas for possible applications of this

method. The first is one I have already touched on: science and medicine. One could continue to study *how* melioristic rhetoric is used and useful for spreading the argument and influence of novel treatments such as MBT. Are there other scientist-turned-rhetoricians who have used this approach? What has been the outcome? Or perhaps a future scholar could examine situations where melioristic rhetoric would be useful and preferred. Are there treatments or concepts that could have potentially-positive practical consequences, except that they are lacking a catalyst such as Ramachandran? These are all questions that one might ask to begin determining possible avenues of study in an area similar to mine.

The second arena that could be explored using this method is the political front. It has been said that the presidential campaign of 2012 will be the nastiest display of opponent-bashing we have ever seen. While this hyperbole is born of immediacy, it does not undercut the wretched edge to current political campaigns. This constant flow of rhetoric has, I believe, a negative impact on the overall psyche of the public regarding our process of government. What impact would a partially or consistently melioristic approach produce? It would be interesting to use Stroud's method to *create* hypothetical or real political rhetoric that is melioristic, persuasive, and pragmatic. It would be equally compelling to analyze the rhetoric of *current* political figures to see how melioristic their messages are. I think the results of such a study would be simultaneously fascinating and disheartening; often the shiny exterior of an individual's rhetoric masks what deeper analysis uncovers. I suspect that much political rhetoric is partially melioristic, but I doubt that much is truly so.

There is no deeper agenda to be found in Ramachandran's rhetoric. For him, the message is simple: the mirror therapy *does* work. It does not matter *how* or *why*; the amputee with PLP certainly does not care about such details. All that matters to Ramachandran and those with PLP is that MBT alleviates those haunting and terribly painful sensations. And all that matters now is that MBT continues to be studied and used. Its potential to *positively* change the lived experience of those who live in constant pain is what demands our attention. The recognition of rhetoric's ability to impact lived experience and have practical consequences is equally compelling and exciting; it is as worthy of future endeavors as Ramachandran's revolutionary therapy.

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