I, Elizabeth Sweeney, hereby submit this original work as part of the requirements for the degree of:

Master of Arts

in Sociology

It is entitled:

Defining Reality: How Biomedical Researchers Determine the Existence of Pain

Student Signature: Elizabeth Sweeney

This work and its defense approved by:

Committee Chair: Jennifer Malat, PhD
                Jennifer Malat, PhD
                Kelly Moore, PhD
                Kelly Moore, PhD
                Magdalena Szafiarski, PhD
                Magdalena Szafiarski, PhD
Defining Reality: How Biomedical Researchers Determine the Existence of Pain

A thesis submitted to the
Graduate School
of the University of Cincinnati
in partial fulfillment of the
requirements for the degree of

Master of Arts

in the Department of Sociology
of the College of Arts and Sciences

by

Elizabeth M. Sweeney

B.A. University of Nebraska-Lincoln
December 1992

Committee Chair: Jennifer Malat, PhD.
Abstract

Chronic pain challenges the traditional construction of pain and illness, which dictates that an illness or pain is “normal” if its duration is brief and its effect is acute. The diagnosis of illness, conducted under the auspices of the scientific authority of biomedicine, consists of the examination and evaluation of the place in which illness resides, the physical body. As such, this examination constitutes a process that ultimately adjudicates the validity of an illness and, as such, the validity of its sufferer. Biomedicine relies on a Foucaultian model for the construction of illness, a disembodied framework that is applied to the examination of illness. Under this guise, medical and scientific institutions treat disease as a separate entity from the body and the body as a distinct entity from the person occupying it, thereby establishing a distinction between the “sign” and the “symptom.”

As indicated by the extant sociological inquiry on this topic, it is this paradigm of disease that is responsible for the delegitimation of any illness for which there are no empirical pathologies or signs. Such illnesses have been identified as “contested” by social scientists and include Chronic Fatigue Syndrome, Fibromyalgia, and chronic pain. Given the higher frequency of the experience of chronic pain within the total population, this condition is of particular interest. Previous sociological research has examined the social construction of pain from the micro level perspective of the patient as well as that of the physician. Alternatively, sociological inquiry into the biomedical framework within which the construct of pain resides – that of empirically-based medical research, as constituted in peer-reviewed scientific journals – has been minimal. This study examines those publications, utilizing the methodology of content and textual analysis to determine how the condition of chronic pain is constructed within and by the field of biomedicine.

As asserted by Eccleston et al., the inability to identify the source of pain challenges the very foundations of Western medicine as being “scientific, powerful, technical, and efficient” (p. 706). With this research and analysis, I ultimately seek to improve our understanding of the ways in which biomedical researchers validate the existence of a condition that is so nebulous and seemingly unexplainable. I argue that this biomedical enigma threatens the very foundation upon which biomedicine is constructed and as a result, the foundation, validation, and legitimation of biopower; the strategic maneuver of delegitimation is subsequently used to dismantle this potential threat. Thus, it is critical to examine further the role and importance of power in the construction of chronic pain.
Acknowledgements

I am forever indebted to my committee chair, Dr. Kelly Moore. For all of my confidence in expressing myself via the written word, I could never adequately express the value of her wisdom, sociological expertise, patience, gentle and empathic guidance, and tireless efforts in reading, rereading, and carefully examining and evaluating my research and writing of this final product. But even more amazing and valuable was her passion for this research topic, demonstrated throughout the process, which in turn enhanced my own passion and drive to increase our sociological understanding of such a complex and nebulous phenomenon. My ideas for this thesis would not have been fully developed without her invaluable guidance and input.

I would also like to thank my other committee member, Dr. Jennifer Malat, for her insights and guidance throughout the research process and for challenging my ideas. I am also very thankful to Dr. Magda Szafarski for her efforts as the reader for the defense. Her expertise in public health provided another important perspective on my research. The thought-provoking insights, comments, and questions presented during the defense by all of the committee members provided different understandings of and perspectives on the sociological import of this research.

I am extremely fortunate to have been blessed with the most generous, kind, understanding, and loving parents. Their enduring, unconditional love and support, and especially my Mom’s ability to make me laugh even when I was down during this long and arduous process kept me grounded and strengthened my resolve.

Finally, none of this would have been possible without the love and support of my caring, giving, and sweet husband, Dan. He kindly tolerated months and months of my being confined to my office, having to do most of the housework, and having to listen endlessly to my thoughts, ideas, anxieties, and frustrations. He was also always willing to share his own thoughts and
expertise on my research; his own unique scientific perspective enhanced my research. And I would be remiss without thanking my favorite research assistants, Ella and Prometheus, our beloved dog and cat, respectively. Their constant companionship, affection, and unconditional love in the darkest hours of the night sustained me.
# Table of Contents

Introduction........................................................................................................................................1

Theoretical Background and Framework..........................................................................................3

  * Sociological Discourse on Biomedicine, Pain, and Illness .........................................................3
  * A Note about Contested Illnesses ..............................................................................................5
  * Biomedicine Applied Via a Reductionist, Positivist Paradigm ..................................................8
  * Evolution of the Sign-Over-Symptom Discourse ......................................................................10
  * Delegitimation of Unexplained and Contested Illnesses ............................................................12
  * Invalidating the Subjective Experience of Pain and Illness ......................................................14
  * The Case of Chronic Pain ...........................................................................................................19
  * Pain as a Medical Category of Illness .........................................................................................22
  * Scientific Publication as Official Symbol of Scientific Authority ..............................................24
  * The Present Study ......................................................................................................................25

Data Collection and Selection and Content Analysis ....................................................................25

Findings: The Positivist Model of Validating the Existence of Pain - Objectify, Specify, Quantify, and the Identification of Visible Signs .........................................................................................29

  * Overview of Findings .................................................................................................................29
  * How to Measure Pain and Suffering: Scales, Thresholds, and Instruments .................................32
  * Measuring Pain and Suffering: How researchers simulate pain to investigate pain mechanisms, utilize mechanical instruments to assess those mechanisms, and employ animals as substitutes for human subjects .........................................................................................................................33

  * Measuring the existence of pain via experimental pain stimuli .................................................33
  * Identification of the sign to determine or understand the mechanisms of pain ..........................40
Measuring atypical pain responses as signals of pathology………………..42
Survey-Based Measurements of Pain………………………………………45
The Measurement of “Real” Pain: How Researchers Quantify Extant Pain in Human Sufferers………………………………………………………………………………..51
A study of pain that emphasizes qualitative rather than quantitative Assessments……………………………………………………………………..57
Turning the tables – focusing on the practitioners…………………………59
The Biological Property of Sex as a Defining Variable in the Study of Pain.61
Discussion………………………………………………………………………………….64
Bibliography…………………………………………………………………………………..76
Appendix A: Pain Themes & Patterns Matrix
Appendix B: List of Articles in Order from Matrix
Appendix C: Pain Rating Scales
Appendix D: McGill Pain Questionnaire
Appendix E: Neuropathic Pain Symptom Inventory
Appendix F: Pain Catastrophizing Scale
Appendix G: Medical Outcomes Study
Chronic pain challenges the standard construction of pain and illness, which dictates that an illness or pain is “normal” if its duration is brief, and its effect is acute. As a virtually universal human experience, pain functions as the most readily apparent sign that some type of physical injury has occurred, thereby prompting the potential need for medical attention on some level. In spite of its universality and apparent simplicity of function, the concept of pain is itself engulfed in a complex scientific discourse regarding how to perceive, measure, and validate the existence of what is ultimately a subjective experience. As a new conceptual category, chronic pain adds another layer to this discourse by altering the classification of pain as a symptom to that of being considered a medical condition itself. Whereas acute pain is treated as the body’s “normal” response to tissue damage, pain lasting longer than three months is generally defined by medical practitioners and researchers in the U.S. as chronic, and as representing a doubly “abnormal” state: being in pain is “abnormal,” as compared to being pain-free, but chronic pain is doubly so, for it goes beyond the standard temporal time frame for “normal” pain, particularly if no physical evidence of its source has been detected. This characterization of chronic pain is consistent with the characteristics of a category of medical conditions referred to by scholars of science and medicine as a “contested illness.” Contested illnesses, addressed more thoroughly later in this paper, are those that defy standard biomedical explanation; in addition to chronic pain, they include such conditions as Chronic Fatigue Syndrome (CFS), fibromyalgia, and Gulf War-related illness.

This “standard” construction of pain and illness is the product of biomedicine – that contemporary model of clinical medicine distinguished by its application of the principles of the natural sciences, particularly the biological and physiological sciences, to medicine. Under the auspices of the tacit scientific authority of biomedicine, clinical researchers, physicians, and
others assess the validity of illness, an assessment that ultimately relies on an epistemological conceptualization of medical science as the omniscient revelator of pure, objective truth. As this statement implies, in modern medicine, the diagnosis of illness consists of the examination and evaluation of the physical body, the place where modern biomedicine presumes that illness resides. This process in turn serves as the ultimate adjudication of the validity of that illness, and as such, the validity of its sufferer. As a medical condition that challenges these standards of validity, chronic pain serves as a particularly instructive exemplar of the often problematic framing of such contested illnesses by the biomedical community; the outcome of such framing is often the unequivocal delegitimation of these conditions. It is this problematic and subsequently controversial biomedical construction of pain, and particularly chronic pain, that serves as the theoretical axis of this study.

The scientific discourses in which the biomedical construction of pain occur are predominantly manifested in the publication of biomedical research. Scientific publications serve as the foundation of this construction in the sense that the publication of research is considered the ultimate validation of that research and its findings. Indeed, the publication of research represents one of the most competitive domains of biomedical science – of any science for that matter. A research institution’s credibility and authoritative status are often measured in terms of the number of publications it has produced and even more importantly, the frequency with which its publications have been cited by other publications. (Strathern 2000; Kleinman and Vallas 2001; Merton 1968; Latour and Woolgar [1979] 1986). The high esteem and prestige associated with published research originates from its application to the very practice of medicine: it is from these publications that the practice of medicine derives its instructions, so to speak, for how to practice. And it is these publications within which the fundamental discourses
concerning the biomedical framework of chronic pain and other contested illnesses are then circulated to clinicians, students, and physicians studying pain. Ultimately then, scientific research functions as the manifestation of the defining vision of biomedicine; its publication is regarded as presenting biomedical evidence of the existence or nonexistence of a pain condition. Given the significance of publications as instructions in the practice of medicine, it is these publications that provide the empirical data for this paper.

To advance sociological insight into the biomedical construction of chronic pain, in this study biomedical research specifically published in the scientific research journal *Pain* is used to examine how empirically-based medical research conceptualizes, evaluates, and constructs the phenomenon of pain, particularly that of chronic pain. Using qualitative methodology, I conduct content and textual analyses of the data to in turn determine if any discernible patterns or significant differences exist in terms of how pain is framed within and by the biomedical community. I also analyze the specific dimensions of pain that predominantly serve as the focus of this research, reflecting the greater value of these dimensions for the construction of pain by this research community. These dimensions consist of the type of pain, including its location on the body; the etiology of the pain; the nature of its etiology in terms of physiological or psychological; the duration of the pain – acute or chronic; the methods used to measure pain; and the examination of signs presumably associated with pain. Furthermore, I examine how this construction varies or coheres in terms of the legitimation or delegitimation of this condition.

**THEORETICAL BACKGROUND & FRAMEWORK**

*Sociological Discourse on Biomedicine, Pain, And Illness*

The social construction of health and illness has been the subject of a number of sociological analyses. Many of these analyses have concluded that the various manifestations of
this construction have had a significantly negative impact on those who are unfortunate enough to suffer from illness. This is especially true of those who suffer from “contested” illnesses (Dumit 2006; Raheim and Haland 2006; Banks and Prior 2001; Werner and Malterud 2003; Shriver and Waskul 2006; Ware 1992; Brown and Mikkelsen [1990] 1997). As the following review of sociological literature reveals, sociological discourse and empirical research examines this phenomenon from the perspectives of biomedicine, physicians, alternative practitioners, and patients.

The consideration of these various perspectives yields four major conclusions. First, the construction of health and illness is a complex social process that is inherently sensitive to cultural influence, among a number of other dynamics despite the fact that medicine, as a science, is falsely presented as an inherently unbiased, higher authority (Zola 1966). From this perspective, the achievements of modern science are exalted and deemed to definitively advance states of knowledge and the quest for an absolute “truth,” the existence of which is remarkably unquestioned at least within the confines of biomedicine. The impact of such a paradigm is significant in terms of the study and treatment of chronic pain and other unexplained illnesses. The second principal conclusion of the literature is that the study and practice of biomedicine is dominated by a reductionist and positivist theoretical paradigm (Foucault [1963] 1994). Positivism in this context refers to a philosophical framework that requires statements of knowledge or ideas to be verified by the human senses and based in facts, experience, and practice rather than abstract ideas or theoretical concepts. In a similar manner to the first paradigm, this one also informs the social processes that define health and illness. The third conclusion concerns those conditions that do not conform to the contemporary, Western model of biomedicine. In this model, a condition is only considered legitimate if its etiology is
manifested in physically observable signs (Foucault [1963] 1994). In addition to these findings, there are two dimensions that command particular consideration in this review – the notion of pain as a medical category and the distinctive methods social science scholars have used to study pain.

A Note about Contested Illnesses

As noted above, chronic pain is often categorized as a contested illness; given the specific sociological relevance of this category of illness in terms of the social construction of illness, it has garnered much consideration and analysis in the social science literature. Therefore, it is critical to first present a brief overview of this category of illness. One article that captures many of the social dimensions of contested illness is a 2001 qualitative study concerning Chronic Fatigue Syndrome (CFS) (Banks and Prior). In this study of doctor-patient interactions in the context of a clinical setting specifically designed to treat CFS patients, Jonathan Banks and Lindsay Prior characterize an illness as contested if it serves as the subject of much debate within and without the medical community in terms of its validity as a “bodily pathology” (2001:12). That is, the bodily causes of such illnesses are ambiguous and surrounded by controversy, hence the title of “contested.” In fact, as Banks and Prior observe, the consultations between doctor and patient often resemble a political contest about the nature and validity of the condition, “in which the demarcation lines between mind and body are continually assessed and re-defined, and the tenets of `biomedicine’ are constantly challenged” (2001:11). They further contend that this essentially ideological conflict is the reification of a larger political struggle between physician groups and patient groups regarding the working definition of CFS (Banks and Prior 2001). Aside from demonstrating the dynamics of contested illnesses, Banks and Prior also introduce two assertions that support the theoretical basis of the present study: 1) the struggle for the
legitimation of a condition by those who suffer from it is essentially political in terms of which side of the dichotomous biomedical paradigm has the power to construct the illness; and 2) this struggle constantly challenges the very tenets of biomedicine (2001).

Although Banks and Prior focus on the conflict between physician and patient (2001), it is also important to note that these illnesses, and more specifically the etiologies of these illnesses, are just as often contested within the very realms of science and medicine that are fundamentally responsible for their validation. As articulated by Irving Zola in 1975, the field of medicine is surrounded by “an aura of objectivity and respectability” (p. 84), wherein objectivity is defined as the quality of only considering that which has “actual existence or reality” and that which can be perceived by all, and being unbiased or otherwise independent of emotions and individual thought (Dictionary.com 2009). This aura of objectivity is positioned as being superior to its antithesis, subjectivity, which is defined as being characteristic of the individual and existing in the mind, such that reality exists as it is perceived in the mind of the subject (Zola 1975). As such, the findings and subsequent pronouncements of scientific “proof” that often characterize biomedical scholarship are granted greater validity and import than might be justified among medical practitioners. Given that one of the goals of science is to establish the bounds of the normal and typical, the scientifically-based construction of pain and illness subsequently provides fertile ground for the development of standards and definitions of what is considered normal or abnormal, legitimate or not legitimate, in terms of the symptoms presented. These scientific pronouncements of biomedicine, misleadingly presented as objectively-determined truths about the purely physical features of the body, therefore act as powerful judgments of illness. In turn, this pristine framing of medicine falsely grants greater validity to moral claims regarding illness (Zola 1975). That is, the framing of medicine as an objective
science of the body acts as a cloak for the claims of biomedical researchers, clinicians, and physicians that invoke morality, for if the science of medicine supports the claim, it must be “true.” The application of this paradigm to the practice of medicine is responsible for the following beliefs and attitudes of clinicians and physicians: that biomedical claims must be accepted as authoritative and accurate assessments of that which is legitimate or not legitimate in terms of the illnesses and symptoms presented. Although medical practitioners operate within the confines of this biomedical paradigm as a matter of their medical training and indoctrination into the field, it is clear that we do not have empirical evidence of the ways in which biomedical research, as manifested in scientific publications, may directly influence or guide the actual, everyday practice of medicine and the nuances of the doctor-patient interaction. Indeed, the biomedical discourses circulated among clinicians, researchers, and physicians only serve as one set of ingredients in the examination and evaluation of patients. Thus, my discussion of this dynamic consists of a theoretical exercise in the possible implications that this work in the lab may have on doctors’ work in the clinic.

In his seminal article “In the Name of Health and Illness: On Some Socio-Political Consequences of Medical Influence,” Zola argues that the social legitimation of medical expertise creates the appearance that medical judgments are “morally neutral” (1975:86). The practice of medicine constitutes the application of science to diagnose, treat, and ultimately heal illness, injury, or disease. Because it is viewed as a science, medicine is inherently considered an authority. As indicated above, the specious “guise of objective, scientific data” that characterizes the application of medical science cultivates an atmosphere in which moral and political pronouncements are fundamentally deemed valid and neutral (Zola 1975:84). This illusion of neutrality creates an imbalance of power between the representatives of biomedicine, clinicians
and physicians, and its subjects, the patients. Protected by the veil of a pure and unbiased
assessment of disease and illness, and empowered by legal and financial support, biomedical
practitioners express opinions and views that are in fact morally charged, not morally neutral
(Zola 1975).

Indeed, Zola challenges the supposed neutrality of the institution of biomedicine by
arguing that it is the “exercise of physicians’ personal values and morality” that is being
practiced, not pure “medicine” (1975:84). Zola further explains that by using medical and
psychological explanations for various social problems, or what he calls the “medical model” of
social problems, biomedical experts locate the source of troubles and their treatment within the
individual (1975). To do so is to necessarily prevent any given problem from being considered a
social problem, thereby precluding any responsibility for society to address the problem. To
illuminate this phenomenon, Zola provides several examples, one of which concerns the
development of public policy for the poor and disadvantaged. He quotes an administrator of
public welfare who stated that policy should be prioritized to address the “social and emotional
problems” precipitated by “economic dependency” (1975:85). As Zola indicates, such an
approach effectively ignores the possible socio-political or economic causes of this economic
dependency to instead focus only on its individual causes, namely, a predilection to
“dependence” (1975). Zola concludes that through this process, medicine is achieving “certain
political aims” as well as concealing the moralistic nature of its adjudication (1975:86).

**Biomedicine Applied Via a Reductionist, Positivist Paradigm**

Other theories of modern medicine build on Zola’s claims by asserting that modern
medicine not only claims a veil of objectivity, but treats illnesses as properties of the body, and
sees “the body as a discrete entity separate from the person occupying it” (Morello-Frosch et al.,
In this sense, an illness or condition is examined independent of its location in the body, and therefore as independent from the person in whose body the illness resides (Foucault [1963]1994). Thus, it is examined and evaluated as an isolated phenomenon essentially immune from any influence that may be presented by the body or the person. In other words, the condition is fundamentally examined out of social context. This conceptualization of illness contrasts with other models of medicine that consider conditions of health and illness as constitutive of the whole person; in other words, the person and the illness and the body are not treated as separate entities but instead as interdependent components of the whole. Accordingly, such a paradigm approaches illness in a more holistic manner. The insular approach to illness as represented by modern biomedicine is not necessarily applied consistently throughout the study and practice of medicine. Instead, in a rather paradoxical sense, the social characteristics of individuals, such as class, race, and gender, are often used by clinicians and physicians to form judgments about the condition of the physical body as well as the moral worth of the individual (Zola 1966). Therein lies one example of the exigency and complexity of the biomedical paradigm: the reductionist and positivist dimensions of the biomedical construction of illness are often contradictory and problematic in their application. The research presented here examines one prototype of this insular model of illness, in which the condition of pain, and in particular, chronic pain serves as the focal point.

The reductionist and positivist dimensions of biomedicine are further explored in Foucault’s *The Birth of the Clinic*, first published in 1963. Foucault’s examination and analysis ([1963] 1994) of the historical transformation of medicine from an art form to what is essentially considered a science conveys a theoretical framework that ultimately foreshadows Zola’s arguments (1975). The foundation of Foucault’s theory is that biomedicine not only treats
disease as a separate entity from the body, but it simultaneously treats the body as a detached entity from the person occupying it. The field of medicine further established a distinction between the “sign” and the “symptom” in the late 1700s (Foucault [1963] 1994). A sign refers to the observable, physical evidence of pathology (which here refers to the characteristics or signs of illness as opposed to the “normal” characteristics of a healthy body), such as an organ that has been damaged by disease or injury. In contrast, a symptom is simply the patient’s claim as to what may be pathological. By the late 1700s, the sign had taken precedence over the symptom in diagnosing illness, and the doctor, not the patient, became the authority on what counted as illness (Foucault [1963] 1994). Symptoms, then, became subject to doubt and suspicion and could only be corroborated by physical evidence – the sign.

Evolution of the Sign-Over-Symptom Discourse

Over time, Foucault argues, the language of signs became the means by which to diagnosis illness, such that the “discourse of ‘sign without symptom’” became the overarching paradigm for the practice of medicine (Eccleston, Williams, and Stainton Rogers 1997:700). It produced a discourse in the sense that verbal and written consideration, examination, and discussion of illness was predicated on the conviction that illness is only real if it reveals itself through pathology. Therefore, discussion of illness soon became organized around signs, not patient-described symptoms. In this paradigm, the body is examined for signs of illness, virtually exclusive of any consideration of the patient and his or her symptoms; any consideration of symptoms has been reduced to possible signs that such symptoms might suggest to the clinician. This construction of illness inherently suggests that the presence of symptoms without an observable sign is necessarily problematic, that is, suggestive of a deviant form. Because symptoms are constructed as mere claims that must be corroborated with physical
evidence, the absence of a sign implies that the symptoms are imagined or otherwise nonexistent (Eccleston et al. 1997). In the case of chronic pain, for example, a patient who presents with chronic pain for which no identifiable sign can be found is summarily dismissed as, among many other possibilities, a “malingering” or as suffering from a psychosomatic or other type of mental illness. It is this dimension of the positivist framing of illness by biomedicine that isolates pain as an uncertain and ambiguous medical category, a category that blurs the boundaries between signs and symptoms, objective and subjective, and that defies that which is knowable and measurable.

The evolution of the sign-over-symptom discourse contrasts with Zola’s paradigm of the construction of illness (1975). Rather than treating the body as separate from the illness, and the body as separate from the person, Zola argues that medicine implicates the individual as the source of any given problem, including social problems. This implication thereby permits the fulfillment of various political objectives. For example, Zola cites the United States Army’s revision of its policy regarding alcoholism: it now considers alcoholism to be a “treatable disease” (1975:83). This change meant that individuals who had previously been considered “unfit” to serve in the military due to alcoholism were immediately allowed to do so. Prior to this revision of policy, alcoholism had been classified as a “psychiatric impairment,” and as such was “one of the most common methods of disqualification and discharge” from the military (Zola 1975:83). The fact that this revision occurred in 1971, at the height of one of the most unpopular wars – the Vietnam War, provides particularly compelling support for Zola’s paradigm as follows: the abrupt and definitive revision of a condition’s medical classification resulted in the immediate qualification of a previously disqualified group of potential soldiers during a war in which few wanted to serve; this action demonstrates the political objectives
served by a medical diagnosis that, in this context, conveniently removes the implication on the individual, in the sense that the classification of alcoholism as a “disease” rather than a psychiatric impairment connoted a physiological rather than psychological origin.

Although the means by which illness is constructed by biomedicine may differ in the views of Zola and Foucault, their conclusions about the outcomes are similar: biomedicine has been falsely granted the scientific authority to determine what an illness is and what it is not, and this determination is presented as not being subject to challenge but rather constructed as being the objective truth (1975 and [1963]1994). Because patients’ subjective experiences are organized out of the diagnosis and treatment system, the power to diagnose and treat is embedded in the clinic and the laboratory, bestowed upon the professional, and formally described in the language of objectivity. Such a construction cultivates an environment in which the political and moral contexts of medical assessments are concealed, but nevertheless present, and hidden through the language of science. Foucault concludes that medicine’s practice of examining the body for pathological signs without any validation of symptoms has resulted in a construction of illness in which problems are seen as real only if their pathology or sign is empirically established by external experts using shared techniques ([1963] 1994). The subjugation of the individual experiencing the illness as a mere witness, invariably delegitimizes their experience, but even more importantly, it acts to malign and indict the individual. In this arrangement, argues Foucault, resides the ultimate realization of a science that is based upon the empirical objectification of what is projected as the truth ([1963] 1994). That is, biomedicine is realized as a science that disowns the very subject it is charged with healing.

_Delegitimation of Unexplained and Contested Illnesses_
From Foucault’s purview as a critical analyst of this biomedical paradigm, if there is no observable sign on the body, the only person who can verify that the pain exists is the patient. This condition represents a biomedical conundrum – that of the presence of a symptom without the legitimation of a sign. Given the elevated status of the sign over the symptom, the patient necessarily becomes problematic. The presentation of symptoms without empirical and presumably objective signs of pathology invariably compels the increasingly subjective framing of a symptom or symptoms. As Zola’s 1966 study, “Culture and Symptoms – An Analysis of Patients’ Presenting Complaints” concludes, the culture of any given population provides a deterministic framing of symptoms. Zola cites the example of non-literate societies that define hallucinations as being ‘normal’ and unproblematic; conversely, in a culture such as the United States, which values self-control, such an occurrence is cause for grave concern. This contrast in the definitions of hallucinations by different cultures demonstrates the mutability and inherent bias of such framing. For similar conditions characterized by the presence of symptoms and the concurrent absence of a sign, the particular framing of its symptoms becomes responsible for the subsequent legitimation or delegitimation of the presumed illness and the person experiencing the illness. The absence of a physically observable sign often results in the clinician’s subjective framing of the symptom, such that symptoms are attributed to personality characteristics, mental illness, malingering, or other morally charged assessments (Zola 1966).

Other writers have examined the ways in which unexplained illnesses are delegitimated by examining the diagnosis and treatment of specific illnesses. Norma C. Ware, for example, argues that the biomedical paradigm is responsible for the delegitimation of contested illnesses such as Chronic Fatigue Syndrome (CFS) (1992). As described earlier, contested illnesses are often devoid of any pathological or observable signs and are classified by many in the
biomedical community of clinicians and physicians as “psychogenic and therefore imaginary” (Ware 1992:356). This absolute negation of a category of illnesses characterized by a significant amount of suffering for the affected patient has prompted patient groups, advocates, and some biomedical representatives to contest this classification. As argued by Ware, such an evaluation is a “direct reflection of scientific materialism, which accords primacy to substance, equates the real with the physically observable, and discounts or bypasses altogether the subjective experience of the patient” (Ware 1992:356).

Applied to this paradigm of scientific materialism is the macrosociological construct of biopower. The concept of biopower, developed by Foucault, is that of the “medical bipolarity of the normal and the pathological” ([1963]1994:35). The very essence of such bipolarity is that that which is normal is necessarily antithetical to that which is pathological and vice versa. Foucault argues that this bipolarity is the means by which the state controls the behavior of its public – by institutionalizing normality and by defining anything that deviates from that normality as pathological ([1963] 1994). Accordingly, Ware argues that the delegitimation of biologically unexplained illnesses will continue as long as biomedicine “remains politically entrenched and consistent with core values and concepts in Western cultural tradition” (1992:356). Thus, Ware’s assessment of biomedicine questions the presumed validity of its “clinically” informed judgments of that which is normal and that which is pathological.

Invalidating the Subjective Experience of Pain and Illness

This materialist bias of biomedicine is revealed further in a study by Gillian Bendelow concerning the methods by which pain is diagnosed (1992). Bendelow concludes that “medicine tends to define emotional expression in experiences of pain as socially undesirable” and further, that “this moral evaluation may be gendered” (1992:212). To draw this conclusion, Bendelow
collected respondents’ reactions to several pieces of art depicting people in various states of pain and/or expressing various emotions. These reactions were subsequently analyzed to determine patterns and themes of the various reactions expressed by the respondents. This technique allowed Bendelow to “measure” a subjective phenomenon. As such, her analysis reveals that respondents attributed less validity to those images that displayed females in pain or distress and, correspondingly, more validity and empathy for those images of males in similar states. Additionally, these respondents were less likely to identify the qualities displayed as pain if no physical cause for the pain, such as a bandaged arm for example, was evident. This reaction was expressed by both males and females, but was especially characteristic of the male respondents. Bendelow’s findings add a layer of specificity to Foucault’s conclusions regarding the inherent delegitimation of subjective experiences of pain, such that the evaluation of females’ distress or experiences of pain is less valid than males’ expressions and experiences of pain. They also demonstrate that men are more likely than women to discount subjective experiences of pain as legitimate evidence of illness. Furthermore, the denial of the presence of pain in the absence of a physical sign is representative of Foucault’s sign-over-symptom discourse.

Bendelow’s research subsequently applies these evaluations, which represent the reactions of a relatively heterogeneous selection of the general population in London, to the field of biomedicine and its reductionist framework (1992). Her findings demonstrate that the emotional expressions associated with pain are devalued by everyday people, and provide a basis for my hypothesis that researchers may also take more seriously pain with a specific and clinically identifiable physical cause. In other words, the subjective experience of pain evokes a binary judgment: it is discounted as having any relevance to the experience of pain, and
concurrently, certain types of subjectivity associated with pain inherently invalidate the reality of that pain.

It is the distinctively moral essence of these judgments concerning the subjective experience of pain that demonstrates the intrinsic bias of biomedical claims. As such, Bendelow poignantly describes these reactions to emotional expression in experiences of pain as a “moral evaluation,” such that any condition for which there is no empirically-validated cause, no physical or objectively-defined medical explanation, is implicitly maligned as being somehow immoral, deviant, symptomatic of mental instability, or simply nonexistent and the product of exaggeration or over dramatization (1992). This moral evaluation of emotional expression in association with illness subsequently invalidates the illness and, as such, the sufferer, who in this case is more likely to be female. But because pain is ultimately subjective in the sense that only the person experiencing the pain has a genuine knowledge of that pain, it is even more susceptible to this judgment. In fact, it is this subjectivity that has generated the attempts by biomedical experts to attain an “objective,” positivist measurement of pain to subsequently legitimate the existence of pain. The totality of these reactions and concomitant moral evaluations as described by Bendelow is a particularly compelling representation of contemporary medical framings of illness (1992).

This reaction to and evaluation of the subjective experience of pain is essential to understanding Zola and other social scientists’ ideas about the social construction of pain and illness. Zola posits that the prevalence of certain diseases in populations is not necessarily determined by etiological incidence, but rather by what the patient selectively presents to the doctor (1966). It is important to note that Zola’s position was informed by the data available at the time, circa 1966; there is now considerable data collection occurring at the population level
that offers a more accurate assessment of disease prevalence independent of contact with the medical system. Nevertheless, Zola’s core assertion is that it is not the variability of disease that is the independent variable but rather the variability of the physician’s, patient’s, or culture’s “reaction” to said disease that often determines when the patient will pursue medical care. This is not to imply that pain and illness are merely the product of labeling and defining, but rather that its analysis and evaluation by biomedicine is part of a social process. The biomedical paradigm that upholds the ideal that empirically-based truth is attainable is also informed by and constructed via a social process that is inherently sensitive to the cultural influence constituted by moral judgments. In fact, it is one of the principal objectives of the present study to demonstrate that this contemporary model of biomedicine is primarily responsible for a framing that disregards illnesses of contention.

Joseph Dumit’s 2006 study “Illnesses You Have to Fight to Get: Facts as Forces in Uncertain, Emergent Illnesses,” manifests this social process of construction by examining the ways in which patients, doctors, and institutions use facts in order to make a judgment of illness. Relying on fieldwork, newsgroup postings, and published discussions among the sufferers of “emerging uncertain illnesses,” such as Multiple Chemical Sensitivity (MCS) and CFS (2006:577), his analysis reveals the experiences of patients as they try to “prove” the existence of their illnesses to physicians, insurance companies, the government, and even to their families and friends. It is the very uncertainty shrouding these illnesses that determines how the facts are deployed to legitimate the experience of the patient (Dumit 2006).

Dumit highlights the particularly problematic experience of obtaining a diagnosis for one’s condition (2006). A diagnosis, simple though it may seem, constitutes not only the legitimation of one’s illness, but also the validation of one’s sanity and honor – evidence that the
patient is not psychologically unstable and is not “faking” it. A diagnosis, in the Foucaultian sense that Dumit uses it, is an empirically-based and objectively defined classification of illness, a classification for which insurance companies and government programs assign a code that they are then obligated to compensate. As deftly presented by Dumit, “one must have laboratory signs in order to be suffering; one must suffer in code in order to be suffering in fact, or one does not suffer at all” (2006:580). Dumit’s analysis of the significance of the diagnosis is consistent with Foucault’s distinction between signs and symptoms. That is, institutional codes serve as the label for a specific diagnosis, which itself is the biomedical classification of the corporeal sign, the physiological confirmation that the symptoms experienced by the patient are real, i.e., valid, and thus valued by the institutions of biomedicine (Dumit 2006).

Dumit argues that this struggle to achieve a diagnosis reflects the limited amount, extent, and quality of scientific research into such contested illnesses (2006). “The fights over definitions, diagnosis, response, and prevention,” he argues, “depend disproportionately on this small amount of research, much of it underfunded” (2006:578). Given the “sign determinism” and the dominant scientific discourse about how to know when an illness is “real,” it is certainly surprising that the research into the pathology of these diseases is so limited. That is, the experiences of patients and the views expressed by biomedical experts attest to such a resolute denial of the legitimacy of contested illnesses that one would expect to find an overwhelming amount of scientific research supporting this delegitimation. This observation underscores the paradoxical and implicitly biased nature of the biomedical paradigm in the following manner: the biomedical community of clinicians, physicians, and researchers summarily dismisses a category of illnesses due to its enigmatic, complex, and ambiguous nature; at the same time, these researchers and clinicians are hesitant to conduct research on conditions that represent such
a challenge to their reductionist, objective, and positivist paradigm. In this sense, such illnesses are deemed not worthy of study. This observation compelled me to investigate the possible dynamics involved with this contentious framework of illness. Thus I turn next to one such social science account of the biomedical construction of a type of contested illness – that of chronic pain.

The Case of Chronic Pain

The case of chronic pain is particularly valuable for advancing our knowledge of how the normal and the abnormal is defined by biomedical science. Pain, in and of itself, is not considered an illness or condition; rather, it is merely a symptom for what is presumed to be a physiological pathology. Therefore, pain itself is not granted biomedical significance except in terms of its manifestation of pathology. It is when pain becomes chronic that it crosses the line from being a symptom to itself becoming a condition, but it does not become so without resistance from the biomedical community. Because acute pain is defined as a normal response by the body to an injury, pain that persists is necessarily defined as abnormal. Examining the basis for these characterizations of normality reveals much about the importance of signs as opposed to symptoms and the delegitimation of symptoms without signs.

One study that illuminates this process is a 1997 study conducted by Eccleston et al., which provides a more multidimensional portrayal of the ways in which the uncertain illness of chronic pain is defined and understood by different agents. Applying the paradigm of social construction, they sought to determine how chronic pain is negotiated by pain patients, pain professionals, scientists, and alternative practitioners. Eccleston et al. (1997) cite Foucault’s argument that medicine elevated the pathological signs of illness or injury over the symptomatic experience of the patient. This elevation of pathology reflects biomedicine’s hierarchical
valuation of a pure, objective, and empirical truth and the subsequent devaluation of the innately subjective experience of the patient. Significantly, they move beyond the pain experience of the patient, which is nevertheless instrumental, to also capture the clinician’s perspective on this condition.

Eccleston et al. found that professionals’ accounts are characterized by a resistance to the threat posed by the “undiagnosable,” a phenomenon that threatens the very foundation of Western medicine (1997). To effectively resist this threat, practitioners and physicians work to shift their responsibility to the representative of subjectivity, the patient (Eccleston et al.). They accomplish this shift by invoking psychological etiology, overdramatization, malingering, and other such personality-driven evaluations. Eccleston et al. argue that such an action is a typical response of “orthodox knowledge” to a threat or challenge to its legitimacy (1997:707). The extent to which this response is indeed typical of medical professionals in turn reflects the extent to which such evaluations are accepted as legitimate. The claim that these indictments by these professionals are provoked by a rather innate response to “danger,” is particularly intriguing and disturbing given their considerable acceptance by the medical profession as objective diagnoses.

Even more intriguing in Eccleston et al.’s study is the account provided by scientists: their explanation for chronic pain predominantly relies on a physical origin, and they reject any identified causes that are “unscientific” or that are not supported by any physical or empirical evidence (1997). Included in the realm of unscientific causes are those characterized as having a psychogenic origin. In contrast with physicians, these scientists agree with the statement, “there is always a physical cause of pain even if doctors cannot diagnose it” (Eccleston et al. 1997: 705). In this account, then, science is constructed as the “arbiter of worthiness and truth” (Eccleston et al. 1997:707). Underlying the authors’ analysis is the theory that power plays a
role in the construction of the identity of the chronic pain sufferer. For example, they write that “to be in chronic pain is to enter into a relationship with powerful others where one is automatically positioned as dependent, as less morally visible or responsible, and as a subject within discourses of blame” (Eccleston et al. 1997:706). This subordinate position occurs in relation to both the doctor and the scientist as the patient and her pain are subjected to moral evaluations by authority figures faithfully entrusted with protecting her health and well-being. It is within the context of this disturbing configuration that the authorities of biomedicine exercise their power to in turn refute the validity of not only the pain, but also the sufferer.

It is this configuration of scientific authority as the definitive judge of worthiness that frames this study. In my analysis of the data and subsequent discussion of the findings, I argue that the relationship between the chronic pain patient and the physician is an archetype of the relationship between biomedicine, positioned as the powerful arbiter of what is falsely presented as “truth,” and the subordinate group of patients who become the objects of biomedicine’s delegitimation. They are objects in the sense that biomedicine ultimately acts to objectify the bodies of its patients, to peel off any layers of subjectivity, of human suffering that may somehow cloud the reading of the pure, sterile, and omniscient medical instruments that “verify” pain. The utilization of such instruments in the form of mechanical devices and technologies has become ever more fundamental to the modern biomedical model of diagnosis. These instruments function to further distance the social dimensions and contexts from the experience of pain, instead isolating the study of pain to the lab, and further distancing the patient himself from its diagnosis. The outcome of this arrangement is yet another reification of the power relations that effectively dismiss and further delegitimate those illnesses that do not yield to such measurement.
Pain as a Medical Category of Illness

The positivist framing of illness by biomedicine is a dimension of this paradigm that isolates pain as an uncertain and ambiguous medical category, a category that blurs the boundaries between signs and symptoms, objective and subjective, and defies that which is knowable and measurable. As noted in the introduction, pain is defined as the body’s response to actual or potential tissue damage (IASP 2007). Identified as a symptom, it acts to communicate the presence of illness, damage, or injury to the individual in whose body the illness or damage is located. Therefore, the intrinsic value of pain is as an indicator of a physiological sign of pathology. Pain itself cannot be physically observed (other than physical expressions of pain) or experienced by anyone other than the person who is experiencing it. Because pain is perhaps one of the most subjective, if not traumatic experiences encountered by those whose task it is to stop and prevent it, it represents one of the most confounding, challenging, and contentious dimensions of a medical condition. Thus, constructed as an indicator or symptom of a previously undetected physiological condition, the subsequent detection of that condition would be the expected, logical conclusion regarding the presence of pain. As such, those situations in which the clinician or doctor fails to objectively verify the physiological basis or cause for that pain represent an anomaly that threatens the positivist model of biomedicine. That is, if no cause is identified, pain necessarily becomes problematic; for if pain’s only purpose is to signify the presence of a pathology, the absence of such a pathology defies logic.

Even more problematic is the experience of chronic pain. According to the literature of the biomedical sciences, the biomedical community has defined pain as chronic if it persists longer than three months. Although clinicians and doctors acknowledge that this timeframe has
been rather arbitrarily determined, it nevertheless functions as the standard. Accordingly pain is considered to be “normal” if it has been present for less than three months. Chronic pain is considered to be abnormal and potentially indicative of some type of defective physiological condition, or more likely as symptomatic of mental illness, malingering, or overdramatization. In this sense then, chronic pain crosses the boundary from being a symptom to that of being a medical condition itself. Its categorization as a contested illness exemplifies its framing as a condition rather than just a symptom. The chronicity of pain becomes even more problematic when the cause of that pain, i.e., the pathology for which the symptom of pain is presumed to exist, is unknown or cannot be explained. The simultaneity of pain that is chronic and pain that is unexplained constitutes a double-bind for biomedical approaches to illness – both characteristics threaten the logical, positivist construction of pain. If the source of the pain is undetermined, this makes the persistence of that pain that much more enigmatic and therefore challenging to standard constructions of pain.

Subjectivity as a defining characteristic. The study of pain, then, is infused with a particularly compelling need to objectify the experience of pain in order to validate that pain. The modern biomedical paradigm dictates that a subjective experience is only real or legitimate if it can be observed and measured (Foucault [1963] 1994). In this positivist perspective, subjectivity is necessarily suspect or otherwise framed as irrelevant. It is not enough to simply claim that one is in pain; the existence of pain must somehow be validated by the clinician, researcher, or doctor. The inherent subjectivity of pain is itself deserving of further attention here. In addition to the actual sensation of pain, it can also cause fatigue, weakness, nausea, depression, and anxiety, to name just a few of its effects. Furthermore, the social dimensions of pain are significant as well in terms of the context in which pain occurs or is exacerbated. The
multidimensional, subjective experience of pain constitutes an overwhelming experience that, left untreated, can wreak havoc on the sufferer’s ability to simply function and lead a healthy, productive, and satisfying life.

*Scientific Publication as Official Symbol of Scientific Authority*

    Scientific authority is manifested in written and verbal claims, visual images, speakers, rules, and material items. It is itself the product of a social universe that is bounded by the “distribution of power…its struggles and strategies, interests and profits” (Bourdieu 1975:19). The written claims of science as presented in the publication of scientific research represent a distribution of power in the sense that it is the product of a culturally-laden exercise in the political landscape of funding, grants, competition with peers, reputation, and the highly influential brokers of financial resources. Given the high stakes of such a landscape, as Bourdieu argues, the official symbol of scientific authority, the publication of research, is necessarily infused with and informed by the political struggles of biopower (1975).

    As Bourdieu (1975) and Latour and Woolgar ([1979]1986), among others, have noted, what gets studied is shaped by distributions of funding, the extent to which problems and their solutions are profitable, and as Thomas Kuhn (1962) pointed out, the extent to which the problems are indeed solvable. As illustrated by this characterization of scientific authority, it has been suggested that the deterministic distribution of power in the political landscape of science may be responsible for the subsequent biomedical construction of chronic pain. Empirically speaking, chronic pain is considered problematic given its ambiguous and enigmatic nature and etiology. The inherent difficulty of objectifying, measuring, and physically observing pain itself renders it as suspect by some in the biomedical sciences. Even more significant, however, is the contention over the appropriateness of pain as an illness category.
The Present Study

As the above discussion has demonstrated, numerous sociological studies have examined the social construction of pain from the perspective of the patient, while others have examined it at the micro level of the individual physician, alternative provider, or scientist. There have been no studies, however, that have examined the biomedical framework as it is represented in the scientific publication of biomedical research. As noted earlier, scientific publications serve as the foundation of this construction in the sense that the publication of research is considered the ultimate validation of that research and its findings. Furthermore, it is from these publications that the practice of medicine derives its instructions for how to practice.

With this study, I ultimately seek to improve our understanding of the ways in which biomedicine delegitimizes illnesses that it cannot empirically comprehend. As argued by Eccleston et al., the inability to identify the source of pain, that is, the “sign,” challenges the very foundations of Western medicine as being “scientific, powerful, technical, and efficient” (1997:706). Indeed, it is this phenomenon that threatens the very foundation upon which biomedicine is constructed and as a result, the foundation, validation, and legitimation of biopower. Therefore, a critical analysis of the manifestation and symbol of that power, the scientific publication, is fundamental to understanding and ultimately deconstructing the biomedical delegitimation of chronic pain and, by default, the person who suffers from that pain.

Data Collection and Selection and Content Analysis

To determine how the condition of pain, and in particular, chronic pain is constructed within and by the field of biomedicine, I examined a collection of articles appearing in the peer-reviewed scientific publication, *Pain*. This journal, which first began publication in 1975, is the largest in the field in terms of the number of articles published each year and the first one
devoted exclusively to the study and treatment of pain. It also serves as the official publication of the International Association for the Study of Pain (IASP). Specifically, the journal “publishes reviews and original research papers on the nature, mechanisms, and treatment of pain” (2009). According to pain researchers with whom I consulted at the University of Cincinnati’s department of pediatrics and neurology, Pain is widely respected and considered to be one of the premiere sources of biomedical research concerning pain. Additionally, according to the ISI Web of Knowledge, the official source of journal impact factors, the 2008 impact factor for Pain is 6.03 (2009). Even more significant, however, is Pain’s ranking among other journals within its subject categories, which according to ISI are anesthesiology, clinical neurology, and the neurosciences. Pain is ranked 1st among 22 anesthesiology subject journals, 8th among 156 clinical neurology journals, and 21st among 219 neuroscience journals. For the purposes of this paper, I selected a total of 21 articles published between May 2008 and May 2009 using a random selection process in order to obtain a relatively representative, albeit small, sampling of the types of articles currently being published.

Prior to selecting this sampling method, I tried a number of different sampling methods to determine the most suitable one for this study. First I began a review of all of the articles appearing in all issues of the journal from 1999 through 2009. However, upon learning that this journal publishes approximately 20 research articles in each issue, with 21 issues published each year, I then attempted another method to reduce the total number of the sample. This method consisted of examining every 15th article beginning with the year 2004. From these two methods, I determined that the content and form of the articles did not vary significantly from 1999 to 2004. I also found that a random selection of articles was efficient in terms of providing a sampling of various types of articles being published. Finally, I selected the most recent 12
month period of time in order to provide the most current reading of research on the subject of pain. Of the approximately 420 articles published in this timeframe, I used a random sampling procedure to select 25 articles. Given that each article presented a wealth of relevant data, I concluded that I had fulfilled the scope and extent of my research objectives at 21 articles, the final number.

My analysis of the content sought to identify how pain is measured and defined in the context of a journal specifically devoted to the study of pain. In my initial analysis, I examined how the articles depicted the characteristics of severity, etiology, duration, response to treatment, type of pain, type of subjects, the demographic characteristics of the patient(s), if applicable, location on the body, methods of detection, and the observation of signs. This analysis soon indicated that certain of these variables were not necessarily of any great significance in terms of the specific goals of a majority of the studies. Therefore, I classified and arranged these characteristics into a set that more clearly elicited the attention of the various investigators. The subsequent themes as represented by these characteristics are as follows:

- Type of pain, including its location on the body
- The goal of the study (identifying the etiology of the pain or a potential treatment)
- The presumed or hypothesized etiology of the pain (physiological or psychological, or some combination thereof)
- The type of subjects participating in the study – healthy humans, humans with the condition of interest, or animals
- Duration of the condition – acute or chronic
- The overall goal of the study
- The method of measurement
The final and most significant theme identified in these articles is the observation of signs; in fact, this theme inherently served as a fundamental nexus for most of these studies.

I found two additional characteristics to be of relevance while in the process of examining these articles – the disciplines of the authors and the nations represented. Many of the articles represented a multidisciplinary authorship, often consisting of quite the amalgam of disciplines. For example, the authors of an article that examines individual differences in responses to heat and cold stimuli represent the following departments or institutes of public health and universities: mental health, anesthesiology, oral and maxillofacial surgery and neuroscience, psychology, and a department of genes and environment within a division of epidemiology (Nielsen et al., 2008). Because various scholastic disciplines approach subjects differently, knowledge of the disciplines in which these studies are grounded provided a framework for understanding their particular treatment of the research question and are noted accordingly. Also, given that *Pain* is a publication of an international society, I noted the nation(s) represented by the various authors to determine any distinct similarities or differences in the study of pain across regions of the world.

The variables of pain severity, response to treatment, and the demographic characteristics of the research subjects were captured in my data collection and examination, but they were only included in the subsequent analysis and comparison of data if they served as operational variables in the particular study under examination.

This identification of the significant characteristics that constitute the objectives, purpose, and overarching approach of each study was subsequently organized, compared, and analyzed to determine the presence of themes, patterns, and classifications associated with the examination and analysis of pain. This qualitative approach entailing the methodology of content and textual
analysis allowed me to specify the ways in which pain is simplified and objectified and how measurement shapes the reality of pain and suffering. Based on the themes and patterns identified, I constructed a matrix (Appendix A) that ultimately represents the biomedical model for determining the legitimacy or validity of the specific type of pain examined.

**FINDINGS: The Positivist Model of Validating the Existence of Pain - Objectify, Specify, Quantify, and the Identification of Visible Signs**

*Overview of Findings*

As anticipated, the most common principles guiding the articles appearing in *Pain* over the past year are that of objectivity, specificity in terms of investigating the sources and manifestations of pain, and the identification of observable and measurable signs. These principles are manifested in the selection of subjects, the methodological framework of the particular study, the tools used to measure pain, the type of pain studied, and the predominant etiological explanations for pain. These variables are graphically organized according to each of the 21 articles examined for this study in the Pain Themes & Patterns Matrix in Appendix A. (Appendix B contains an ordered list of the numbered articles appearing in the Matrix). The principles represented by these variables are reflective of biomedicine’s ultimate search for pathology (which refers to the physiological or functional manifestations of illness), a search that does not necessarily refer back to the symptoms of that pathology. One of the most striking features of the articles under study is that the majority of subjects tested consisted of healthy, pain-free humans or animals; a second striking finding is that in many of these studies, the type of pain being investigated is not as important as the measurement of the subject’s pain *threshold* in response to a stimuli intended to induce temporary, and hence, *acute* pain.
Although many of the articles identified an overarching interest in understanding the mechanisms involved in a particular pain condition as the primary reason for the study, most of the studies utilized experimental pain stimuli to induce pain in subjects to identify or confirm the specific physiological processes involved in the genesis, and the possible maintenance of various pain conditions. Here we see evidence of what Clarke et al. have called the “molecularization” of illness (2003). Several of the studies did not specify the type of pain being studied; rather, the researchers specified a particular physiological or pain mechanism with the intention of enhancing the understanding of pain states or sensations in general. This isolation of physiological mechanisms in the context of lab experiments evokes Foucault’s distinction between the body, the sign, and the person, who in this context is seemingly irrelevant. Additionally, confining the examination of the pain mechanism to the lab further distances the measurement of pain from its context of the sufferer’s experience.

Confounding the experimental pain framework of the research was the previously mentioned selection of healthy subjects upon which to test responses to pain stimuli. The use of healthy subjects in addition to experimental pain stimuli further isolates the study of pain to a set of “normal” circumstances that preclude any consideration of those conditions or characteristics that accompany the experience of a genuine pain condition. Of the 21 articles examined, 4 utilized rats or mice as test subjects and 7 tested only healthy human subjects. Of the remaining articles, 6 studies only examined humans with the pain condition of interest, while 3 examined both humans with the condition and healthy humans as control subjects. The remaining article consisted of a literature review of published research investigating physicians’ attitudes and beliefs concerning the very prevalent condition of low back pain.
The selection of healthy subjects for the testing of pain responses has had a long history in experimental research. These healthy subjects often serve as a “control” group to compare against “unhealthy” subjects or those subjects with the condition of interest. The selection of experimental pain stimuli in addition to healthy subjects (particularly in those experiments in which they served as the only group of subjects) is distinctly representative of the positivist, objective, and reductionist model of biomedicine. That is, healthy subjects are selected as representative of that which is considered “normal.” The subsequent application of research findings to better understand the mechanisms of pain in those people with a pain condition necessarily dismisses the potentially significant characteristics of the whole person or the context of the pain from which the “abnormal” person suffers. Similarly, the use of experimental pain stimuli disassociates any possible subjective or attendant characteristics of the type of pain that is presumably being simulated. It reduces the pain experience to a single, mechanical stimuli. This simulation of pain is conducted to, in turn, facilitate the objective measurement of the induced pain via an electromyograph, or EMG (an instrument that records the electrical activity of a muscle), a pain rating scale, or other type of instrument.

Two consistent themes among a majority of the articles were the objectives of identifying pain etiology and whether physiological or psychological factors were responsible for the pain. Eighteen of the 21 studies investigated pain and pain conditions with the intent of determining their possible etiology, while only 3 studies were solely interested in finding or testing a possible treatment of the condition. Four of the studies consisted of a combination of the two orientations. It should be noted that many of the researchers of the etiology-oriented studies aimed to uncover possible sources of pain with the eventual goal of finding corresponding treatments. In terms of the specific type of etiology that characterized these studies,
physiological explanations dominated their investigations, while psychological explanations represented a smaller proportion of the investigations, and a combination of both types characterized just a few of the studies. There was no discernible pattern between this characteristic of etiology and any of the other variables of note.

*How to Measure Pain and Suffering: Scales, Thresholds, and Instruments*

The most prevalent methods used to study pain in these studies were pain measurement *scales*, measurement of pain *thresholds*, and various *mechanical instruments*. The standard pain scales used in these studies are the 11-point numeric pain rating scale, in which 0 represents no pain and 10 represents the worst pain one could imagine, and the visual analogue scale or VAS (see Appendix C for both scales). Both of these scales require subjects to quantify their experience of pain by assigning a number to indicate the severity of the pain (in the case of the numeric scale) or a position representing the level of pain on the VAS, which is then correlated to a numeric pain rating by the clinician. These scales also presume a fixed and stable distance between one “level” of pain and another. The articles consistently suggested that higher “levels” of pain were more important to understand. Another frequently used method consisted of various mechanical instruments to measure physiological, molecular, and biochemical pathways of pain to detect pain severity and specific physiological mechanisms or signs. The final characteristic that dominated most of the studies was a focus on pain occurring in a very specific location on the body. This focus demonstrates the tendency of biomedicine to consider and examine that which is specific and local. It therefore exemplifies a reductionist view of health and illness. Of the three major findings, it is undoubtedly the identification of physiological signs associated with pain that first and foremost legitimates the symptom of pain.
Measuring Pain and Suffering: How researchers simulate pain to investigate pain mechanisms, utilize mechanical instruments to assess those mechanisms, and employ animals as substitutes for human subjects

Measuring the existence of pain via experimental pain stimuli. Fifteen of the 21 studies employed experimental pain stimuli to either advance the understanding of specific pain mechanisms that are hypothesized to account for certain types of pain or to determine which physiological mechanism may be responsible for various pain states. Measurements of pain in these experiments included a reliance on pain thresholds; these thresholds were identified during the pain simulation process as subjects were instructed to notify the clinician at the first sign of pain. The type of stimuli used to induce pain varied among the studies. The following descriptions provide a sampling of the types of stimuli used: the application of thermodes delivering heat stimuli to the volar surface of the forearm and submerging the subjects arm and hand into cold water to measure pain intensity and discomfort via the VAS (Nielsen et al. 2008); “transcutaneous electrical stimulation at high current densities” and pinprick, otherwise known as mechanical, stimuli (Filitz et al. 2008:262); an “impact-stimulating device” applied to the left index finger (Hermann et al. 2008:399); drug-induced neuropathy in rats and mice (Steenwinckel et al. 2008); and “a pressure algometer” to test “sensitivity to deep stimuli applied to the lateral side of a painful temporomandibular joint” (Ayesh, Jensen, and Svensson 2008:287).

Although almost all of the studies using healthy humans or animals employed such stimuli to simulate pain, it is particularly revealing that research investigating specific pain conditions by selecting individuals with the conditions to participate in them were predominantly characterized by the testing of experimental pain stimuli on those subjects. Additionally, even in those studies using animals as subjects, a chronic pain condition, neuropathic pain or
hyperalgesia, was surgically or chemically induced to in turn investigate physiological mechanisms associated with that condition. In all of these studies of animals and humans with the condition of interest, it is apparent that the researchers are attempting to account for chronic pain by determining if, on a cellular, molecular, or biochemical level, sensitization to pain has been altered by injury and/or acute pain (Steenwinckel et al. 2008; Hermann et al. 2008; Martucci et al. 2008; Schwartz et al. 2008; Namer et al. 2008; and Schweinhardt et al. 2008). Thus, the use of experimental pain stimuli is targeted to identifying a very specific, local, and apparently isolated mechanism. The considerable emphasis placed on understanding the mechanisms of pain is evident in the researchers’ attempts to simulate conditions of pain in a sterile, vacuous, and otherwise unmitigated environment. The extent to which this environment is achieved ensures the clarity and purity of the researchers’ examination and subsequent assessment of the particular mechanism. The priority placed on this environment thus supersedes the context of any particular pain condition, which effectively negates the experience of that pain.

Hermann et al.’s study of children with chronic abdominal pain is especially instructive for demonstrating how mechanisms of pain take center stage. This study evokes a “psychobiological model of chronic pain” in which “enhanced attention to pain” serves as a core mechanism in the potential development of chronic pain (Hermann et al. 2008:398). This model theorizes that if the presence of pain is “perceived as threatening,” a hypervigilance in terms of closely monitoring one’s body is likely to occur (2008:398). The investigators proceed to conduct an experimental pain simulation with the children as subjects to determine potential alterations of certain brain processing mechanisms in response to the simulation of pain. Specifically, they employ such instruments as an electroencephalogram (EEG), a neuroimaging
device, and the VAS to determine if non-painful and painful mechanical stimuli administered to the left index finger of the child is associated with altered mechanisms. The focus of the study is not necessarily the initial etiology of the abdominal pain. And although the subjective experience of pain is mentioned as being important to understanding the possible development of chronicity, this subjectivity is reduced to a specific set of brain processing mechanisms: “One of the hallmarks of the early frontocentral P3a component elicited by salient stimuli outside the focus of attention is that it habituates rather rapidly [23]. This habituation involves activity of the prefrontal cortex and especially the dorsolateral prefrontal cortex [54,55] which presumably exerts active control on pain perception [60,62]” (Hermann et al. 2008:403). Applying this claim to their set of findings, Hermann et al. conclude that the attentional bias of their subjects with chronic abdominal pain “may reflect a deficit in keeping pain out of the mind and, possibly, difficulties in sufficient activation of pain-inhibitory processes” (2008:403-404). As this conclusion indicates, specific brain processing mechanisms are cited as being responsible for the perpetuation of the children’s pain.

Hermann et al.’s study (2008) is also significant in terms of its strategy of studying acute pain mechanisms to advance the scientific understanding of chronic pain. This strategy is not unique and in fact is employed in most of the articles examined here that address various chronic pain conditions. In contrast to the observation that chronic pain is underrepresented in biomedical research, it is particularly notable that 14 of the articles examined here did address chronic pain in some respect. Nevertheless, this finding is partially offset by the fact that of these 14 articles, 9 use experimental pain stimuli to evoke pain, subsequently measuring the pain response and applying that measurement to better understand pain mechanisms. As this pattern indicates, acute pain models are serving to uncover the dynamics of chronic pain. Thus, this
represents another common pattern in these studies related to the reductionist tendency to apply mechanical, specific, and objective testing techniques to advance our understanding of the complex, multidimensional, and irreducible condition of chronic pain.

Of those studies in which healthy humans were tested with experimental pain stimuli, pain was measured similarly to those studies of subjects with a pain condition. In addition to the VAS, the 11-point pain scale, and pain thresholds, studies of healthy humans utilized EMGs and functional magnetic resonance imaging or fMRIs (Falla, Arendt-Nielsen, and Farina 2008). The study that employed fMRIs is particularly notable in the specificity of its application. This 2008 German study by Iannilli et al. investigated the etiology of trigeminal (facial) pain by applying electrical, mechanical, and chemical stimuli to facial areas. The authors used fMRIs to measure the brain activity of the 18 healthy subjects during the experimental phase. They then analyzed the images to determine whether these different types of stimuli produced different patterns of brain activation. Following the sessions, the subjects were asked to rate the stimuli in terms of its degree of pleasantness or unpleasantness and the extent of intensity perceived from the stimuli. Their analyses of the data revealed the complexity of brain activity in response to various stimuli but also revealed the existence of several activation patterns involved in the sensation of pain (Iannilli et al. 2008). Iannilli et al.’s measurement of the degree of pleasantness or unpleasantness experienced during the experimental phase reflects an attempt to capture more than simply the pain level and to investigate a more complete sensory system response. Consistent with the other findings of the present study, however, even this measurement yields a quantitative assessment of such a sensation.

Another study that tested experimental pain stimuli on healthy humans sought to determine the existence of and the extent to which individual differences in pain sensitivity are
predicted by genetic and environmental factors. Significantly, this is one of few studies in the literature that questions the tacit use of pain rating scales as accurate comparisons of responses to pain between individuals. Citing the finding that genetic factors accounted for 60 percent of the variation in the cold pain index and 26 percent of the variation in the heat pain index, thereby indicating that “genetic influence is largely modality specific,” the authors argue against the “indiscriminate aggregation of pain measures” (Nielsen et al. 2008:26). Although the authors cite this finding to demonstrate that individual differences in pain ratings may be genetically mediated, it is interesting that they then proceed to apply their findings to “validate” the presumed subjectivity of pain rating scales. Nielsen et al. indicate that the validity of VAS ratings has been contested for comparisons between subjects; it is claimed that the previous pain experiences of the subjects may influence their pain ratings. However, because they estimate that only 5 percent of the variance in the Cold Pain Index and 8 percent of variance in the Heat Pain Index is “attributable to unique environmental factors that affect both phenotypes…scaling differences represent a minor source of error” (2008:27). Therefore, they conclude that any “individual differences in VAS ratings of pain evoked by the same intensity of stimulation” primarily “reflect actual differences in experienced pain intensity…In the absence of clear evidence to the contrary, dismissal of pain ratings due to their subjective nature is unwarranted” (p. 27, my italics).

Although this statement ostensibly appears to support such “subjective” pain ratings, the argument that precedes it indicates instead that subjective states such as “previous pain experiences” are not considered to be valid sources of individual differences; rather they must be demonstrated to have no or minimal effect on the pain ratings. Thus, the negation of pain ratings due to their subjectivity is not justified because they do not meet that definition. If they did meet
the definition of subjectivity, as this line of thought indicates, these pain rating scales must then be dismissed. As my earlier examination of the extant literature on this subject revealed, the work of several sociologists has demonstrated that the subjectivity of pain is dismissed as either irrelevant in terms of the physiological sign or as intrinsically problematic in its potential to skew positivist and reductionist measurements of pain. Thus, Nielsen et al. indicate that the subjectivity of pain is inherently suspect by virtue of its presumed detachment from pathological signs (2008).

Those studies that used animal subjects to test the effects of experimental pain stimuli were consistent in their selection of measures to investigate pain responses. The primary means of measuring the mice and rats’ pain response consisted of the assessment of behavioral responses, such as the withdrawal of a paw from the site of a painful stimulus. All four of the experiments with rats or mice used this method of pain assessment, and two of the studies used additional methods, such as cellular level testing of the animal’s tissue and biochemical evaluation of spinal and other nerve tissues. For the purposes of this paper, it is particularly significant that one of these four studies, described next, not only assessed behavioral responses more extensively than the other three animal studies, but also more extensively than many of the studies of human subjects.

In their 2008 study, Hummel, Lu, Cummons, and Whiteside, all scientists with Neuroscience Discovery Research of Wyeth Research in the United States, state their research goal as that of investigating the mechanisms involved in the affective states of pain, with the intention of developing a better understanding of potential pharmacological pathways as well as a more informed awareness of the subjective impact of pain on the overall quality of life. Given the incorporeal dimensions of this goal, it was certainly unexpected to learn that their test
subjects were not humans, but rats. Emphasizing that they employed “pain models that are predictive of the human condition,” Hummel et al. specifically rely on an animal paradigm that only they themselves have “validated,” which incorporates both “sensory and motivational-affective aspects of pain” (2008, p. 443 and p. 437). As this statement suggests and as the following description demonstrates, it is apparent that Hummel et al.’s conceptualization of the human condition, as manifested in this model, is very limited and standardized.

This animal paradigm begins with an assessment of the affective components of pain, wherein Hummel et al. perform spinal nerve ligations on a group of rats (2008). Following the measurement of pain thresholds via paw withdrawal responses, the investigators applied a “modified conditioned place aversion (CPA) paradigm” in which rats’ interactions with novel objects and hind paw withdrawals during “painful conditioning sessions” were calculated in addition to the rats’ “conditioned place aversion to a pain-paired environment” (Hummel, et al. 2008:436). As their results indicate, the behavior of rats subjected to neuropathic or inflammatory injury demonstrates a significant conditioned place aversion to environments associated with pain. Another finding that is significant in terms of demonstrating the chronicity of such affective behavior resulted from the retesting of conditioned place aversion one month later with the same rats. The results indicated a maintenance of this aversion one month following the initial testing sessions (Hummel et al. 2008).

Hummel et al.’s study is particularly instructive for the purposes of this thesis in that it serves as an exemplar of the scientific paradox that often characterizes the study of chronic pain. The authors’ stated goals are exceptional in the sense that they not only acknowledge, but also emphasize the significance of chronic pain on affective, psychological states, as well as its role in limiting daily activities and one’s “overall quality of life” – in essence the subjective
experience of pain (2008:436). They indicate that although the physiological mechanisms responsible for the physical sensation of pain are well-defined, similar mechanisms responsible for the development of “negative affective states are less clear” (p. 436). They proceed to explain their methodologies for assessing affective states of pain using behavioral tests on rats. Using rats as test subjects of course restricts the means of measurement to that of behavioral responses. In spite of this limitation, this particular model aspires to objectively measure what is ultimately a subjective state – and therein lies the paradox. Using captive laboratory animals to assess the “motivational-affective” aspects of pain reflects a theoretical paradigm that presupposes that objective measurement is the only valid measurement, that laboratory experiments are valid measures of the experiences of non-laboratory induced pain, and that animals are good substitutes for humans.

Identification of the sign to determine or understand the mechanisms of pain. In addition to the use of instruments to verify the existence and characteristics of pain, the other significant item measured in the current studies was specific to and representative of the physiological limitations of the type of pain being examined, and as such, the physiological signs associated with that pain. In other words, researchers were predominantly interested in identifying the pathologies or signs associated with pain to in turn examine and further understand the physiological mechanisms of pain. For example, Ayesh, Jensen, and Svensson’s study of temporomandibular joint syndrome, otherwise known as TMJ, assessed each subject’s ability to open his or her jaw prior to and following the injection of ketamine, a general anesthetic (2008). The subject’s response to this anesthetic would indicate whether TMJ is caused by those receptors (a “cell or group of nerve endings that respond to sensory stimuli”) that respond to this type of anesthetic (Dictionary.com: Stedman’s Medical Dictionary 2009). In another study
examining the mechanisms responsible for the development of hypersensitivity to cold and a pain condition known as allodynia (defined below), Namer et al. (2008) assessed the inflammatory responses of skin to the application of potentially pain-inducing compounds, cinnamaldehyde, and menthol, with Laser Doppler Imaging. This technique employs the “Doppler effect” via a laser to directly measure the microcirculatory flow of cutaneous tissue. Another device known as a thermotest, assessed both pain and thermal detection thresholds at the location of the application of these compounds. These tests were conducted with both healthy subjects and those with a condition known as “cold injury,” which is known to induce “hypersensitivity to cold and cold allodynia” (Namer et al. 2008:63).

Other studies also measured certain physiological characteristics applicable to the general experience of pain, including the previously mentioned Hermann et al.’s 2008 study of children with chronic abdominal pain and Schweinhardt et al.’s study of women with chronic vulvar pain (2008). Specifically, Hermann et al.’s study concerning children’s pain employed an EEG to assess the extent of electrical activity on the brain. The EEG recordings allowed the investigators to determine the impact of painful stimuli in terms of brain activity levels and to, in turn, examine its relationship to the children’s rating of pain via the VAS. In their study of women with vulvar pain, Schweinhardt et al. conducted fMRIs, which specifically measures metabolic changes that occur in active parts of the brain, to capture the brain images of both healthy subjects and those with the condition. They subsequently applied voxel-based morphometry (VBM), a neuroimaging analysis technique, to classify the brain tissue into “gray matter, white matter, CSF [cerebrospinal fluid], or background” (2008:413). Both of these studies employed mechanical instruments to measure distinctive and specific brain activity and tissue in order to, in turn, measure the impact of two very different types of pain. Hermann et
al.’s study further objectified the experience of pain by associating the children’s pain ratings with the extent of electrical activity on the brain, thereby making a connection from one quantitative assessment to another.

Measuring atypical pain responses as signals of pathology. Three distinctive types of pain response were measured in four of the studies using human subjects in addition to two studies testing the pain responses of mice. The first four studies examine subjects with, respectively, TMJ, chronic neuropathy, the aforementioned cold injury, and one that examines pain mechanisms in general using experimental pain stimuli (Ayesh et al. 2008; Attal et al. 2008; Namer et al. 2008; and DeCol and Maihöfner 2008). The types of pain responses under study in these articles are allodynia, hyperalgesia, and hypoesthesia. Allodynia refers to the sensation of pain resulting from a “painless” stimulus to the skin. Hyperalgesia is defined as increased sensitivity to pain and hypoesthesia as “an abnormally weak sense of pain, heat, cold, or touch” (Random House Dictionary 2009). Ayesh et al.’s study of TMJ assessed subjects’ sensitivity to tactile and pin-prick stimuli at 11 sites around the affected joint. Additionally, they measured the “presence or absence of allodynia or hypoesthesia to a light mechanical brush of the skin above” the joint (p. 287). This sampling of articles that attempt to measure and objectify a type of pain response that is inconsistent with our understanding of a “normal” response is particularly emblematic of the barriers confronted by pain researchers. That is, how does one accurately measure a condition in which the subject’s sense of pain is weak? Nevertheless, it is this very problematic nature and complexity of such a condition that increases our knowledge of the social construction of pain.

Attal et al.’s study of neuropathic pain also determines the presence of allodynia and/or hyperalgesia in subjects with this type of pain (2008). This study serves as another example of
the scientific drive to objectify, specify, and systematize as a means by which to better understand a pain condition. The observation that the authors work out of the Center for the Evaluation and Treatment of Pain in Nice, France, offers a possible glimpse of the theoretical perspective of such pain centers. Attal et al.’s specific goal for this study is to determine if there are any direct relationships between the distinct etiologies or locations of neurological lesions and the “clinical expression” or symptoms of neuropathic pain. As further specified by the authors, they are attempting to determine if the symptoms “reflect the pathophysiological mechanisms” (p. 344). In classic Foucault fashion, Attal et al. are maximizing here the significance of the sign in relation to the symptoms presented. Essentially, their study is based on the tacit assumption that symptoms are mere hints of very specific and local physiological mechanisms. Thus, if the symptoms are not consistent with the physiological signs, it is the symptoms rather than the signs that incur skepticism. Although neuropathic pain has many causes, it is distinguished by the presence of a “relatively small number of core positive symptoms such as burning pain, electric shocks, dysesthesia (impairment of any of the senses, especially touch), allodynia, and negative signs, such as sensory deficits,” that differentiate it from other types of chronic pain (p. 343). To test for allodynia, the subject’s skin was stroked with a paintbrush three times; if it produced a “clear sensation of pain,” allodynia was considered to be present (p. 344). As this procedure indicates, the paintbrush is fundamental to obtaining a verifiable diagnosis of allodynia, and the subject herself is only necessary as a reporter, a witness to the experience of pain.

DeCol and Maihöfner’s 2008 study examines the role of the central and peripheral nervous systems in the development of hyperalgesia and hypoesthesia. To test their hypothesis, they use low- and high-frequency electrical stimulation to determine the mechanisms that
produce these pain-related symptoms. This article provides another example of a study in which no specific pain condition is specified, but rather a *pain mechanism* is the targeted subject. As such, healthy humans serve as the test subjects. DeCol and Maihofner represent, respectively, the Department of Neurology and the Department of Physiology and Experimental Pathophysiology, both at the University of Erlangen–Nuremberg in Germany. The purpose and nature of this study is very specific and mechanical, as are the methods used for implementing the pain model, representing a reliance on positivist standards of pain rather than subjective experience. I call attention to these characteristics not to emphasize their distinctiveness, but rather their virtually universal application to the study of pain.

Martucci et al.’s study (2008), consisting of animal subjects, is similar to Attal et al.’s study (2008) in that it concerns neuropathic pain. However, its explicit goal is not to investigate symptoms in relation to etiology, but rather to determine the effectiveness of an experimental treatment mechanism. Martucci et al. measured the paw withdrawal responses of mice to mechanical and thermal stimuli to in turn determine if a particular receptor antagonist, which in this case is a form of acid referred to as PPADS or pyridoxalphosphate-6-azophenyl-2’,4’-disulphonic acid, reduces the hyperalgesia and allodynia resulting from nerve injuries associated with neuropathic pain (2008). The results of this experiment indicated that this receptor antagonist “diminishes painful and inflammatory biochemical consequences” of nerve injury (Martucci et al. 2008:90). Although determining the etiology of this type of pain was not an explicit goal, the moderating effect of this antagonist on these pain-related behaviors was also significant in terms of its implications for the etiology of nerve pain in that it indicates that certain biochemical, molecular, and cellular-level processes may be distinctively altered by nerve injury (Martucci et al.).
The final study of this category is similar to DeCol and Maihöfner in its focus on more general mechanisms related to hyperalgesia and in the authors’ background in neuroscience. It is distinctive, however, in that it explores pain mechanisms specifically associated with the persistence of pain rather than acute pain. Schwartz, Lee, Chung, and Chung use mice to examine the mechanisms that may contribute to general neurological conditions and brain dysfunction (2008). Testing for pain responses related to hyperalgesia, the authors aim to differentiate between central and peripheral sensitization, which will aid in a better understanding of those mechanisms.

*Survey-Based Measurements of Pain: Quantification of the Subjective and Psychological*

Four pain assessment tools utilized in these studies offered an alternative type of assessment from the mechanical instruments and devices previously addressed. These tools are the McGill Pain Questionnaire (see Appendix D), the Neuropathic Pain Symptom Inventory (NPSI) (Appendix E), the Pain Catastrophizing Scale (PCS) (Appendix F), and the Medical Outcomes Study (Appendix G). All four of these survey tools initially appear to measure the experience of pain in a more multidimensional, subjective, and holistic manner. However, a closer examination reveals the quantitative nature of these surveys, an approach that subsequently objectifies the experience of pain by assigning numerical scores to various dimensions of pain.

The McGill Pain Questionnaire was designed to provide a quantitative, objective, and specific measurement of the subjective experience of pain. As this analysis of scientific research indicates, the measurement of pain, and in particular pain that is localized to a specific area of the body, serves as one of the methods by which pain is validated. Pain that is more *localized* and *specific* as opposed to more widespread throughout the body is considered to be more
credible evidence of the presence of pain. The McGill Pain Questionnaire is one important tool for evaluating local and specific pain; it was first developed by Ronald Melzack, an experimental psychologist, in 1975. As one of the more prevalent instruments used to measure pain, a review of this measurement instrument offers insight into the process by which the presence of pain is validated.

Melzack argued that pain does not consist solely of sensory dimensions that capture the intensity of pain, but it also consists of affective and evaluative dimensions of experience (1975). By affective, Melzack refers to the emotions and feelings that may accompany pain, such as tension and fear. By evaluative, he is referring to the “subjective overall intensity of the total pain experience” (Melzack 1975:278). Therefore, Melzack developed the questionnaire to contain words that evoked these various dimensions. At first glance, it would appear that contra Foucault, subjective experiences are a critical component of this tool’s method of measuring pain. As I will demonstrate, however, subjectivity is highly circumscribed and measured in a very narrow manner. This measurement makes it amenable to aggregation, such that it results in a greater distance between subjectivity and diagnosis, and forces subjects to simplify what might be quite complex and even contradictory experiences.

In administering the questionnaire, the respondents are instructed to select the one word from a list of several other words, categorized according to various dimensions of pain, that best describes their current pain. Each word in each category is assigned a number of points that corresponds with the level of pain that each word represents, with the higher numbers representing higher levels of pain. The ratings for each category are then added together to obtain a total score, the level of pain being experienced. The higher the pain score, the “greater the pain,” according to the questionnaire instructions.
The rating of the category “sensory, miscellaneous” on the McGill Pain Questionnaire is indicated by a self-reported experience of pain as “spreading, radiating, penetrating, and piercing,” with the first word, spreading, assigned one point, and the last word, piercing, being assigned four points (Melzack 1975:281). As the scoring indicates, pain that is more widespread than specific is granted the lowest score, and as such, the lowest level of legitimation. That is, the questionnaire instructions indicate that “the higher the pain score, the greater the pain” (Melzack p. 281). As such, higher pain scores indicate that the pain intensity warrants further investigation and treatment. It is interesting to note that the questionnaire instructions also indicate that a pain score of 0 (the very minimum pain score) “would not be seen in a person with true pain” (Melzack, p. 281). The added characterization of such pain as being “true” reveals the extent to which such pain rating scales are granted the authority to accurately measure the experience of pain.

Another example from this questionnaire demonstrates the higher value placed on acute experiences of pain. The second part of the questionnaire asks how the respondent’s pain changes with time, specifically asking, “Which word or words would you use to describe the pattern of your pain” (1975:281)? The words “continuous, steady, and constant” are presented as the first level and are worth one point, while the words, “brief, momentary, and transient” are rated the highest at three points, indicating that acute pain is considered to be more intense than chronic pain (p. 281). Dr. Andrew Hershey, a neurologist specializing in chronic headaches who was interviewed for this study, corroborated this observation. Characterizing those headaches that initially developed following an accident or injury, he stated that the approximately 20 percent (qualifying this as a “small” percentage) of headaches that do not resolve within 3 months from the date of the injury defy medical explanation. Dr. Hershey further explained that
because this category of headaches constitutes a small proportion of overall headaches, the proportion of clinical research that addresses its etiology is minimal.

The NPSI was utilized in the aforementioned French study of chronic neuropathic pain as a means of investigating the prototypical evaluation of neuropathy as a “global and uniform symptom” (Attal et al. 2008:344). This inventory was developed as a self-questionnaire to “assess more specifically the different components of neuropathic pain syndromes,” such as paroxysmal (sudden attacks of) pain, evoked pain, paraesthesia (sensations such as prickling or itching) or dysaesthesia (Crawford et al. 2008:63). Additionally, it was designed to provide a more multidimensional assessment of what is considered a multidimensional condition – neuropathic pain (Crawford et al.). To attain such an assessment, the authors included items associated with various pain descriptors such as *stabbing, tingling, burning,* and *squeezing,* thereby presenting in its responses various dimensions and symptoms of neuropathic pain. Each of these items are also rated on an 11-point numeric scale in which 0 represents no symptom and 10 represents the “worst symptom imaginable” (Crawford, et al. p. 63). Items capturing the frequency and duration of pain are also included in the inventory. As the description of these items indicates, the NPSI contains similar items to the previously described McGill Pain Questionnaire.

The Pain Catastrophizing Scale was utilized by Schweinhardt et al. in the previously described Canadian study investigating gray brain matter density in young woman with chronic vulvar pain (2008). Developed by Canadian psychologists, the PCS was initially designed as a self-report measure of the relationship between catastrophizing and distress reactions (Sullivan, Bishop, and Pivik 1995). The concept of catastrophizing in this context refers to a three-dimensional model consisting of increased attention to pain-related thoughts, magnification of
the “threat value of pain stimuli,” and the adoption of a “helpless orientation” towards coping with pain (Sullivan et al. p. 525); these “psychological processes,” as identified by the authors, correspond to the dimensions of rumination, magnification, and helplessness, respectively (p. 531). The PCS manifests these 3 dimensions in the form of 13 statements that describe various thoughts and feelings that may be associated with pain; respondents are instructed to assign a numerical rating to indicate the extent to which they experience these thoughts and feelings when they have pain (Sullivan et al.). The PCS represents perhaps the most approximate test of subjective experiences of pain of the 21 articles examined for this study. Schweinhardt et al., however, chose this particular test not as much for its subjective value but rather more for its apparent, specific capability of predicting whether subjects will be experiencing more or less pain upon the receipt of a pain stimulus. In other words, this scale is another example of the attempt to specify and systematically predict the experience of pain with the exception that it is attempting to quantify psychological characteristics rather than physiological characteristics of the experience of pain and is doing so under the guise of measuring the subjective experience.

The fourth survey-based instrument used to measure pain is the Medical Outcomes Study. This survey was used in a study that concerns the treatment of osteoarthritis, particularly osteoarthritis of the first carpometacarpal joint (the thumb saddle joint). This German study examines the efficacy of leech therapy, a modality that has apparently been used “extensively to treat pain throughout medical history” (Michalsen et al. 2008:456). The authors indicate that several anti-inflammatory substances have been identified in leech saliva, thereby explaining its medicinal benefit (Michalsen et al.). Although studies have examined the effectiveness of leech therapy for osteoarthritis of the knee, its effectiveness for other forms of osteoarthritis is unknown. The selection of this thumb joint as the focus for this study is based on the
surprisingly high rate (36 percent) of osteoarthritis in this joint, in terms of the specificity of its location in the body, in Europeans age 55 and older, as estimated by a recent study cited in this article. Pain in this joint is particularly problematic for its resulting dysfunction of not only the joint but the hand as well (Michalsen et al.).

This study compared the pain-reducing benefits of leech therapy to the topical application of anti-inflammatory medication (NSAIDS or nonsteroidal anti-inflammatory drugs), administering the leech therapy to one group of subjects and topical diclofenac to another control group of patients. A total of 32 women over age 40, an admittedly small sample size, participated in the study. Although the authors did not directly specify the reason for only selecting women, in the introduction they had indicated that this pain condition predominantly affects women (Michalsen et al.). Another eligibility factor was the chronicity of the condition; subjects must have had symptoms for at least three months.

The outcome measures of the leech therapy are significant in terms of their inclusion of the Medical Outcomes Study and a relatively more multidimensional, integrated approach to the body. Although the first measure is the VAS, this standard tool is divided to account for three different statuses: pain at rest, pain in motion, and pain during grip movement. The change in the total pain score, averaged from the three, serves as the “primary outcome measure” (Michalsen et al., 2008:453). The second measure is quality of life as evaluated by the Medical Outcomes Study. Functional impairment, as assessed by the DASH (Disabilities of the Arm, Shoulder, and Hand) questionnaire, and the grip strength of the thumb joint served as secondary outcome measures (Michalsen et al.). The consideration of functional ability and grip strength as well as quality of life is reflective of the disciplines represented by the authors, physical therapy and internal and integrative medicine. As indicated in the previous discussion, the specialty of
physical therapy is particularly interested in the patient’s rehabilitation and return to functionality. It is evident here that the possible etiology of this particular pain condition was not relevant, rather the relief of the primary symptom of pain and the attendant dysfunction it causes is the primary purpose of this study. This study’s prioritization of the alleviation of pain is significant given that it represents one of the few such studies examined here, and it serves as a reminder that the practical application of biomedicine in terms of treatment continues to be of value in the landscape of publications.

The Medical Outcomes Study represents another survey-based tool that initially appears to be a more subjective measurement than those used in the remaining articles of the present study. For example, it specifically asks questions about the impact of the pain condition on the subject’s life: their activities, their energy levels, their work and social lives, and to what extent their emotional well-being has been affected. Nevertheless, the subjective nature of these questions is somewhat limited by the type of responses available – “yes” or “no” responses and numerical ratings, consistent with the type of quantitative surveys used in other studies. Therefore, the subject is not given the option of conveying the more abstract, affective, personal, and essentially, the subjective nuances of such experiences.

*The Measurement of “Real” Pain: How Researchers Quantify Extant Pain in Human Sufferers*

The remaining studies employ considerably different methods of investigating and measuring not only pain, but as professed by the authors, the experience of pain. This final category of studies is distinctive in that none of the studies conducts any experimental simulation of pain, they all employ subjects who are suffering from the pain condition of interest, and they all initially appear to transcend the typical pain rating scale to capture a more comprehensive assessment of the pain experience. As the following discussion reveals with respect to the first
two studies, this movement towards a more comprehensive assessment is nevertheless moderated by the use of survey-based instruments that yield quantifiable and therefore emotionally detached results. These two articles applied a psychological framework to their research and analysis, thereby addressing variables beyond the physiological. Interviews, self-completed questionnaires, work capability measures, surveys, and case histories served as the measurement instruments for these studies.

The first of these studies applied a psychological framework to determine the “impact of parental responses on children’s functional disability and somatic symptoms” (Claar, Simons, and Logan 2008:172). This study, authored by three psychologists with the Children’s Hospital of Harvard Medical School in Boston, surveyed the parents of children with chronic pain. The authors emphasize that their study is one of only a few that have examined parental responses to children with chronic pain (Claar et al. 2008). Consisting of a total of 327 patients between the ages of 8 and 17, the subjects were predominantly white at 91 percent and female at 75 percent. Although the race and gender of these participants may be explained by what researchers have determined to be the demographic pattern of those who seek treatment for chronic pain, the authors note that the limited heterogeneity of the subjects may limit the generalizability of the findings (Claar et al.). These parents were instructed to self-evaluate their responses to their children’s experiences of pain as being negative or positive. Although the type of pain was not an eligibility factor to participate in the study, the chronicity of the pain condition was such a factor – children must have reported having been in pain for at least three months. Specifically, the survey addressed measurements of parental responses as well their impact on children’s psychological well-being, degree of functional disability, and the level of pain experienced. The children also participated in the study, completing self-report questionnaires regarding their
physical and psychological well-being as well as participating in semi-structured interviews with a clinical psychologist in which they reported their “current pain rating” on the standard 11-point rating scale (Claar et al. 2008:174).

One dimension of this study that is inconsistent with similar such survey-based research is the absence of anonymity for the parents and children completing the surveys. The authors note that the subjects completed the questionnaires, which had been mailed to them, prior to visiting the “multidisciplinary pain clinic” for their child’s evaluation (Claar et al. 2008:174). Although the children were evaluated by a physician, physical therapist, and clinical psychologist, only the psychologist had access to and reviewed the questionnaires of the child and parents prior to meeting with them for the clinical interview. The authors acknowledge the potential influence of a social desirability bias on the part of both the parents and the children. The outcome of the operation of this bias in the survey responses of the parents and children is that of an underestimation of the parents’ negative responses to their children’s pain as well as an underestimation of children’s levels of emotional distress. Although this bias is not necessarily relevant for my purposes, I mention it to highlight the complexity and difficulty of measuring the more subjective components of pain—at least given the measurement options available.

Claar et al.’s study (2008) employs quantitative methodology and analysis to identify, specify, and subsequently sort the responses of these parents into one of three categories: protect, minimize, or encourage and monitor. The measurement of the children’s physical and psychological functioning consists of survey instruments rating levels of functional disability, somatization, anxiety, and depression. The authors conducted a “series of hierarchical multiple regression analyses” to determine the “extent to which children’s emotional symptoms (anxiety and depression) moderated the relations between parental behavior (protective, minimization,
and encouraging/monitoring responses) and children’s functional outcomes (functional disability and somatic symptoms)” (Claar et al. 2008:174). It is noteworthy that although a clinical evaluation, or what might be considered a semi-structured interview, was conducted with each patient, the discussions that such interviews entail were not presented. I am curious about the potentially rich source of qualitative and perhaps more subjective data that were not considered in the final analysis. Other qualitative methods such as observing the family in their home environment may also have provided information regarding the quality of the interactions and relationships of the family members. Although this may have been beyond the scope of their study, the authors’ employment of only quantitative data and analysis ultimately yields results that are more objective and quantifiable and, therefore, not dissimilar to the positivist framework of the clinical studies described above.

Another study that assumed a psychological framework for the investigation of the experience of pain, and chronic pain in particular, is a 2008 study authored by scientists representing the following departments at Aarhus University Hospital in Denmark: the Research Clinic for Functional Disorders and Psychosomatics, Department of Neurology, and the Danish Pain Research Center (Carstensen et al. 2008). Another author represented the Back Research Center in Ringe, Denmark. It is important to emphasize the distinctiveness of the first department listed here. A visit to its website reveals its relative dissimilarity with the scientific disciplines represented by most of the authors of the 21 articles examined here. That is, the Research Clinic for Functional Disorders and Psychosomatics, which is located in a university hospital, is specifically designed to address what it defines as “functional disorders,” or those conditions in which patients complain about physical symptoms for which there is “no adequate medical explanation” (2009). Although the website does not refer specifically to the term
“psychosomatic,” within the context it is used here it refers to those illnesses in which bodily symptoms are caused by mental disturbances (MedlinePlus, Merriam-Webster 2009). The website includes the claim that the clinic utilizes an “interdisciplinary approach” to these disorders as it applies a “psychiatric/psychological, a somatic, and a social angle” to its research. Although the term “somatic” is defined by Random House Online Dictionary simply as “of the body; bodily; physical,” it is used in this context to refer precisely to those functional, and thus psychological disorders that constitute the clinic’s focus (2009). As will be demonstrated below, it is apparent from the clinic’s claims as well as from the article examined here that this particular interdisciplinary approach necessarily invalidates any potential physiological explanations for the presence of pain.

Carstensen et al.’s limited approach to their subject is evident in their selection of and classification of risk factors for the development of chronic pain (2008). Specifically interested in the development of chronic “Whiplash-Associated Disorders” (WAD), the authors used quantitative methodology and analysis of survey data to examine the extent to which “pre-collision psychological distress and pre-collision health problems” predict the development of chronic neck pain or “reduced work capability 12 months after a motor vehicle collision” (Carstensen et al. 2008:254). For this type of pain condition to be considered chronic, symptoms must continue for at least six months (Carstensen et al.). The patients selected for this study had been referred from emergency departments or physicians after having been in a rear-end or frontal car collision and who were experiencing neck pain within 72 hours of the accident. To measure the variables of pre-collision health problems, the patients were asked three “yes” or “no” questions as to whether or not they suffered from any “pre-collision persistent illness, pre-collision unspecified pain condition, [or] pre-collision neck pain” (Carstensen et al. p. 250, my
italics). The first question asks if the patient had suffered from a persistent illness, listing several examples such as heart, lung, and kidney-related illnesses, while the second question merely asks if the patient had suffered from a persistent pain condition that had caused any lengthy absences from work.

This classification of pre-collision health problems contributes to the ambiguity of the finding that “pre-collision unspecified pain increased the odds for considerable neck pain” and reduced work capability 12 months post-accident (Carstensen et al. 2008:254). Noting that pre-collision neck pain and severity of the accident were not associated with this outcome, the researchers indicate that the finding of pre-collision unspecified pain may support the hypothesis that patients who had previously suffered from a “somatoform or similar disorder…could be vulnerable” to developing chronic neck pain after a whiplash injury (Carstensen et al. p. 256).

The key term used by the authors is “somatoform” disorder. These types of disorders are characterized by the presence of physical symptoms suggestive of a medical disorder, but which in reality “represent a psychiatric condition because the physical symptoms present in the disorder cannot be fully explained by a medical disorder” (Yates 2008). Thus, the specialty represented by the authors of this study, and in particular, the distinct approach of the functional and psychosomatic fields of medicine, provides the framework for the questions asked, the responses available, and subsequently, the interpretations of those responses. Indeed, the survey question that classified pre-collision pain conditions did not allow for any specification of the type of pain experienced, only the presence or absence of a pain condition, thereby precluding any response that indicated anything other than unspecified pain. The third question did allow the patient to indicate the presence of neck pain, but no other types of pain were allowed to be specified. The inevitable conclusion of this exercise is the finding of a psychological
explanation for what many may define as an “unexplainable” pain condition, one that is not supported by the physical evidence.

A study of pain that emphasizes qualitative rather than quantitative assessments. The final article in this genre of research is remarkable in its selection of pain conditions to investigate – that of Complex Regional Pain Syndrome or CRPS – and in its methodology and theoretical framework. This selection of CRPS is remarkable in the sense that it is the only pain condition represented here that is definitively regional, as opposed to local or specific, in its residence in the human body, with the possible exception of neuropathic pain. Its methodology and theoretical framework represent a significant departure from those of the majority of studies examined here. That is, the authors essentially employ qualitative methods to collect and analyze data, and they apply an inductive approach to their study – stating that they have a “hypothesis-generating approach” that guides their work (de Mos et al. 2008:460). Specializing in pharmacoepidemiology and pain treatment, the authors’ specialties foreground some of their conclusions (de Mos et al. 2008).

CRPS represents one of the many “contested” illnesses that occur in the general population and that occur predominantly in women. While chronic pain itself is one such contested illness, CRPS is a specific type of chronic pain that is particularly problematic. This particular characterization applies to CRPS for the following reasons: it is a condition that encroaches upon more expansive areas of the body than is considered typical among such conditions; it consists of a complex combination of symptoms; and its etiology, as with other such illnesses, is the subject of much contention. To meet the “most widely accepted” diagnostic criteria for CRPS, developed by the International Association for the Study of Pain, the symptoms of pain and sensory disturbances must be accompanied by at least one of these three
symptoms: “edema, skin blood flow abnormalities, or abnormal sudomotor activity” (excessive stimulation of the sweat glands) (de Mos et al. 2008:458). As mentioned, the etiology of this condition is the subject of much contention, but the authors note that the most recent research indicates the possible roles of inflammation, impaired circulatory systems, or neuropathic pain in the development of CRPS.

To determine the extent to which other “medical conditions or categories of medical conditions” co-occur with CRPS and therefore play a possible role in its etiology, de Mos et al. conduct a case history analysis of the health of patients “prior to the onset of CRPS” and a comparison with the case histories of a set of controls who had not developed the condition as of the date of the study (2008:459). The requirement of the Dutch Health Care System that all persons register with a general physician (even if they are healthy) who maintains individual, electronic case files for each patient allowed the researchers access to the complete medical histories of the participating subjects. de Mos et al.’s approach to this research is distinctive in its consideration of the pre-onset health of its subjects. Of those studies reviewed here that involved subjects with the pain condition of interest, this is the only such study that included pre-onset health as one of its variables.

This approach facilitates an analysis in which the issue of causation versus correlation is less ambiguous, although still worthy of scrutiny. That is, instead of inferring, for example, that depression is possibly responsible for the development of CRPS, as psychological conditions often are for such contested and unexplained illnesses, knowledge of pre-onset health may demonstrate that the depression only occurred following the onset of the illness. Even more intriguing for my purposes is the finding that psychological factors were not associated with CRPS. Somatization, another commonly theorized etiologic factor of contested illness, was also
not associated with CRPS. The authors note that of those studies that have found associations with psychological factors, their methodology was considered to be poor (de Mos et al. 2008). This study therefore represents a rather significant departure from the positivist paradigm encountered particularly in those studies that investigate similar contested illnesses. That is, the inability to objectively determine the etiology of an illness is often associated with unsupported conclusions of a psychological condition or some type of malingering. As implied by this observation, the patient is often assigned responsibility or blame for an illness that evades the clinician, researcher, or physician’s diagnostic capabilities.

*Turning the tables – focusing on the practitioners.* One article that is distinct from the remaining articles in terms of its focus and methodology consists of a literature review that examines research conducted on the beliefs and attitudes of physicians regarding the management of the condition of low back pain (Fullen et al. 2008). The distinctiveness of this study does not render it irrelevant but rather its specific focus on physician attitudes yields a tremendous amount of information on another essential dimension of the biomedical paradigm – that of the very practice of medicine and its manifestation of this paradigm. The authors of this study represent the Schools of Physiotherapy (otherwise known as physical therapy) and Performance Science and Public Health and Population Science at University College Dublin in Ireland; the Center for Physiotherapy Research at the University of Otago in New Zealand, and the Department of General Practice at the National University of Ireland. The disciplines represented provide the framework for this study given its specific focus on low back pain, a condition that represents one of the most prevalent and costly medical conditions of the general population (Fullen et al.). Although the authors state that the goal of this systematic review is to assess physician’s attitudes towards *acute* low back pain, it is apparent that these attitudes are
also significant in terms of their subsequent influence on the potential for the development of chronic low back pain.

Fullen et al.’s findings are consistent with the findings of the present study regarding the standard reductionist and positivist biomedical approach towards conditions with ambiguous etiology (2008). Evidence of this biomedical approach is noted in analyses of the attitudes of general practitioners (GPs). It was reported that the GPs encountered difficulty in predicting the risk of chronicity; additionally, GPs held “negative attitudes” towards “low back pain management due to the small [seemingly counterintuitive in terms of the GPs’ subsequent attitudes] number of patients they believed were malingerers,” fearing that they could be “legitimizing this behavior” (Fullen et al. 2008:393). They did not believe that physical therapy would be helpful to patients with low back pain, and they believed that the condition would recover spontaneously regardless of the treatment provided (Fullen et al.). GPs’ distinctive attitudes and beliefs toward low back pain lead into the subsequent finding of the impact that medical specialty has on physician attitudes and beliefs towards low back pain.

This distinction is apparent between those physicians who specialize in rehabilitation medicine, such as physiatrists and occupational physicians, and those physicians who are more general in orientation such as GPs and family physicians. According to the website of the American Academy of Physical Medicine and Rehabilitation (AAPM&R), physiatrists not only specialize in the diagnosis and treatment of pain, they also focus on restoring “maximum function lost through injury, illness, or disabling conditions,” treating the “whole person, not just the problem area;” they specialize in treating “injuries or illnesses that affect how you move” (AAPM&R 2009). This focus on rehabilitation and restoring function is evident in their beliefs about the treatment of low back pain, in which they advocate mobilization, exercise to increase
strength and flexibility, massage, specialized injections, acupuncture, and electrotherapy modalities such as ultrasound (AAPM&R 2009). Additionally, occupational physicians were more concerned about mitigating the “patient’s overall level of dysfunction” than on the “diagnosis and localized treatment of low back pain” (Fullen et al. 2008:393). In contrast, along with the above noted attitudes and beliefs of GPs, in which the validity of low back pain was questioned, family physicians did not agree with the efficacy of physiatrists’ treatments while general physicians believed that surgery was required for those patients with herniated discs (Fullen et al.).

In other words, GPs, general, and family physicians were less supportive of physical therapy or a holistic approach to the condition and more supportive of either a conservative approach to treatment or a more dramatic, localized one, such as surgery. As this last statement infers, it should be noted that there was some inconsistency in these findings. Nevertheless, the various beliefs and attitudes expressed by these physicians is indicative of the wide range of potential diagnoses and treatments encountered by patients seeking care for low back pain. In fact, the authors cite these differences as possibly contributing to the “development of chronic low back pain” (Fullen et al. 2008:394). Fullen et al.’s discussion of the impact of education on the attitudes and beliefs of physicians indicates that the absence of current medical guidelines for the treatment of low back pain contributes to the dissonance in its treatment; specifically they note findings of gaps “between clinical practice and evidence-based guidelines” (2008:394).

This is not to imply that the current movement towards such guidelines is necessarily the solution or even part of the solution, but rather to emphasize the significance of medical research and its critical role in the practical application of pain medicine.

*The Biological Property of Sex as a Defining Variable in the Study of Pain*
An example of a variable that was not necessarily an operational construct in my final analysis is that of the biological distinction of sex. Most of the studies did not directly identify the sex of the subject as a variable of interest; rather, it revealed its relevance in the findings of some of the articles. For those articles in which the findings did not indicate a difference between the sexes and even in those that did, the sex of the subject did not occupy a significant proportion of those articles’ findings or discussion sections. However, it is remarkable that sex was the defining construct in three of the studies, remarkable in the sense that in all three of these studies, a pain condition that predominantly affected women was the object of study. Although none of the studies consisted of a pain condition more common in males, one of the studies using animal subjects tested only male mice; the results, however, were intended to apply to both sexes in humans, a decision that may reflect an approach that dismisses the potential influence of this characteristic. A more detailed and focused analysis of these particular studies further demonstrates the impact of a biomedical approach to pain.

The first such study in my collection, by Falla, Arendt-Nielsen, and Farina (2008), examines the mechanisms by which the muscles of the upper trapezius adapt in response to experimental muscle pain during sustained contractions. This examination is distinguished by sex in the sense that male and female subjects were selected for comparison purposes. Because women predominantly suffer from neck pain, whiplash associated disorders, work-related neck pain, cervicogenic headache, and fibromyalgia in relation to men, the authors aimed to determine the mechanisms that differentiate pain responses in men and women, specifically to understand any sex-specific effects on motor control (Falla et al. 2008). Their study is subsequently driven by the hypothesis that “the mechanisms of adaptation of muscle activity across the regions of the upper trapezius during sustained contractions are altered by pain in a different way in men and
measurement tools employed in this study – the Pain Catastrophizing Scale (PCS), described in more detail earlier in this paper. Although the PCS is one particular method of measuring the pain experience on a more subjective level, its application in this particular study is worthy of some increased attention. Designed to determine the relationship between the psychological process of catastrophizing and distress reactions associated with the experience of pain, it classifies catastrophizing reactions to pain into the dimensions of rumination, magnification, and helplessness. The application of this type of scale to a female pain condition associated with a sexual experience seems oddly familiar and possibly representative of a conceptualization of sexual pain as being initiated or aggravated by emotional or psychological disorders. For a more
extensive discussion of such etiological characteristics, studies in which a psychological framework is applied to understand pain are discussed earlier in this paper.

The third study in which pain experienced by women was the object of study is the previously discussed study of the effectiveness of leech therapy, as assessed in women with osteoarthritis (Michalsen et al. 2008). As noted, although osteoarthritis affects men as well, the specific type of osteoarthritis (affecting a thumb joint) examined in this study predominantly affects women (Michalsen et al. 2008).

Only one of the articles examined completely failed to mention the sex of the subjects. This particular article investigated the etiology of cold allodynia and cold hypersensitivity in patients with cold injury (Namer et al. 2008). Namer et al. recruited 12 patients who had suffered cold injuries while serving in the Norwegian army in addition to 10 healthy subjects. It is surprising that no consideration is given to the potential variance specific to sex, considering that a particularly greater sensitivity to cold has often been associated with females.

DISCUSSION

Informed and guided primarily by a Foucaultian theoretical framework in addition to the work of Bourdieu, Zola, Dumit, Ware, and Bendelow, in this study I have attempted to discern the existence of themes and patterns in terms of how pain is framed within and by the biomedical community. As Foucault’s work demonstrates, medical perception consists of the use of instruments to measure and to quantify; medicine has become a clinical science defined by scientific investigation, by a positivist theoretical paradigm. This paradigm is manifested in the treatment of disease by biomedical institutions as a separate entity from the body and the body as a distinct entity from the person occupying it. Given this framework, the sign is granted greater significance than the symptom. Whereas the sign represents a physiological pathology, the
symptom is defined simply as the patient’s claim of the presence of pathology. This approach to illness epitomizes the reductionist scientific gaze of the biomedical research domain – a gaze that does not consider any other physical, emotional, or environmental factors that may influence the production and experience of pain. Guided by what may be identified as scientific materialism, biomedicine approaches its subject by objectifying, specifying, and validating physiological signs. As such, it “equates the real with the physically observable and discounts or bypasses altogether the subjective experience of the patient” (Ware 1992:356). This elevation of the sign reflects biomedicine’s theoretical vision that there exists a pure, objective, and empirical truth; this vision necessarily invalidates the innately subjective experience of the patient, thereby rendering any symptoms for which there is no identifiable sign as being of psychogenic origin, the result of overdramatization, malingering, or some other type of moral failure. The construction of one such condition by biomedicine, chronic pain, serves as the exemplar of this disturbing configuration in which the scientific authority of biomedicine acts as the powerful arbiter of truth and integrity. Because scientific research serves as the manifestation of this defining vision, in that its publications are regarded as biomedical evidence of the existence or nonexistence of a pain condition, it is these publications that have served as the embodiment of the biomedical framework that serves as the focus of this paper.

As indicated earlier, the international journal *Pain* represents one of the premiere sources of biomedical research concerning pain. Furthermore, it has been devoted exclusively to the study and treatment of pain for over 30 years. As this description indicates, this journal’s exclusive, comprehensive, and intensive approach to the study of pain represents one of the more advanced approaches to this field. Such an advanced approach yields a particularly focused and potentially *unrepresentative* examination and evaluation of pain; unrepresentative in terms of its
comparison to other biomedical journals that are not exclusive in their selection of conditions to study. For example, the preparatory fieldwork for my research consisted of considerable exposure to the following scientific journals in terms of reviewing articles concerning chronic pain and other contested conditions: *Journal of Neurology, Neurosurgery, and Psychiatry; Journal of Physiology; Lancet Neurology; Neurology; The Annals of Emergency Medicine; Anesthesiology; The Annual Review of Medicine; Occupational and Environmental Medicine;* and the *Spine Journal*, just to name a few. This exposure to a variety of other biomedical publications and their various approaches to pain and/or chronic pain revealed a salient disconnect between the biomedical findings about pain as presented in the journal *Pain* and those findings published in other types of biomedical journals.

First and foremost, the most notable distinction is that of the majority of the studies reviewed in *Pain*, there is a palpable *a priori* theoretical foundation that pain is real, indeed very real, as a scientifically established biomedical phenomenon, and as such, deserves validation and further study. Also implicit is the rejection of the hypothesized psychogenic etiology of pain, with perhaps the exception of those articles written by psychologists. That being said, there exists a rather large caveat to this foundation, which is that only certain types of pain, or certain framings of pain, are considered valid and worthy of study. The analysis of articles that comprised this study has revealed the type of pain deemed legitimate within the biomedical community: pain that can successfully be objectified, specified, and reduced to a manageable phenomenon is a legitimate type of pain for their purposes. The selection of this journal successfully facilitated the focus on and subsequent analysis of the construction of pain. As the premiere journal for the study of pain, it is certain that the articles within this journal arguably constitute the most intensive, comprehensive, and informed studies on the biomedical construct
of pain of any other publication. Therefore, it is not only reasonable but also particularly propitious to consult such a journal for the most advanced investigation and thus the most authentic portrayal of the biomedical construction of pain. This being said, this solitary focus may also represent a limitation to this study in the sense that other publications’ framing of pain potentially offer a more well-rounded portrayal of this construct in the greater landscape of biomedicine as represented in a multitude of other disciplines. Thus, future studies would benefit from analyses of the vantage point of these other publications.

My qualitative research and analysis of 21 articles that appeared in the journal over the past year yielded a detailed and instructive portrayal of the ways in which empirically-based biomedical research conceptualizes, evaluates, and constructs the phenomenon of pain. Using content and textual analysis, I was able to discern and identify a number of themes and patterns that characterized the data. As indicated earlier, the most common principles guiding the articles are objectivity, specificity, and the identification of observable signs. The selection of those variables that embodied these principles reflect biomedicine’s overarching search for pathology, a search that does not necessarily refer back to the symptoms of that pathology. The following discussion provides a detailed presentation and synthesis of the relevant findings of this study.

The first significant pattern characteristic of most of these studies was the selection of healthy human subjects and the use of experimental pain stimuli to simulate the experience or sensation of pain. These patterns represented the researchers’ overarching interest in defining the specific mechanisms associated with the sensation of pain. Significantly, several of these studies were conducted in order to better understand a chronic pain condition, four of which tested experimental stimuli on animal subjects. This configuration reflects the biomedical distinction between the sign and the symptom in the sense that the symptoms of humans with the
particular condition of interest were not relevant to the researcher’s experiment, which is not to imply that they were always irrelevant, but only that they did not contribute to the researcher’s experimental framework at the time. The use of experimental pain stimuli also reflects a very objective, specific, and positivist approach to the investigation of pain, in the sense that it serves to specify and define the physiological mechanism that is hypothesized to be responsible for pain.

As this configuration of subjects and pain models indicates, acute pain models are being used to specify the possible mechanisms responsible for chronic pain. Although there are apparent limitations to such a method, the scientific significance of such limitations is beyond the scope of this paper. The critical feature of this method is its reductionist approach to the study of a complex and multidimensional condition. To employ an acute model of pain as means by which to in turn model a possible mechanism of chronic pain invariably negates the very experience of chronic pain. To do so is to effectively propose that chronic pain is a condition that can be stripped of all its attendant features and dimensions such as fatigue, weakness, and such emotions as frustration and anger. The exclusion of these features alters the very constitution of this condition; therefore, the use of an acute model prevents an accurate representation of the mechanisms affecting its existence.

The specific orientation of the goal of each study served as another critical pattern characteristic of the majority of the articles. Whether the researchers were interested in discovering or learning more about a hypothesized etiology or in discovering or testing a proposed treatment for the condition of interest distinguished the primary types of orientations observed. The objective of the majority of studies was to either determine the validity of a hypothesized etiology for a certain pain condition or to enhance the knowledge and
understanding of the specific physiological mechanisms presumed responsible for the pain condition. As noted in the findings, many of these studies were ultimately interested in the etiology of pain in order to subsequently determine the best treatment for the specific type of pain. Further distinguishing the goal orientation of such studies was the type of etiological mechanism involved, whether it is physiological or psychological in origin. The finding that etiology provided the focus for most of the studies in addition to the observation that physiological origins were predominantly hypothesized as being responsible for pain serves as another example of the biomedical tendency to physically validate by virtue of specifying and objectifying the existence of pain. By rooting out the physiological source of pain, investigators are thereby capable of demonstrating a validated explanation for the pain.

The third critical theme of these studies was the widespread use of objective, quantifiable, and mechanical, survey, and molecular measurements of pain. With the exception of the three studies that did not employ experimental pain stimuli in their investigations of pain, all of the remaining studies employed some variation of a pain rating scale, pain thresholds, behavioral responses, or some type of mechanical instrument to measure pain and in some cases, pain-related sensations. As my discussion of the McGill Pain Questionnaire demonstrated, pain rating scales or more detailed questionnaires such as this one function to objectify the ultimately subjective experience of pain. They accomplish this by assigning a numerical value to the experience of pain, such that higher values are granted higher significance. Additionally, as the McGill form indicates, acute sensations of pain are granted greater “scores” than more persistent or chronic experiences of pain.

This type of measurement is then presented as the only representation of pain – a simple, numerical identification of pain, without any of the accompanying physical, emotional,
psychological, or environmental factors that coexist within that pain experience. Within this context then, the patient himself is merely the witness to the pathology in terms of experiencing its symptoms. Any consideration of the person as a whole being with personality, feelings, emotions, thoughts, ideas, and intellect is, for the most part, seemingly irrelevant. Indeed these studies represent the epitome of a certain kind of objectivity: as Isabelle Baszanger (1992) cogently states, a patient feels the sensation of pain, she does not objectively measure it as an engineer would assess the mathematical properties of a technical component. Nevertheless, pain is validated by questions that ask the patient to “assign a number to represent your feeling of pain on a scale of 0 to 10” rather than simply, “what do you feel or how do you feel?”

As the present study indicates, these methods of measuring pain function to quantify, objectify, and reduce the experience of pain to that of a number or a specific physiological mechanism such as electrical activity in brain tissue, the presence of gray matter in the brain, or the microcirculatory flow of cutaneous tissue. This nearly universal use of such measurement methods further exemplifies the application of the biomedical paradigm that accords primacy to the objective and quantifiable and in contrast accords no such consideration to the subjective experience of pain, or even to the less quantifiable, less localized, and less specific, but still physiological sensations such as fatigue, nausea, or weakness that may accompany the pain experience.

The localized nature of many of the conditions of interest in these studies is the fourth conclusive pattern demonstrating the biomedical framework of specificity. The presence of identifiable and manageable manifestations of pain in terms of conditions that are located in a specific part of the body reflects again the need to compartmentalize and specify pain to facilitate an empirical understanding of it. Pain that is more widespread embodies the antithesis of a
positivist biomedical framework in which pain can be specified, defined, and excluded to a
known, identifiable location on the body. The only types of pain represented among the 21
articles that were characteristically widespread or more expansive in terms of their locations in
the body were neuropathic pain and CRPS. Of course, it is acknowledged that the 21 articles
selected for this study are certainly not representative of all those articles appearing in *Pain*, and
it should be noted that my preparatory research of articles appearing in the journal did indeed
locate several articles on such conditions. Therefore, the significance of this particular finding is
not the exclusion of articles devoted to widespread pain, but rather the defining elements of those
articles that address more localized conditions.

The final significant theme identified in this analysis concerns two expressions of the
biomedical paradigm. The first factor is the disciplinary framework of the study and its authors
whereas the second is the application of more qualitative and subjective measures of the pain
experience. As would be expected, the disciplinary framework of a study reflects that of its
author. As such, it is inherent that the positivistic, reductionist, and quantifiable nature of many
of these studies is reflective of the various disciplines represented by the authors, such as
neurology, anesthesiology, pharmacology, and physiology, among others. The other predominant
disciplines represented are psychology and psychiatry. Although it is debatable whether or not
these disciplines are representative of a positivist framework, the one certain, albeit unsurprising,
observation is that of those studies in which psychological features were examined, the authors
represented these disciplines. I expected that such a framework would inherently lend itself to a
more subjective framing of the experience of pain; although this was indicated, the subjectivity
was quickly minimized by the subsequent quantitative measures used to assess it. In fact with
the exception of one or two articles, the only ones that invoked any subjectivity in their
characterization of and approach to the experience of pain were those that consisted of a psychological framework. However, as noted above, this framework did not necessarily provide the missing link of subjectivity as might have been anticipated. Instead, it served to, ironically, further demonstrate the challenges and complexity of the biomedical framework of pain in the following manner.

Where we do not have acceptable physiological explanations for the presence of pain, we instead find psychological ones. While the latter account may entail subjective characterizations of pain, this approach inherently implies the invalidation of any possible physiological etiology to the pain condition, thereby diminishing the patient’s experience of pain. For as much as the psychological and psychiatric fields of medicine proclaim the validity and reality of conditions that are classified as mental illness, there continues to exist the belief that any presence of mental illness is inherently evidence of pain that is imagined or magnified. This conviction prevails throughout the many other medical fields, scholarly disciplines, and certainly, the general public. Therefore, it serves to intensify the positivist construction of pain that dominates biomedicine.

As indicated the second critical factor in terms of these psychologically-informed studies was the use of allegedly qualitative and subjective measurements of the experience of pain. For instance, the PCS, work capability assessment, self-completed surveys including the “quality of life” survey, and interviews all apparently served to capture more qualitative and subjective experiences of pain. Although these methods may have identified a more comprehensive set of characteristics in terms of how pain was experienced by the subjects, my analysis of each of these studies revealed that several issues prevented the expected application of such tools. The PCS, for example, was used in a study of women experiencing chronic vulvar pain. This scale may represent one of the more approximate tests of the subjective experience of pain in the
present study. However, although it contains questions addressing thoughts and feelings that may accompany the experience of pain, the subjects are then instructed to assign a numerical rating to those thoughts and feelings, thereby serving to quantify a subjective experience.

Claar et al.’s study (2008) of children with chronic pain employed a quantitative approach, using self-completed surveys that rated levels of various emotional qualities and conducting regression analyses of the collected data with the intent of determining the relationship between parental behavior, children’s emotional symptoms, and their functional outcomes. As indicated, the quantitative approach mitigates the subjective representation of the respondents’ experiences. Similarly, another study using this perspective approached the study of subjects with chronic WAD using survey data and quantitative methodology. The specific discipline of the authors, that of functional disorders and psychosomatics, necessarily frames such chronic illnesses as indicative of some variation of mental illness. Emblematic of the theoretical implications of this disciplinary approach to the study of pain, the psychosomatic framework influenced the questions asked, the responses available, and the subsequent interpretations of those responses – such that the subjects’ available responses were too narrowly defined to allow any response that did not indicate a psychosomatic symptom. As demonstrated by this discussion, any consideration of the subjective experience of pain was prevented by an authoritative biomedical framework that specifies, objectifies, and reduces its subject for the presumed purpose of better understanding it.

The recurring theoretical paradigm I observed in most of these articles is what I would identify as evaluative blinders, that is, an urgency to measure, quantify, and specifically evaluate the pain experience – an urgency to objectify the subjective, to create some sort of logical, rational, compartmental, quantitative means by which to measure, and therefore, understand
pain. Ultimately, this objectification of the pain experience is consistent with the biomedical reductionist framework that defines scientific investigation.

It must be emphasized that applying a reductionist, objective, and specific framework to the study of pain is most assuredly not problematic in and of itself. Indeed, much of what we now know about pain, at least in a biomedical sense, has been advanced by this framework. Rather, it is the profound, all-encompassing application of this framework to all matters of pain, to all those who suffer from pain, and to the complete experience of pain that is potentially devastating in its consequences. That is, it does not allow for any deviation from its positivist and reductionist framework, or for any acknowledgement of the innate subjectivity of pain that cannot be grasped or comprehended by such an objective manifestation. As a consequence, those deviations from normality that do occur are objectified and constructed as not only being deviant, but also as not being legitimate or real.

With this study, I have demonstrated the challenges that pain and chronic pain pose to Western medicine and the positivist, reductionist, and objective biomedical paradigm that frames its study and practice. Biomedical research that has reached the scholarly pinnacle of being selected for publication in a peer-reviewed, scientific journal has served as the empirical data for this examination and analysis of the ways in which biomedicine determines the existence of pain. It is apparent from this research that the missing link in much of biomedical research is any viable attempt to understand the subjective experience of pain. Even more significantly, however, the resounding invalidation of this subjectivity by the biomedical paradigm inherently negates the all-consuming, profound, and often devastating impact that chronic pain has on the sufferer. To deny, ignore, or even admonish the subjective experience of pain is to deny the validity of the only person who can truly know and subsequently validate that pain. It is
therefore my hope that I have advanced our sociological understanding of this process to in turn deconstruct the ways that biomedical research, intended to uncover and better understand the pathways of pain, instead serves to delegitimate pain.
Bibliography


Filitz, Jorg; Ihmsen, Harald; Gunther, Werner; Troster, Andreas; Schwilden, Helmut; Schuttler, Jurgen; and Wolfgang Koppert. 2008. “Supra-Additive Effects of Tramadol and Acetaminophen in a Human Pain Model.” Pain. 136:262-270.


Martucci, Cataldo; Trovato, Anna Elisa; Costa, Barbara; Borsani, Elisa; Franchi, Sylvia; Magnaghi, Valerio; Panerai, Alberto E.; Rodella, Luigi F.; Valsecchi, Anna Elisa; Sacerdote, Paola; and Mariapia Colleoni. 2008. “The Purinergic Antagonist PPADS Reduces Pain Related Behaviors and Interleukin-1β, Interleukin-6, Inos and Nnos Overproduction in Central and Peripheral Nervous System after Peripheral Neuropathy in Mice.” Pain. 137:81-95.


Michalsen, Andreas; Ludtke, Rainer; Cesur, Ozgur; Afra, Dani; Musial, Frauke; Baecker, Marcus; Fink, Matthias; and Gustav J. Dobos. 2008. “Effectiveness of Leech Therapy in Women With Symptomatic Arthrosis of the First Carpometacarpal Joint: A Randomized Controlled Trial.” Pain. 137:452-459.

Morello-Frosch, Rachel; Zavestoski, Stephen; Brown, Phil; Gasior Altman, Rebecca; McCormick, Sabrina; and Brian Mayer. 2006. “Embodied Health Movements: Responses to a ‘Scientized’ World.” Pp. 244-271 in The New Political Sociology of Science: Institutions, Networks, Power, edited by K. Moore and S. Frickel. Wisconsin: University of Wisconsin Press.

Namer, Barbara; Petter Kleggetveit, Inge; Hanwerker, Hermann; Schmelz, Martin; and Ellen Jorum. 2008. “Role of TRPM8 and TRPA1 for Cold Alldynia (pain that results from a non-injurious stimulus to the skin) in Patients with Cold Injury.” Pain. 139(1):63-72.

Neddermeyer, Till J.; Flühr, Karin; and Jörn Lötsch. “Principle Components Analysis of Pain


Steenwinckel, Juliette Van; Brisorgueil, Marie-Jeanne; Fischer, Jacqueline; Verge´, Daniel; Gingrich, Jay A.; Bourgoin, Sylvie; Hamon, Michel; Bernard, Ropzenn; and Marie Conrath. 2008. “Role of Spinal Serotonin 5-HT2A Receptor in 2’,3’-Dideoxycytidine-Induced Neuropathic Pain in the Rat and the Mouse.” *Pain.* 137:66–80.


