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Psychotherapy and the Embodiment of the Neuronal Identity:
A Hermeneutic Study of Louis Cozolino's (2010) *The Neuroscience of Psychotherapy:*

Healing the Social Brain

A Dissertation

Presented to the Faculty of
Antioch University Seattle
Seattle, WA

In Partial Fulfillment
of the Requirements of the Degree
Doctor of Psychology

By

Ari Natinsky

February 2014

Psychotherapy and the Embodiment of the Neuronal Identity:

A Hermeneutic Study of Louis Cozolino's (2010) *The Neuroscience of Psychotherapy:*

Healing the Social Brain

This dissertation, by Ari Natinsky, has been approved by the Committee Members signed below who recommend that it be accepted by the faculty of the Antioch University Seattle at Seattle, WA in partial fulfillment of requirements for the degree of

DOCTOR OF PSYCHOLOGY

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Abstract

Psychotherapy and the Embodiment of the Neuronal Identity:

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Healing the Social Brain

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Seattle, WA

In recent years, there have been several ways in which researchers have attempted to integrate psychotherapy and neuroscience research. Neuroscience has been proposed as a method of addressing lingering questions about how best to integrate psychotherapy theories and explain their efficacy. For example, some psychotherapy outcome studies have included neuroimaging of participants in order to propose neurobiological bases of effective psychological interventions (e.g., Paquette et al., 2003). Other theorists have used cognitive neuroscience research to suggest neurobiological correlates of various psychotherapy theories and concepts (e.g., Schore, 2012). These efforts seem to embody broader historical trends, including the hope that neuroscience can resolve philosophical questions about the relationship between mind and body, as well as the popular appeal of contemporary brain research. In this hermeneutic dissertation I examined a popular neuropsychotherapy text in order to explore the historical fit between neuroscience and psychotherapy. The study identifies the possible understandings of the self (i.e., what it means to be human) that could arise from Western therapy discourses that are based on

neuroscientific interpretations of psychotherapy theories. The methodology of this dissertation consisted of a critical textual analysis of Louis Cozolino's (2010) *The Neuroscience of Psychotherapy: Healing the Social Brain*. The primary content, rhetorical strategies, and recurring themes in Cozolino's book were outlined and interpreted from a hermeneutic perspective. This included a historical critique of Cozolino's claims about the origins, purpose, and efficacy of psychotherapy, his assertions about the relationship between self and brain, and examples of his psychotherapy case vignettes. Rhetorical strategies in his writing included analogy, ambiguity, speculative language, and figures of speech such as metaphor and personification. A discussion of these findings addressed the implications of Cozolino's efforts with regards to patient care, psychotherapy theory integration, and the possible effects that these efforts may have on the profession of psychology. The electronic version of this dissertation is at OhioLink ETD Center, www.ohiolink.edu/etd

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Chapter I: Introduction and Background of the Problem

Introduction

Louis Cozolino's (2010) *The Neuroscience of Psychotherapy: Healing the Social Brain* integrates neuroscience research with explanations for effective psychotherapy practices. This text appears alongside over 30 other books in the Norton Series on Interpersonal Neurobiology (W.W. Norton & Company, Inc., 2013). The series of texts was inspired by the works of psychiatrist and author Daniel Siegel who, beginning with his foundational text *The Developing Mind* (1999) and through subsequent works such as *The Mindful Brain* (2007) and *Mindsight* (2010), has consolidated a vast collection of research from neuroscience disciplines into an integrative theory of human psychological and social development. Siegel's theory, branded interpersonal neurobiology, has proposed an integrated connectivity between the human mind, the human brain from which the mind is assumed to emerge, and interpersonal relationships that continually influence and are influenced by mind-brain interactions within and between individuals (Siegel, 1999, 2001). Influenced by this theory, Cozolino encourages psychotherapists to adopt (and perhaps encourage potential psychotherapy patients to request) psychotherapy practices informed by recent advances in mind-brain research that have been facilitated by recent advances in neuroimaging.

According to Cozolino, as of October 2013, approximately 25,000 copies of his book have been sold since it was first published in 2002 (the second edition was published in 2010). Twelve Thousand of those 25,000 copies have been sold in the last three years. In other words, there has been a significant increase in recent sales (L. J. Cozolino, personal communication, October 30, 2013). Portland State University now

offers a certificate program in interpersonal neurobiology that students can use for college credit, and professionals can use as continuing education (CE) credits (Portland State University, 2013).

In a relatively short period of time, the idea of a brain-based psychotherapy has become popular among psychotherapists of many theoretical persuasions. Why? What is it about neuroscience research that has become so salient for many psychotherapists and psychotherapy theorists and researchers in such a short period of time? What are the hopes that it has stirred? What is it about the language that this body of literature uses, and the larger understandings about self and society that it draws from and appeals to, that has made its findings and interpretations so alluring? In other words, what is the cultural and historical fit between neuroscience and psychotherapy? In this study I follow the suggestions of several historians of brain science (e.g., Borck, 2001; Kay, 2001; Rose, 2007; Vidal, 2009) who encourage researchers to address the above hermeneutic questions by historically situating and interpreting the primary content, rhetorical strategies, and themes in Louis Cozolino's (2010) *The Neuroscience of Psychotherapy: Healing the Social Brain*.

The Interpretive Turn in the human sciences during the 20th century led many theorists to suggest that scientific breakthroughs are often a matter of fit between the larger cultural frame and a specific theory or practice, rather than an isolated discovery removed from the history and politics of its time and place (Canguilhem, 1977/1988; Cushman, 1995; Foucault, 1966/1994; Gadamer, 1975; Kuhn, 1962). However, theorists to date have not adequately addressed the ways in which the integration between neuroscience and psychotherapy reflect the current American political and cultural

environment in which psychotherapists practice and in which this brain-based psychotherapy literature has appeared. As a result, theorists have not been able to address how the use of brain-based psychotherapy paradigms could contribute to a shift in the ways in which patients and society generally understand the purpose and process of psychotherapy, or in a larger view how the current way of being, that is, the self, is thought to be understood.

Background

In this section I discuss the convergence of historical factors that I believe contributed to the emergence of neuroscience-informed psychotherapies. I provide historical perspectives on the understandings and social arrangements from which the self is produced, and how the interest in scientifically locating the self in the material brain emerged during the modern era. I describe how current neuroscientific research emerged along with the advent of mid-20th century biomedical research, and I discuss ways that neuroscientific understandings of mind or subjective experience contribute substantially to the current way of being in Western culture. I also present philosophical and scientific challenges to how neuroscience research often depicts a materialized mind. Finally, I describe the integration between neuroscience and psychotherapy.

The self in the modern era and the emergence of neuroscience during the 20th century. An understanding of the relationship between mental and physical aspects of human beings has been a part of Western selfhood in each historical era from ancient Greece through today. Historians and philosophers (e.g., Bennett & Hacker, 2003; Vidal, 2009) often note the transition from the ancient conceptualization of nonmaterial experiences as residing external to humans, to the modern era understanding of

nonmaterial experience as located inside each embodied individual. Plato located soul (that is, the power or purpose of a physical life form) as completely nonmaterial or separate from human physicality. Aristotelian philosophy that followed Plato was significant because it did not separate the body from the concept of soul. That is, the form of matter and matter itself were considered two distinct parts of one entity. Soul in the Aristotelian sense was not a religious concept but a concept referring to the essence of an object—that is, the defining, essential attributes or functions of that object. In the view of Aristotle, the understanding of human life was not compartmentalized; rather, his was a vision of persons as immersed within social or shared context rather than distinct from it.

The modern self and the Cartesian split. The relationship between the nonmaterial and the material (or personhood and physicality) in the modern understanding of self (beginning during the 17th century) is most often associated with the philosopher René Descartes. Descartes distinguished between mental experience and physical aspects of individuals by interiorizing private mental experience within each individual. This was the basis of a selfhood characterized by a dichotomy between individual experience as separate from the physical world. According to Bordo (1987), Cartesian or modern philosophy represents the culmination of the transition to modernity during the 17th century. A foundational premise of the modern world is that the human body resides in a material world that is considered void of intrinsic meaning. In this view meaning about the world is connected to its discoverable and understandable physical workings. Subjective experience resides in a mind considered to be internal and private for each individual.

Bordo (1987) noted historical events that directly preceded Descartes' seminal 17th century writing, such as the advent of the telescope, the initial decline of church authority, and the erosion of eurocentrism by global trade, all of which threw into question many of the assumptions about the world and certainty about the purpose of humans within it. According to Bordo, it was within that general uncertainty that Descartes' philosophy emerged. Central to Cartesian philosophy was a presupposition of doubt about material existence, and efforts to overcome that doubt with certainty about existence through replicable, controlled experimentation leading to mastery over the natural world and establishment of objective and verifiable truth about the order of that world. The scientism of the modern era was marked by the vision of human beings as capable of understanding, explaining, and exerting control over nature. According to Canguilhem (1977/1988), "Descartes contradicted Aristotle's propositions point by point. For him, nature was identical with the laws of motion and conservation. Every art, including medicine, was a kind of machine-building" (p. 129). In his seminal historical account of personal identity or the concept of self in the modern era in the West, Charles Taylor (1989) outlined three primary aspects of the modern identity:

First, inwardness, the sense of ourselves as beings with inner depths, and the connected notion that we are "selves"; second, the affirmation of ordinary life which develops from the early modern period; third, the expressivist notion of nature as an inner moral source. (p. x)

Taylor (1989) described the transition from the philosophy of Plato to the modern vision of a self as a private individual who exists in a dichotomy between the individual's internal world and the external material world. Taylor wrote,

The modern epistemological tradition from Descartes, and all that has flowed from it in modern culture, has made this standpoint fundamental—to the point of

aberration, one might think. It has gone as far as generating the view that there is a special domain of “inner” objects available only from this standpoint; or the notion that the vantage point of the ‘I think’ is somehow outside the world of things we experience. (p. 131)

The modern self is a vision of human being that valorizes scientific inquiry or acquiring objective evidence of the functioning of the outer material world in order to overcome doubt about material existence. Taylor (1989) explained that Descartes’ rejection of a close relationship between scientific inquiry and morality situated moral sources within humans rather than in an inherent cosmic order designed by a higher divinity. In Cartesian philosophy, understanding the workings of a divine power or cosmic order follows from understanding the material world (which includes the human body). Taylor described how the vision of rational or instrumental control over the world and the physical body is an entire way of being that defines life in the West. He wrote,

Rational mastery requires insight, of course. . . . But the insight is not into an order of the good; rather it is into something which entails the emptiness of all ancient conceptions of such order: the utter separation of mind from a mechanistic universe of matter which is most emphatically not a medium of thought or meaning, which is expressively dead. Insight is essential to the move we can call, following Weber, “disenchanting” the world. We could also call it neutralizing the cosmos, because the cosmos is no longer seen as the embodiment of meaningful order which can define the good for us. And this move is brought about by our coming to grasp this world as mechanism. . . . We demystify the cosmos as a setter of ends by grasping it mechanistically and functionally as a domain of possible means. Gaining insight into the world as mechanism is inseparable from seeing it as a domain of potential instrumental control. (p. 149)

For Descartes, the rule of reason over passion was an essential part of the instrumental or technical control over the external or natural world because such rationality allows for an accurate understanding and manipulation of the mechanical functioning or order of the natural world. These were the foundations of dualism (a believed separation between mind and body) because the body is part of the external

material world and must therefore be studied and explained by objective scientific investigation separate from individual perspective or experience. Bordo (1987) explained that in Cartesian philosophy, subject and object are ideally without any continuity because, “the scientific mind must be cleansed of all its ‘sympathies’ toward the objects it tries to understand. It must cultivate absolute *detachment*” (pp. 103-104). Bennett and Hacker (2003) discussed how the Cartesian move of mind as separate from body suggested a personification of mind as a distinct entity that acts with the body through its connection in the pineal gland of the brain. The Aristotelian soul therefore became separate from person and reconfigured as a nonmaterial, interiorized unit that gathers information from the external world for the interiorized individual to accumulate. This rejects the assumption of a shared external world and views a compartmentalized rather than unitary mental and physical existence (as had been esteemed since Aristotelian philosophy), thereby configuring a human being who is inherently detached rather than connected to the world and other people.

Vidal (2009) argued that the brain has been one of the most important symbols of human beings to emerge from the modern era because the brain has been intricately tied to the modern concept of the self, and the study of neural processes has become strongly connected to questions that have traditionally been raised by Western philosophy. He used the term “brainhood” (p. 6) to denote the recent position that holds an individual to be defined by “*being*, rather than simply *having*, a brain” (p. 6). Vidal argued that the principles underlying the idea of the “cerebral subject” (p. 6) or the idea that self is a brain replicate the principles of private individualism that are at the core of modern Western selfhood. He wrote,

To the extent that Locke himself, in a revolutionary move, redefined “person” as a continuity of memory and consciousness, each individual’s absolutely inalienable self-ownership could in principle be attached to any substance. In practice, however, it was necessarily located in the brain as organ responsible for the functions with which the self was identified. By an intellectual mechanism involving both transitivity and metonymy—from self-functions to brain, from the part to the whole—the self and the brain became consubstantial. The individualism characteristic of western and westernized societies, the supreme value given to the individual as autonomous agent of choice and initiative, and the corresponding emphasis on interiority at the expense of social bonds and contexts, are sustained by the brainhood ideology and reproduced by neurocultural discourses. (Ehrenberg, 2008, as cited in Vidal, 2009, p. 7)

In other words, the link between body and self has had longstanding prominence in Western philosophy, yet the brain was a fitting physical symbol for the modern concept of individual selfhood. The idea that an individual is (rather than simply has) a brain represents an ontological premise, that is, a way of understanding and confirming existence. In Vidal’s view, neuroscience research therefore does not simply or unexpectedly discover connections between mind or self and brain, but instead serves as a way to validate the engrained Western belief that individual existence is inseparable from individual brain functioning. Vidal (2009) argued that “whether ontological or methodological, the belief in brain-self consubstantiality seems to have impelled brain research. The idea that ‘we are our brains’ is not a corollary of neuroscientific advances, but a prerequisite of neuroscientific investigation” (p. 7). By suggesting that neuroscience investigates an already-assumed connection between self and brain (rather than having unexpectedly discovered evidence that supports that claim), Vidal suggested that the history of how the brain became such a prominent symbol of the self in the West cannot be understood through the findings of neuroscience research. Instead, the goals, principles, and discoveries of brain science can only be understood by situating the rise of

this research in the broader time and place in which these efforts emerged. Similarly, Vrecko (2010) argued that, “the facts, theories and practices that emerge from brain research are always cultural and historical products, with particular political and economic trajectories—and should be analyzed as such” (p. 4).

Early 20th century brain science in Western societies. Historians have examined the interplay between neuroscientific research and various cultural and political trends in Western societies during the 20th century. These cultural histories illustrate ways in which the interest in the relationship between mind and brain, the science used to study that relationship, and the discourses in which that science is enveloped, are all reflective of wider social, political, and economic issues of their time and place. For example, in his history of cortical localization (that is, locating mental capacities within the cortex or outermost region of the brain) by brain scientists in Germany during the late 19th century and early 20th century, Hagner (2001) situated widespread discourses about the brain within broader political and cultural shifts during that time. Scientists portrayed the brain as the location between competing needs and drives. This partly served as a way to gain funding and raise public interest in this new science. However, the Western cultural issues that became metaphors to be physically mapped onto the brain are especially noteworthy.

Borck’s (2001) history of the emergence of electroencephalography in Germany during the early 1900s described how the electroencephalogram or EEG (an instrument that records electrical waves in the human brain) became established as a method of revealing individual personality in material form by understanding the underlying brain activity that corresponds to mental faculties. Although initially controversial among

many scientists, the EEG gained popular acclaim as a method for achieving a materialized understanding of nonmaterial aspects of human experience. Borck's account describes how measures of electricity in the brain used to reveal individual psychological experiences appealed to both modern and pre-modern understandings of human beings. According to Hayward (2001), the emergence of the EEG in Britain during the 1930s can be understood through newspaper articles during that time that suggested the machine's relevance had evolved into "a kind of truth machine or electric confessional that would reveal the occult workings of the human mind. It was a technology that materialized conscious life, transforming private mental states into public images" (p. 620). According to Hayward, through the promotion of this technology by scientists such as William Grey Walter, "the brain was pictured as a kind of hopeful, if sentimental, radar searching for comfort and stability among the random patterns of the world" (p. 626). Similar to Borck's history of the EEG in Germany, Hayward suggested that the EEG represented an ability to transcend or overcome the boundaries between private individual experience and the external world by translating inner nonmaterial experience into accessible material images.

Post-World War II cognitive science in the United States. Cognitive sciences gained prestige and academic influence in the United States after World War II. Historian Lily Kay (2001) argued that the interest in the concept of mind had waned for the first half of the 20th century. During the 1940s and 1950s, studies conducted by Warren McCulloch and Walter Pitts brought the study of mind to a laboratory brain research setting. Kay noted that from the 1940s through the 1960s, the concept of mind gained legitimacy and valor as an object to be studied, "an object of quantitative representations

that bore novel implications for the age-old queries about the relations between mind and body, the natural vs. the artificial, and for automated military technologies of the postwar era” (p. 592). She argued,

It is not “the mind” as an eternal and immutable object which McCulloch and Pitts brought into experimental quantitative research in the 1940s. It was not the same mind that, as the epitome of human consciousness and identity, had been an object of scientific intrigue since antiquity. Though some features and images have indeed persisted through the ages, the soul, psyche, anima, and mind have always been suffused with historically-situated spiritual symbolisms and cultural meanings. . . . The McCulloch-Pitts notion of mind as neural nets was reconstituted within a new space of representation—the information discourse—which emerged in the 1940s in the United States and Europe. That discourse . . . would reconfigure representations of life and society as systems of decisions and signals; it was a technoepistemic transformation across disciplinary landscape and the culture at large. (pp. 592-593)

Kay (2001) showed how the use of brain research to study the mind gained relevance in the United States and represented a convergence of a variety of historical and cultural phenomena around a belief that mind resulted of the logical patterns of neuronal activity. The mind as neural patterns represented a convergence of neurophysiology, psychiatry, philosophy, formal logic, algebra, theology, and military imagery, and it was wrapped in a new social discourse that mirrored postindustrial communication technology. As with the emergence of early brain scan technologies in Europe, the mind as logical neurons or neural nets also bridged the Cartesian divide between form and matter—that is, physical and nonmaterial aspects of human existence.

All of the cultural histories discussed above challenge mainstream histories of science that depict scientific discoveries as linear, inevitable, and able to be removed from their time and place. Traditional histories depict science as a series of ahistorical truths that explain the natural world and are automatically applicable across cultures and

eras (see Canguilhem, 1977/1988; Foucault, 1966/1994; Kuhn, 1962). Critical histories of 20th century brain science suggest that the neural investigation of mental experience has been wrapped in popular scientific and technological discourses. From these historical accounts, popular interest in brain science and technologies suggests widespread interest in an inner material sourcing of wider political, economic, and social trends. These discourses suggest a fascination with being able to observe and thereby understand individualized mental life, which had been considered private and unknowable in the modern era whose hallmark philosophical origins rested on the separation between mind and body or private and public realms. In the next section I discuss the emergence of contemporary neuroscience with molecular and genetic sciences, and the role of this brain research in the late 20th century understanding of self.

Late-20th century neuroscience as a biomedical institution. Abi-Rached and Rose (2010) discussed the emergence in the United States during the mid-1950s and early 1960s of what is now called neuroscience, and disciplinary integration between psychological theories and physical sciences, particularly molecular science. They wrote, “while there is a long history of research on the brain,”

The neurosciences formed in the 1960s, in a socio-historical context characterized by political change, faith in scientific and technological progress, and the rise of a molecular gaze in the life sciences. They flourished in part because these epistemological and technological developments were accompanied by multiple projects of institution-building. An array of stakeholders was mobilized around the belief that breakthroughs in understanding the brain were not only crucial, they were possible by means of collaborative efforts, cross-disciplinary approaches and the use of a predominantly reductionist neuromolecular method. (Abi-Rached & Rose, 2010, p. 11)

Abi-Rached and Rose (2010) argued that the emergence of the neurosciences represented a use of the brain as a new epistemology or way of understanding the

confluence of biology and psychology. Because neuroscience in its current form emerged alongside biomedical sciences during the mid-20th century, the aims of neuroscience research and intervention function at the molecular and genetic levels. Rose (2007) observed that medical research and treatment today focuses on “our growing capacities to control, manage, engineer, shape, and modulate the very vital capacities of human beings as living creatures” (p. 3). He proposed five tenets that distinguish 20th century biomedicine from the 18th and 19th century medical sciences that preceded it: A vision of life as existing at the molecular level where it becomes malleable and unconstrained by a previously assumed natural order; a focus on optimizing life rather than simply curing disease; an understanding of human being as somatic or bodily and therefore concerned with conducting life in accordance with material concerns such as preventing illness and actively participating in health care rather than passively receiving it; seeking services from biomedical experts such as genetic counselors in order to navigate medical interventions and bioethical issues; and participation in a biomedical economy by citizens who actively anticipate, hope for, and directly advocate for biomedical advances that hold promises of preventing or curing disease, or enhancing physical and mental functioning. In other words, biomedicine began to make claims that replicated Watson’s (1913) pronouncement that psychology’s job was the prediction and control of behavior.

The novelty of contemporary biopolitics arises from the perception that we have experienced a . . . qualitative increase in our capacities to engineer our vitality, our development, our metabolism, our organs, and our brains. . . . It is now at the molecular level that human life is understood, at the molecular level that its processes can be anatomized, and at the molecular level that life can now be engineered. At this level, it seems, there is nothing mystical or incomprehensible about our vitality—anything and everything appears, in principle, to be intelligible, and hence to be open to calculated interventions in the service of our

desires about the kinds of people we want ourselves and our children to be. (Rose, 2007, p. 4)

An interest in biomedical sciences has created a trend of commonplace efforts of individuals to manipulate the somatic self in accordance in whatever ways are desired.

This includes our minds. Rose (2007) continued,

While our desires, moods, and discontents might previously have been mapped onto a psychological space, they are now mapped upon the body itself, or one particular organ of the body—the brain. And this brain is itself understood in a particular register. In significant ways, I suggest, we have become “neurochemical selves.” (p. 188)

In Rose’s (2007) account, neuroscience represents the historical movement of a variety of human qualities, which were previously understood as existing within psychological space, onto the body. Moreira and Palladino (2005) described the idea of a neurochemical self as a primary indicator of Westerners’ fascination with “the endless possibilities of humanity as it finally comes to terms with its embodiment” (p. 69). Further, neuroscience positions individuals as “deeply enmeshed in a world where the staid, historical boundaries between ‘nature’ and ‘culture’ are everywhere shattered” (pp. 69-70). In other words, the vision of the self as connected to alterable neurochemical processes appears alongside the cultural preoccupation with an interest in biomedical discoveries aimed at altering, enhancing, or remedying the human body, in ways that have not previously been possible, through molecular or genomic intervention. The shattering of the boundaries between nature and culture reflects a desire for humans to be unrestricted in the pursuit of physical modification in accordance with shifting cultural norms and trends. In the next section I discuss the work of theorists who have examined

various ways that these beliefs show up in routine behaviors, self-care practices, and social arrangements in Western cultures today.

Health improvement, hopefulness, and biosocial groupings. Scholars (e.g., Moreira & Palladino, 2005; Novas, 2006; Rajan, 2006; Rose, 2007; Sulik, 2009) have discussed how the understanding of self as a somatic, biomedical individual entails an ethical regime of disease prevention, health improvement, hope for biomedical advancements, and biosocial groupings. In biosocial groupings, social participation involves activities such as advocacy on behalf of patients for advances in disease detection, prevention, or treatment. The role of biomedicine in the understanding of selfhood has also been tied to themes of hopefulness and futurity among the initiatives or research promoted by molecular and genomic advances. For example, Rajan (2006) argued that genomic research aimed at calculating disease risk fosters a public discourse that “allows us to *grammatically* conceive of life in certain ways. . . . This shifting grammar of life, toward a future tense, is consequential not just to our understanding of what ‘life’ now means, but contains within it a deep ethical valence” (p. 14). According to Rajan, the individual interest in using genomic science to calculate personal disease risk suggests that a significant aspect of subjectivity among many Westerners now involves an individual’s expected participation—as both a patient and a consumer—in markets for biomedical procedures and products.

Moreira and Palladino (2005) argued that a “regime of hope” (p. 55) is central to social groupings focused on patient advocacy and disease awareness through campaigning for biomedical research and advancements, including those promoting medical research for diseases in which brain functioning is implicated. To illustrate the

concept of a regime of hope, they analyzed patient advocacy organizations' support for continuing an experimental neurosurgical procedure for Parkinson's disease patients following highly publicized experiments during 2001 that resulted in serious physical harm for some of the American research volunteers. Similarly, Novas (2006) posited that large organizations that advocate on behalf of patients and families for biomedical research in areas such as disease screening comprise a "political economy of hope" (p. 290) in which group members engage in political participation based on a shared advocacy for biomedical advances, and a sense of hope that is not confined "to an act of the imagination, but that is...materialized through a range of social practices" (p. 290).

Novas (2006) discussed practices that are characteristic of these groups' purposes such as assisting patients and families in learning about diseases, and directly attempting to influence health policy, and noted how these types of activities brandish influence over the flow of public knowledge about medical issues, thereby linking social engagement to changes in market value of biological entities such as human tissue and blood. Rajan (2006) argued that this interplay between personalized biomedical knowledge and anticipated participation in a biomedical economy creates a particular configuration of personhood that exists at the crossroads of personal risk and market risk. In the next section I discuss how widespread images of the brain in popular media have perpetuated the understanding that self is observable through brain functioning, and neuroscience is as an authority about the self.

The influence of brain imaging on the understandings of self and personal identity in Western culture. The advancement of imaging or visualization technologies, including significant advances in brain imaging during the late 20th century, has been an

essential bridge between biomedicine and a biomedical (especially neuroscientific) understanding of self. Joyce (2008) argued that MRI (magnetic resonance imaging), which is one type of imaging used to observe the inner workings of the body or brain, has itself become a “cultural icon” (p. 2).

The technology and its benefits are often referred to in popular culture, science exhibits, news stories, and policy debates to the point that MRI can be considered a *cultural icon*—a sacred object on which revolve questions about personal health, identity, and life’s many dilemmas. (p. 2)

Joyce (2008) highlighted how MRI has become a “technology of truth” (p. 2) in contemporary culture where it is granted a position of authority even though its findings in medical settings might not be as clear or unambiguous as those findings are portrayed in popular television or movies. She argued that “the development of MRI technology and our desire to use it must be understood in relation to the broader sociotechnical turn toward visualization” (p. 6).

In a symbolic economy that equates photographic pictures with the person or object represented, medical images appear to offer the possibility of accessing the inner body without mediation to discover truth. . . . The claim of truth is staked partially on the terrain of the visual: For something to be true, it must be seen. This point is illustrated when patients with mental illness and their families support brain imaging as a way to prove to skeptical scientists and policy makers that disease exists and research funding is needed (Dumit, 2000). Culture, interest groups, and power determine whether knowledge is perceived as trustworthy, and what counts as evidence varies across time and place. (Joyce, 2008, pp. 10-11)

Joseph Dumit’s (2004) ethnographical study of positron emission tomography or PET scans (one type of imaging technology that is used in brain imaging) provides an important cultural and historical analysis of the widespread use of brain imaging and the effects of how brain images contribute to the widespread depiction of selfhood as straightforward and observable through images of the brain.

The brain scans that we encounter in magazines and newspapers, on television, in a doctor's office, or in a scientific journal make claims on us. These colorful images with captions describe brains that are certifiably smart or depressed or obsessed. . . . These brain images make claims on us because they portray *kinds* of brains. As people with, obviously, one *or* another kind of brain, we are placed among the categories that the set of images offers. To which category do I belong? What brain type do I have? Or more nervously: Am I normal? (Dumit, 2004, p. 5)

Dumit (2004) further argued that “alongside the social and institutional components of brain-fact production, we must face this question of how cultural identification and intuition coincide with these representations of reality so that we are persuaded to take them as true” (pp. 6-7). He proposed the concept of the “objective-self” (p. 7) that “consists of our taken-for-granted notions, theories, and tendencies regarding human bodies, brains, and kinds considered as objective, referential, extrinsic, and objects of science and medicine” (p. 7). The objective self entails an understanding of personhood that is greatly influenced by images of the brain and the claims attached to those images, necessarily involving a constant interplay between the claims of scientific research, the way that research is disseminated by certain media outlets, and the way that readers or consumers of that information come to embody certain understandings of human beings that are taken for granted or assumed to be true. The effects of associating brain images with expert claims about the self, and the contests between competing understandings of self that brain images replicate, “are socially embedded across spheres of activity: mass-media science journalism, mental-illness activism, courtroom admissibility, and widespread readership of published speculations, as well as neuroscientific research” (p. 13). In the next section I discuss evidence for the popular

influence of widespread brain images, and the implications of this influence on everyday activities that are part of the current way of being.

Brain improvement as self-improvement: Biomedical selfhood, lifestyle choices, and personal healthcare practices. Above I discussed Rose's (2007) interpretation of the emergence of a biomedical understanding of the self that shows up as a somatic or bodily person that exists at a molecular level where it is explainable, and receptive to disease prevention, medical intervention, and personal enhancement. For Rose the biomedical self entails a neurochemical self where mind is understandable and manipulated at the level of the brain. Other theorists (see Brenninkmeijer, 2010; Garza & Smith, 2009; Ortega & Vidal, 2007) have described the emergence and relevance of self-improvement practices that are tied to brain-improvement or cognitive enhancement. Brenninkmeijer (2010) succinctly observed that an interest in neuroscience research, "combined with the unremitting quest for a better life, has resulted in a successful self-help industry for brain enhancement" (p. 108).

Ortega and Vidal (2007) argued that neuroscientific understandings of self-improvement and health lead to lifestyle choices that are manifested in a demand for goods and services that claim to promote brain vitality, for example, "help-self manuals, brain-fitness software and computer programs" (p. 257), as well as "vitamins and all kinds of dietary support purported to enhance brain performance" (p. 257). Consumerism that is driven by the promise of brain improvement is evidence of the appeal and the authority of claims about brain health driven by an understanding of neuroimaging as expert or authority on selfhood. As an effect of neuroimaging's widespread influence, Ortega and Vidal also described the emergence of a "biosocial criterion of social

grouping” (p. 257) with regards to brain enhancement as a form of self-enhancement, evidenced by the emergence of social groups or events where membership is based on common goals such as maximizing cognitive performance or mental abilities. In one example of a biosocial grouping that places value on brain enhancement as a source of personal performance, they described the phenomenon of competitions based on mental agility such as memory championships. They also argued that biosocial groupings in general tend to be based on an understanding of self that is rooted in certain physical practices that are “structured according to criteria of health, bodily performances, specific illnesses or longevity, and they function according to criteria of merit and recognition that express values embodied in hygienic rules, activity schedules, and ideal models of the self” (p. 257). Ortega and Vidal argued that these goals represent individual or private interests, and therefore suggested that biosocial groupings are apolitical and not civically engaged. Further, the authority of brain images on selfhood is reflected not only in the self-improvement activities of individuals but also in the recent trend toward a significant role of neuroscience in humanities disciplines that were previously separate from reductionist scientific inquiry. Ortega and Vidal noted that this is a significant trend because it contributes to a view of social practices as beneficial for individual health and wellbeing.

According to Brenninkmeijer (2010), the idea that self-improvement is brain improvement involves an unusual paradox, since it requires at once a vision of self as brain, and also a vision of self and brain as separate because the self is tasked with gaining control over the brain. Brenninkmeijer argued that neither Cartesian dualism (the idea that a material brain is ontologically distinct from a nonmaterial mind) nor monism

(the view that mind emerges from the workings of the brain) accurately captures the relationship between the self and the brain that is promoted when individuals engage in activities to improve the self on the basis of improving the brain. In order to examine the understanding of self or the relationship between brain and self that is promoted by brain-improvement technologies, Brenninkmeijer analyzed interviews with practitioners and patients of neurofeedback. In neurofeedback, clinicians use electroencephalogram (EEG) to identify mental states that are associated with a reduction of psychological symptoms (or an enhancement of physical and mental performance), and then train patients to maintain those states. From these interviews she attempted to ascertain participants' expectations about neurofeedback, their understandings of proper participation in this treatment, and their understandings about the relationship between self and brain. Her results were inconclusive:

New technologies of the self give rise to new selves, stated Foucault, and in the case of the brain devices this is clearly the case. The act of manipulating the brain with a device makes people very aware of their biological constitution. First they learn that their problems are brain problems, then they see these problems visualized in their brain map, and next they interfere directly with their brains to fix these problems. In this process the brain is clearly separated from the self. But more than that, users of brain devices need more and more entities to explain their selves and their healing process. (p. 121)

From the analysis of interviews with neurofeedback patients and participants, Brenninkmeijer (2010) found that none of the broad categories of mind-brain relationship—monistic (the position that mind emerges from the material body), dualistic (the position mind and body are distinct), or triadic (a neo-Cartesian view of mind-brain-body integration) entirely capture the understanding of self or the understanding of the

relationship between self and brain that users of this brain-based treatment reportedly experienced.

Pitts-Taylor (2010) noted that although many scholars have argued that the mapping of moral and psychological questions onto brain functioning is suggestive of biological determinism, other scholars have used the concept of plasticity (the ability of the brain to change in response to its environment) as material evidence that humans are situated within a historical and social context in order to validate progressive political ideas such as agency, creativity, and non-determinism, rather than a rigidly centered modern selfhood. She rejected the optimistic use of brain plasticity as justification for progressive political views. She wrote,

The use of neuroscience does not inherently lead to determinism and can promote its opposite. But...brain plasticity positions neurological ontology not only as ever open to change, but also open to *being* changed. Plasticity is deployed to encourage us to see ourselves as neuronal subjects, and is linked to the continued enhancement of learning, intelligence, and mental performance, and to the avoidance of various risks associated with the brain, including mental underperformance, memory loss, and aging. While endorsing a view of the body/self which resists biological determinism, I find that the popular discourse on plasticity firmly situates the subject in a normative, neoliberal ethic of personal self-care and responsibility linked to modifying the body. (p. 639)

According to Pitts-Taylor (2010), the strategy of advocating for social and cultural understandings of behavior by appealing to the idea of neuroplasticity instead reinforces a biomedical understanding of self wherein morality is tied to preventive health practices, and standards of citizenship or social inclusion are tied to ideals of self-improvement and work-related productivity. She suggested that the brain as a symbol of the self is rooted in a vision of the good as modern individualism that valorizes personal gain above shared civic engagement. Her argument that the brain represents a neoliberal

self is similar to the critical interpretations of neuroscience posited by Ortega and Vidal (2007) and Vidal (2009) I discussed above. Later I examine whether neuroscience-informed psychotherapies might also reinforce an individualized somatic selfhood.

Studies examining uses of neuroscience in popular media and the psychological impact of neuroscience's appeal. Studies suggest that claims about the brain are often appealing to general audiences. Results of one noteworthy psychological study found evidence that decision-making by research participants was influenced by the presence of neuroscientific explanations of human behavior. In that study, Weisberg, Keil, Goodstein, Rawson, and Gray (2008) found that a sample of research participants who had been presented with a series of psychological explanations for common human behaviors tended to rate explanations that contained neuroscientific information most favorably even when the extra information about the human brain was irrelevant to the explanations.

In a separate study, Gurley and Marcus (2008) found that research participants serving as mock jurors were significantly more likely to vote in favor of not guilty by reason of insanity (NGRI) verdicts when they had been presented with expert testimony and neuroimaging evidence showing that a defendant's psychosis had occurred as a result of a head injury. Both of these studies provided evidence of the authority that neuroscientific claims hold over common understandings of truth and the location of the self. In Gurley and Marcus' study, the idea that the brain is the location of self also entails a vision of the brain as the location of self-control, and participants' responses suggested that this understanding of the brain mitigated notions of individual culpability. There is no question that in some cases brain injury or disease impacts behaviors in ways

that are relevant for legal and other purposes. However, these studies indicated that participants acted on the belief that there is a close relationship between brain functioning and the self, and therefore that neuroscience is an authority on the self.

The ways in which neuroscience is presented to popular audiences also has important implications for how people view neuroscience as an authority on the self, the relationship between mind and brain, and consumer demand. In a qualitative analysis of the reporting on neuroscience in popular news sources, Racine, Bar-Ilan, and Illes (2005) collected over 1200 news articles between 1995 and 2004 that featured reporting on brain science technologies. The researchers found three broad categories of techniques that journalists used in their reporting on neuroscience: Neuro-essentialism, or the conflating of self with brain; neuro-realism, or portraying brain imaging as conclusive proof of the existence of a mental phenomenon; and neuro-policy, or using neuroscience to promote a certain public policy or social practice (for other discussions of these categories of neuroscience in popular media see Racine, Bar-Ilan, & Illes, 2006; Racine, Waldman, Rosenberg, & Illes, 2010). These findings suggest that neuroscience is commonly portrayed as an authority on the self and often portrayed in popular media as the source of the self and confirmation that psychological experiences actually exist because neuroscience can observe their physiological correlates.

In this section I presented historical perspectives on the emergence of neuroscience, evidence of its popular appeal, and ways that it influences individual activities and interests. In the next section I discuss philosophical challenges to the use of neuroscience in the study of human psychology.

Philosophical challenges to mind-brain reductionism in cognitive

neuroscience. Thus far I have discussed the modern era configuration of self, cultural histories of 20th century brain science, the emergence of neuroscience in the United States with biomedicine and its subsequent effects on the self or the Western way of life, and evidence of neuroscience's current authority and societal influence. In this section I discuss how contemporary mind-brain research is embedded within the disciplinary integration between psychology and neuroscience (titled cognitive neuroscience). I review critical perspectives on how certain uses of terminology or rhetorical strategies depict close relationships (or total interchangeability) between brain functioning and human psychological experience in ways that obfuscate the distinct and possibly incompatible concepts and methods of psychology and neuroscience. In my textual analysis of Cozolino's (2010) book I examine his use of rhetorical strategies and how his grammar conceals and unknowingly perpetuates certain understandings of self.

Tallis (2004) argued that the idea that mind is reducible to the brain came about through the merger between analytic philosophy and cognitive science during the middle of the 20th century. He described the historical "capitulation" (p. 12) of philosophy of mind to cognitive science, arguing that the movement toward holding science in higher esteem than philosophy represented a backlash against the linguistic turn in philosophy. The linguistic or Interpretive Turn saw the ascent of theories positing truth as something that depends on how discourses are constructed rather than on an objective reality that philosophy is capable of understanding. He argued that the integration between analytic philosophy and the philosophy of science was premised on the hope that combining the views of various academic disciplines would result in better answers to the philosophical

dilemmas (including mind-brain dualism) that had been the subject of controversy and debate for much of the modern era.

According to Tallis (2004), “eventually, admiration for science and its methods modulated into something more subservient. Some thinkers began to agree with their more scornful scientific colleagues that in many areas of investigation philosophy was an anachronism” (p. 10). With the advancements of neuroscientific methods during the mid-20th century, the philosophy of mind strayed even further from philosophy and toward cognitive sciences. Rather than trying to understand human thought through philosophical discourse or epistemology, the study and understanding of human thought or knowledge became favored by many philosophers as an inquiry into cognitive processes and their material correlates. Rather than simply integrating epistemology (the study of knowledge) with natural science, natural science became increasingly thought of as the source of epistemological inquiry. According to Tallis, the influence of analytic philosophy was significant because this branch of philosophy dismissed the importance of the concept of consciousness or individual subjective awareness.

Tallis (2004) also situated the rise of a mind-brain lexicon during that time within emerging philosophical challenges to psychologism (i.e., the 19th century attempt to reduce logical entities such as propositions to mental states, thereby subsuming philosophy under empirical psychology). He wrote that antipsychologism “led...to a wide-ranging suspicion of talk about memories, sensations, thoughts, beliefs, and so on as if they were distinct, non-material, inner entities with an existence of their own” (p. 13). The combination of neuroscience with a philosophy of mind that disregarded consciousness and subjective experience led to the following grammatical problem:

The most striking . . . evidence of the continuing influence of the hostility in analytical philosophy to mental contents, is the vogue for theories of mind that evacuate the latter of contents of consciousness and/or equate them with linguistic or quasi-linguistic entities construed in an abstract, grammatical way. “Syntactic theories of mind” that reduce the mind to sets of rules linking inputs and outputs in a functionally effective way—offered as a “scientific” alternative to the “folk psychology” which invokes entities such as beliefs—are only the most literal expressions of this ubiquitous influence. The prominence in this Lexicon of terms such as “calculation,” “grammar,” “logic,” “rule” testifies to the after-life of Fregean ways of thought in the philosophy of mind. Only after the “linguistic turn” could philosophers be inclined to think of the mind as an ensemble of “symbol processing devices,” a “syntactic engine operating on mental sentences” and the like. (pp. 15-16)

I. Gold and Stoljar (1999) provided an overview of two different versions of what they identified as the neuron doctrine, and the implications of these two doctrines for psychology. The first version they titled the trivial neuron doctrine, noting that it is already the basis of cognitive neuroscience. It states that, “a successful theory of mind will be a theory of the brain” (p. 814). The second version, titled the radical neuron doctrine, states that, “a successful theory of mind will be a solely biological neuroscientific theory” (p. 814). In other words, theory of mind will be expressed in terms of the brain instead of merely being explained in terms of the relationship with it. The result of this would be what scholars have identified as eliminativism or eliminative materialism. Proponents of this position predict that many concepts in psychology will not be found to correspond to neural functioning, and therefore will eventually be disregarded as nonexistent. This view suggests that notions of human subjectivity will be dismissed in favor of direct brain-behavior explanations.

I. Gold and Stoljar (1999) noted that the two neuron doctrines tend to become conflated because of how authors and theorists write about brain research. That is, the neuron doctrine has two interpretations appealing to audiences simultaneously, and this

explains how the theory that mind is reducible to brain can be both widespread and controversial. According to the authors, the trivial neuron doctrine is plausible but inconsequential since psychology and its related fields of study would still exist if it were ever proven correct; however, they noted that the radical version is very consequential because it would signal an epochal defeat for psychology, even though, according to I. Gold and Stoljar, eliminative materialism is not scientifically supported. The authors posited that because of this confusion, many people often believe in the eliminativist principles of the radical neuron doctrine because they read mind-brain claims or predictions and they see elements of both doctrines at the same time. This is how audiences understand cognitive neuroscience literature as both radical and scientifically sound. Theorists (e.g., Noë, 2009) who have criticized attempts to radically reduce personhood to the human brain, have argued that the portrayal of recent neuroscientific advances as revolutionary is itself a rhetorical strategy, since it has been known for at least thousands of years that brain functioning and conscious experience are somehow related. I. Gold and Stoljar (1999) articulated how the portrayal of neuroscience as a revolutionary endeavor may unknowingly lead audiences to support eliminativism when they think they are simply showing interest in research that seeks to find the neural correlates of mental events.

Scholars such as Bennett and Hacker (2003), Brothers (2001), and Tallis (2004) have argued that in many ways the scientific study of the brain is logically incompatible with the study of psychological concepts. These scholars criticize cognitive neuroscience, which is the subfield of neuroscience that studies psychological concepts by identifying their corresponding neural structures and functions (other branches of neuroscience

emphasize the study of the material brain for disease treatment and other scientific reasons). Bennett and Hacker rejected the methodological premise of cognitive neuroscience on the basis that combining psychology and neuroscience confuses conceptual and empirical questions. They explained that conceptual questions are concerned with “forms of representation” (p. 2), that is, what does and does not make sense, and these questions precede empirical questions addressed by scientific study, which seeks to answer a question that is empirically true or false based on the conceptual issues that were already assumed. Thus, a scientific investigation hoping to yield an answer to a question that was unknowingly based on a conceptual error is a flawed experimental design that produces meaningless results. They argued that cognitive neuroscience, which attempts to answer psychological questions in terms of their underlying neurophysiology, is based on a conceptual confusion. In their view, while neuroscience can answer questions about the correlations between psychological functioning or impairment and neurophysiological functioning or impairment, neuroscience cannot replace psychological concepts or explanations with neurological concepts or explanations, and it cannot explain psychological abilities as abilities of the brain.

An important part of Bennett and Hacker’s (2003) expansive survey of the history and philosophical bases of mind-brain research is their discussion of what they call the mereological fallacy, or ascribing qualities to a part of an entity that can only apply to the entity as a whole. According to the authors, this becomes the mereological principle of neuroscience when psychological predicates are ascribed to brains, since psychological predicates were intended to describe people. According to Bennett and Hacker, early-

20th century brain researchers were largely Cartesian dualists because they attributed certain human qualities or abilities to the mind rather than to humans, thereby using language that kept mind or nonmaterial mental experience separate from brain or neurophysiological functioning. More recently, they argue, neuroscientists have claimed to reject mind-body dualism by using language that ascribes human qualities to the brain instead of ascribing them to the nonmaterial mind. According to Bennett and Hacker, it is not simply that it is inaccurate to attribute abilities such as thinking or remembering to an entity such as the brain rather than to humans; rather, it actually makes no sense to do this. To say that it is inaccurate implies that it is testable or disprovable, whereas the idea that the brain rather than humans perform uniquely human tasks, or possess uniquely human attributes, is unable to be confirmed or disconfirmed through scientific inquiry. They noted that psychological concepts are difficult to define, but they are attributes of whole beings, they represent common understandings of persons (and some animals), and psychological concepts are not theoretical concepts. Therefore, believing that it is still unknown how mental and physical aspects of life are related (the premise of much neuroscientific study) is an “illusion” (Bennett & Hacker, 2003, p. 119). Psychological concepts do not necessarily separate mental from physical in their descriptions of people, and therefore they are already adequate descriptions of how humans and animals “have the kinds of capacities that characterize them” (p. 119).

Brothers’ (2001) rejection of cognitive neuroscience is based on the same logical argument. She noted that although neither psychology nor hard sciences can be extracted from the social practices within each area of study, psychology studies concepts that have ancient roots and involve ideas about personhood which exist because those ideas are

agreed upon by the community studying them. Hard or natural sciences, on the other hand, use the relatively recent scientific method to test theories about a physical external world by rejecting false hypotheses. Concepts related to mental experience exist in the realm of the social, and whether or not a statement about something involving human psychology is true is largely determined by whether a group of people agrees that the statement is true in the circumstance in which it is made. In other words, it can be argued that psychology does not study the workings of the external or natural world.

According to Brothers (2001), even empirical or scientific psychological experiments depend on operationalizing concepts in a way that ultimately rest on however a certain community agrees upon the definition of the concept being measured, rather than resting on the observation itself. Conversely, natural science is based on a belief in the existence of a physical world that is external to the people making observations about it. Therefore, psychology is not a science according to the traditional definition of a science because the truth of a psychological statement does not ultimately rest on observations of an external material world (even though psychology presents itself in a way that combines mental concepts and objective material discourse). Psychological studies require attributing motivations to the subjects being studied and therefore psychological statements depend upon other psychological statements, not upon observations of a material object (in psychology, the object of study is a person). For example, the study of a concept such as depression requires a community of people agreeing upon what that concept means and ways to interpret whether a person is exhibiting it. But logically it is not the person or subject who is being studied; what is being studied is a quality or attribute of that person, even though psychological concepts

are embedded in everyday language, and in everyday language psychological concepts typically describe whole persons, not just their mind or mental state.

According to Brothers (2001), it is easy to forget that simply because the general, everyday understanding of a person is that a person is an entity who is both mental and physical, this does not mean that it is easy to combine the two distinct fields (psychology and neuroscience) that each study one of those parts of humans. This is why cognitive neuroscience is able to exist. As humans we go about our daily life and think or talk about people, but we do not think or talk about them as a mind or as a brain. The word person assumes that a set of mental and a set of physical qualities are present. So in order to accept cognitive neuroscience claims about the relationship between mind and brain, one must assume that the study of the mental and the study of the physical can go together as easily as the mental and physical go together when we think or talk about people in normal everyday grammar.

Since psychology and neuroscience have separate histories, vocabularies, concepts, and research methods, rhetoric or grammar has to fill in the gaps. Brothers (2001) identified rhetorical strategies that are often used in cognitive neuroscience literature to do that (she also noted that at times authors acknowledge uncertainty about the mind-brain relationship and suggest that these questions will be answered with more neuroscience research; or, some neuroscientists solve the mind-brain problem with eliminativist claims that psychological concepts are fictions and the concept of mind is a placeholder for neuroscientific explanations of behavior).

For example, Brothers (2001) noted the strategy of using everyday words to describe both psychological concepts and brain activity, which ignores the separate

contexts of each of those fields. She observed, “ignoring the contexts makes it look as though there is no hard work involved in equating the brain and the mind” (p. 15). A common example is the use of Freud’s concept of the unconscious by neuroscientists to imply a relationship between psychoanalytic theory and neuroscientific research even though the idea of the unconscious mind had nothing to do with the fact that brains and body typically function outside of awareness. Another strategy is the use of analogy to portray brain structures as mirroring the way psychological experiences are conceptualized. In other words, “the complex everyday grammar of a mental term is discovered in the brain itself. The discovery, of course, depends on constructing appropriate narratives of brain architecture” (p. 19). For example,

The widespread idea that socialization and rationality constrain our primitive natures is often recast as the dominance of the cortex over subcortical brain structures. This oversimplified, ideologically based idea about brain structure is then used, circularly, to prove the cultural idea. (p. 19)

Because brain functioning (in this case the cortex) is not entirely understood by scientists, this type of argument is able to depict brain functioning and cultural values as fitting perfectly together as if the brain causes those cultural values to exist through its functioning. These narratives therefore function to naturalize social values and mores. Another strategy is to present a new narrative as a neuroscientific discovery—in other words, to portray brain functioning as having proved something previously unconsidered in psychology such a relationship between some mental or affective concepts that had not previously been recognized. The problem is that the psychological narrative preceded the interpretation of brain structures acting in a certain way, which then proved the narrative that an author is trying to construct (see also Bennett & Hacker, 2003).

Brothers (2001) argued that the reason cultural narratives can be easily mapped onto the brain is because, although neuroscience uses natural science methodology to study a physical object, neuroscience lacks a central organizing theory against which to test hypotheses, even though a central theory is a standard in other sciences. Scholars (e.g., Atmanspacher, 2007; Uttal, 2007) have noted that psychology also lacks a central organizing principle unifying its numerous and often unrelated sub-disciplines. According to Uttal (2007), psychology will always be questioned as a legitimate science as long as its terminology (e.g., concepts such as mind or consciousness) are too numerous in quantity and often ambiguous in meaning. Uttal reminded readers that some theorists do not consider these issues to be problematic, and some theorists do not consider these issues to entirely negate the argument that psychology is a science. Regardless, he argued that in order to compensate for the perceived problem of psychology not being a science, psychologists often take abstract concepts regarding mind or mental life and describe them as physical in order to make them seem observable or quantifiable entities. In fact these mental-physical associations are actually figurative or metaphorical ways of talking.

Brothers (2001) concluded by cautioning against two potentially harmful effects of the attempt to use cognitive neuroscience to overcome the mind-body split of Cartesian or modernist philosophy. First, describing problems in terms of the brain makes it more difficult to attribute those problems to unfair social and economic arrangements. Second, brain-based understandings of self are transferred from an expert class to society more generally, and therefore the authority of neuroscience suggests a process of turning

control of human nature (and beliefs about how people change) over to the opinions of a few high-status scientific experts.

Uttal (2007) argued that evidence of psychology's reliance on the material concepts of other scientific fields can be found in noticing that over the last century, psychology has periodically adopted anew whatever latest technologies or machines are popular to use as a metaphor for the mind, leading to the computer metaphor for mind in cognitive psychology. Even more problematic is how psychology's borrowing of material understandings of other sciences to serve as accessible metaphors for mental processes has caused a reification or seemingly literal understanding of concepts that are actually nonmaterial. He suggested that the fusion between neuroscience and psychology is itself a good example of this because the functions of the neuroscience technologies have often become adopted as actual psychological theories rather than methods for answering specific psychological questions under investigation. For example, in psychology's mind-brain research the use of EEG recordings led to electromagnetic or field theories of mind whereas the use of fMRI images reinforces a view of mind as localized in the brain.

What was a well-defined problem in physics, information processing, or medical pathology often becomes an entrenched paradigm of psychological research with all of the accoutrements of a scientific endeavor but without adequate consideration of the seductive call of what might well have been an ill-connected metaphor. (Uttal, 2007, p. 64)

Tallis (2004) called this problem "thinking by transferred epithet" (p. 34), and he used that issue to deconstruct common terminology that is used to portray the mind as analogous to the functioning of various technologies, yet which have come to be incorrectly understood as literal descriptions and explanations of the mind. He suggested that this association between mind and machine is based on (and constantly reinforces)

the view that neuroscience has already explained or will explain the phenomenon of consciousness. In other words, Tallis argued that technological terms reinforce the premise that mind is brain by reinforcing the idea that mind functions like machines. This happens to be a largely unquestioned part of typical parlance since machines are generally anthropomorphized in a variety of ways that unknowingly (and incorrectly) attribute to them qualities of being conscious, free-willed, human-like entities that think and perform tasks. Like Uttal (2007), Tallis (2004) noted that the ambiguity of psychological concepts is one reason for the persistence of material misrepresentations of mind. For example, concepts such as calculation, complexity, goals, and instructions are concepts that are often used to describe the functioning of machines such as computers, yet are also applied by cognitive psychologists to describe mind (or to describe how the brain works to produce the mind).

Like Brothers (2001), Tallis (2004) is also a physician who has conducted neuroscience research yet is vocal in his criticism of the neuroscientific study of psychological concepts. He is primarily concerned with the disregard for the concepts of consciousness and subjectivity that a reductionist neuroscientific understanding of human psychology frequently depicts. His concern is that attributing all human experience to the brain tends to overlook many of the important philosophical and social issues that those questions have traditionally been thought to raise. In his view, the neuroscientific vision of self is ultimately a scientific, Darwinian understanding of humans that is uncomplicated and boring. Further, the understanding of a mechanistic, material self, when described in ways that neglect concepts such as consciousness or subjectivity, ultimately portrays humans without agency or self-directedness.

In sum, critics of cognitive neuroscience have argued that using neuroscience to locate psychological concepts within neurobiological processes is illogical and therefore requires using rhetoric or grammar in ways that make nonmaterial concepts seem either interchangeable with, or able to be easily mapped onto observable physical correlates. Critics also suggest that cognitive neuroscience, despite its popularity, and despite promising an explanation of how humans experience life in both physical and nonphysical ways, often naturalizes and individualizes social and philosophical issues. This has significant consequences for what people understand to be the location of human experience, difficulties, and change. In the next section I discuss the integration between neuroscience and psychotherapy.

A brief history of arguments supporting the integration of psychotherapy and neuroscience. In this section I discuss ways in which authors have portrayed neuroscience as having the potential to help therapists discern among the multitude of psychotherapy theories, select appropriate treatments, and measure the effectiveness of these treatments for third-party payers who often hold significant control over the delivery of mental health care. These issues have been identified in psychotherapy literature as explanations for why various psychotherapy-neuroscience integration efforts are necessary.

Integration of psychotherapy theories. In light of the expansive number of psychotherapy theories, the question of which psychotherapy treatment should be provided to which psychotherapy patient has not been easy to answer. The integration or combination of separate therapy theories has been driven in part by research findings suggesting that most psychotherapies seem to confer equally helpful results for patients,

and, in general, most patients seem to respond well to psychotherapy for reasons that are similar regardless of the specific therapy modality (Norcross & Newman, 2003). A second attempt to resolve this dilemma was the creation of evidence-based treatments specifically tailored for psychological disorders, and with the purpose of maintaining verifiable and replicable psychological treatments.

The history of psychotherapy integration includes the initial decline of psychoanalysis' prominence during the mid-20th century, which had significant implications for professional psychology. Cushman (1995) noted a split even within psychoanalytic theories during the 1940s following the death of Sigmund Freud. Although now widely regarded as a flawed study, Hans Eysenck's seminal study during the 1950s, which claimed to find psychoanalysis ineffective as a mental health treatment, was thought to have catalyzed the drive to implement alternative psychological approaches (Goodwin, 2008). Lazarus (2005) argued that in professional psychology journals, disagreements between various schools of practice within professional psychology were evidenced at least as early as the 1960s, and were initially pronounced in expert debates between psychoanalysis and behavioral models of treatment for psychological conditions. During the mid-to-late-20th century psychotherapy experienced a proliferation of psychotherapy theories, at times accompanied by noticeable disagreements between the experts affiliated with them, and competition for professional legitimacy among advocates of separate paradigms (J. Gold & Stricker, 2006; Miller, Duncan, & Hubble, 1997; Norcross, 2005). Today psychotherapists continue to confront the challenge of understanding and selecting appropriately from among a multitude of psychotherapy modalities. According to Barker (2001),

For over 30 years society has been drowning in psychotherapies. Where psychoanalysis once strode confidently, alone, now the path to the client's door is beaten by a Technicolor assortment of approaches, models and interventions, some with only the most tenuous attachments to the five main forces of psychological thought. (p. 11)

Miller, Duncan, and Hubble (1997) suggested that contentious disagreements among advocates of specific psychotherapy theories and modalities might be attributable in part to financial interests of authors who have sought to differentiate new products from already-existing yet similar treatments. They also noted the pressing need among psychotherapy providers to prove to third-party payers that the reliability and verifiable effectiveness of treatments administered with psychotherapy patients. Formal integration between psychotherapy theories has been a prominent late-20th century psychotherapy trend. According to Goldfried, Pachankis, & Bell (2005), the origins of psychotherapy integration could be seen as early as the 1930s when some theorists proposed a convergence between certain principles of psychoanalysis and the emergent behavioral models of treatment for psychological conditions. Psychotherapy integration offers an alternative to psychotherapists promising allegiance to any one psychotherapy approach. One of the goals of psychotherapy integration has been the discovery of areas of convergence among various effective psychotherapy models in order to “create theories and practices that are superior to the existing pure-form models” (Lampropoulos, Spengler, Dixon, & Nicholas, 2002, p. 1228). With the hopes of improving psychotherapy overall, some authors have suggested that psychotherapy integration might curtail the disputes among competing schools of psychotherapy with regards to best practices in therapy (Alford & Beck, 1997).

The finding that many treatment approaches have the potential to confer similar benefits upon therapy clients is now commonly understood among professional psychotherapists to be a driving factor behind the movement for multi-theoretical or integrative approaches to psychotherapy treatment (O'Brien & Houston, 2007; Prochaska & Norcross, 2003). As theoretical integrationists seek to determine the most efficacious psychotherapy modality for each patients' presenting problems (Norcross, 2005; Stricker & Gold, 2006), integrative modalities have, by some survey measures, constituted a significant portion of professional psychotherapists' identified psychotherapy approach (Norcross, Karpiak, & Lister, 2005; Prochaska & Norcross, 2003). According to Nuttall (2002), psychotherapy integration represents a convergence of historical factors in professional psychology, including the influence of a postmodern worldview that questions the idea of singular or objective truth; the need to prove cost-effectiveness of psychotherapy treatments to third-party payers; and the need to efficiently train providers to be able to identify the needs of individual clients and maintain flexible treatment approaches. As a primer to his multitheoretical adult psychotherapy guide, Brooks-Harris (2008) similarly argued that the movement toward theoretical integration has probably been a result, in part, of emerging postmodern approaches driven by constructionist, systemic, and cognitive theories. Evidence of this argument can be seen in humanistic psychotherapists' adopting experiential techniques, as with the emotional-focused therapy recommended by Leslie S. Greenberg (Elliott, Watson, Goldman, & Greenberg, 2004); psychodynamic theorists adopting interpersonal techniques, such as the cyclical psychodynamic paradigm by Paul Wachtel (1993); and the well-known merger of numerous cognitive and behavioral psychotherapies which have included dialectical

behavioral therapy created by Marsha Linehan (Robins, Schmitt, & Linehan, 2004) and acceptance and commitment therapy (ACT) devised by Steven Hayes (2004).

The effects of managed care organizations (MCOs) on professional psychology and psychotherapy. The emergence of managed care organizations (MCOs) and their strict oversight of patient care has also factored prominently among the difficulties that psychologists and psychotherapy have faced in the delivery of services over the last several decades. Managed care organizations, which are private health insurance agencies, emerged during the 1980s and placed barriers to financial compensation for mental health services such as restrictions on reimbursable psychotherapy methodologies, and limitations on the number of psychotherapy sessions for which patients might receive coverage (Cohen, 2003; Panzarino, 2000). The emergence of short-term psychotherapy approaches and the efforts to devise methods of measuring psychotherapy progress has since been ubiquitous (Cushman & Gilford, 2000; L. M. Richardson & Austad, 1991). Authors have suggested that long-term psychotherapies, which seem more likely to address clients' longstanding behaviors or personality characteristics within the context of the therapeutic relationship, have often been discouraged by managed care guidelines (Cushman & Gilford, 2000; Ragan, 2006; Sperling & Sack, 2002).

Authors have also noted the social, ethical, and practical difficulties cause by managed care oversight for mental health services. For example, Braun and Cox (2005) noted the ethical and legal challenges that have arisen as clinicians, confronted with managed care restrictions on clients' coverage, might have intentionally or unintentionally misrepresented a client's diagnosis or treatment in order to provide reimbursable treatment. Discrepancies in therapists' diagnoses of patients based on

payment method has been studied and reported elsewhere (see Kielbasa, Pomerantz, Krohn, & Sullivan, 2004). Cushman and Gilford (2000) described the social implications of managed care organizations' regulatory control over psychotherapy approaches and preferred diagnostic categories, and the surveillance by MCOs over the relationship between psychotherapist and patient. They argued that the mandates of managed care companies promote an uncomplicated understanding of complex human problems, and therefore has the potential to result in psychotherapy practices that indirectly promote political values consistent with conformity or compliance to authority. Wilcoxon, Magnuson, and Norem (2008) further proposed potential implications of these types of inflexible psychotherapy practices during the mental health treatment of minority clients. Managed care limitations on reimbursements for psychotherapy providers also coincided with the increased use of psychiatric medications, against which psychotherapists have frequently found themselves competing as treatment providers (Linford & Arden, 2009). Linford and Arden also argued that psychotherapists have often struggled to define or explain succinctly the factors that comprise the quality of the psychotherapy experience, whereas advocates for psychiatric medications have been able to explain the efficacy of their treatments as an assumed correction to chemical imbalances.

Applying neuroscience to psychotherapy integration and validating psychotherapy efficacy. In psychotherapy articles and books, authors have advocated strongly for a continued and growing relationship between psychotherapy and neuroscience. One argument suggests that psychotherapy research that uses brain imaging has the potential to identify effective psychotherapy practices and allow

psychologists and psychotherapists to have confirmed scientific explanations of the purpose of therapy. According to Beitman and Manring (2009),

Psychotherapy may be leaving its prescientific state as neuroimaging and specialized electroencephalograms of brain function help to define the neurophysiological bases of psychotherapeutic change. As therapists theorize, their theories will be increasingly testable by concrete brain mapping. Such work will challenge therapists to learn that mind and brain are not separate but are different aspects of the same thing. (p. 713)

Similarly, Linden (2006) argued that “psychotherapy needs to be based on a sound understanding of the biological processes involved. There is no reason why this general standard of contemporary medicine . . . should not apply here as well” (p. 528). According to Fonagy (2004), “non-biased, non-subjective measures of outcome are urgently required. Neuroscience (particularly brain imaging) will deliver this sooner rather than later” (p. 357). These statements seem unwavering in both the convictions about the importance of integrating neuroscience with psychotherapy, as well as the attitude of certainty that neuroscientific methods will indeed become increasingly intertwined with the specific practice of psychotherapy and the general understanding of its purpose and efficacy.

Authors (e.g., Beitman & Manring, 2009; Beitman & Viamontes, 2006; Porto et al., 2009; Toomey & Ecker, 2007; Walter, Berger, & Schnell, 2009) have argued that the use of neuroimaging technologies in psychotherapy research could prove which psychotherapy theories (and which common factors amongst various psychotherapy theories) are most efficacious for brain change and therefore worthy of being recommended as psychological treatments. The assertion is that such neuroscientific research would provide conclusive evidence as to which therapies are least effective,

consolidating the myriad of psychotherapy theories into sets of precise interventions for specific clinical problems. For example, Linden (2006) proposed that neuroscience might contribute to these professional goals because “a better understanding of . . . biological mechanisms might aid in the improvement of therapeutic interventions or even in the utilization of these very mechanisms, as in the case of neurofeedback” (p. 528). In their neuroscience-informed understanding of the purpose of psychotherapy, Beitman and Viamontes (2006) argued that “a pragmatic look at the psychotherapeutic interaction suggests that it is a relationship between two brains and their bodies” (p. 214). Beitman and Viamontes predicted that by utilizing neuroscience in psychotherapy research, “psychotherapists will be able to visualize the brain processes that underlie both psychopathology and psychotherapeutic change” (p. 214). These statements materialize psychotherapy by reducing psychotherapy theory and practices to the brain.

Broadening the scope of established psychotherapy theories. Psychotherapy theorists have used neuroscience research in an effort to either verify the accuracy of already-existing psychotherapy theories’ models of behavior and change, or to overcome limitations to well-known psychotherapy paradigms by broadening the scope or utility of those theories. In other words, the appeal to neuroscience is very wide. For example, with regards to remedying the purported decline in prominence of psychoanalytic theory, seminal neuroscience researcher and psychiatrist Eric Kandel (1999) has encouraged psychoanalytic therapists to embrace neuroscience research as proof of psychoanalytic interpretations of memory, consciousness, and mind, and to portray the aims of psychoanalysis as convergent with the aims of neuroscientific research in those areas. Kandel argued that such a merger between psychoanalysis and neuroscience could

potentially reverse what he described as the declining influence of psychoanalytic ideas within professional psychological practice. Boag (2007) similarly declared, “the significance of this direction for psychoanalysis cannot be overstated. . . . The venture into neuroscience makes possible the further evaluation of some of the fundamental concepts within psychoanalytic theory” (p. 376). In one article, Ragan (2006), a physician and psychoanalytic practitioner, bemoaned his experiences of being instructed by managed care agents to avoid discussing transference issues with therapy patients in order to avoid issues that might lead to patients’ regression and possibly lengthier courses of therapy. He argued that by appealing to neurobiological evidence for its theories, “psychoanalysis can join the ranks of those fields claiming a modicum of ‘objective’ and ‘subjective,’ ‘rational,’ and ‘hierarchical’ understanding of the essential workings of what it is to be human” (p. 643).

In a different application of neuroscience to psychotherapy, Ilardi and Feldman (2001) proposed that the study of the neural correlates of mental activities could serve to widen behavioral psychology’s limited disciplinary boundaries. Noting that behaviorists traditionally have assumed that behavior is largely determined by an individual’s environment and that behavior is measured with observable individual actions, Ilardi and Feldman argued that advances in neuroimaging may allow for observations of mental states, thereby broadening what is considered to be observable phenomena. In another unique application of neuroscience to an effort to expand the scope of psychotherapy theories, Cromby (2004) argued that psychotherapies based on social constructionism should incorporate brain-based explanations of subjectivity in order to incorporate the idea of physical embodiment into their understanding of human beings. He argued that

some contemporary psychotherapy theories have become extreme in their view that reality is ambiguous, in effect perpetuating an understanding of mind and body as separate even though constructionist theories had been incorporated into psychotherapy to challenge mind-body dualism. Cromby argued that incorporating supposed physiological correlates of mind into social constructionist approaches could therefore enable these psychotherapies to “more profoundly challenge the cognitivism and individualism of mainstream approaches” (Cromby, 2004, p. 817). These theorists’ efforts all suggest a materialization of mind and other psychological concepts. The variety of ways in which these theorists appeal to neuroscience to resolve an array of challenges in psychotherapy theory is also noteworthy.

Authors have suggested that neuroscience research might eventually contribute to an overhaul of dichotomous classifications between physiological processes and mental disorders, anticipating that the relationships between molecular and cognitive levels of functioning will be identified (see Linden & Fallgatter, 2009; Mizen, 2005; Peres & Nasello, 2008). For example, Linden and Fallgatter (2009) suggested that, “classical concepts of mental disorders such as schizophrenia have been variously attacked as being too broad or too narrow. Here, the hope is that neuroimaging may contribute diagnostic markers to support or refute existing categories” (p. 1). Similarly, according to Peres and Nasello (2008), “functional neuroimaging technologies are perhaps the most important of several recent developments that promise to correct, or even eliminate, the rigid classification of disorders as neurological, psychiatric, or psychological” (p. 944). These goals seem ambitious and assume theoretical integration among various understandings

of psychopathology in order to facilitate broadly agreed-upon understandings of psychology distress or discernible mental illness.

Statement of the Problem

Despite the significant role of neuroscience and mind-brain research in the contemporary understanding of self, there has been a relative absence of studies that critically examine the integration between psychotherapy and neuroscience. There has been a convergence of historical and political developments in Western culture that has led to the formation of contemporary neuroscience. Several philosophical and scientific controversies have emerged about cognitive neuroscience's efforts to study psychological concepts by identifying their neural correlates, and yet there has been a relative absence of critical analyses of the integration between psychotherapy and neuroscience in the literature. Therefore, there is a need for a cultural and historical interpretation of a neuroscience-informed psychotherapy text based on a careful analysis of the claims and rhetorical strategies used to integrate mind and brain or psychotherapy and neuroscience.

Description of the Study

Specifically, in this hermeneutic study I historically situate a brain-based psychotherapy text. I first conduct a textual analysis of Louis Cozolino's (2010) *The Neuroscience of Psychotherapy: Healing the Social Brain*. In that analysis I discuss examples of the primary content, rhetorical strategies, and recurring themes in the book. I then examine the implicit cultural and historical assumptions in Cozolino's claims and recommendations, and I discuss ways in which he used linguistic devices to identify psychotherapy with neuroscience. Finally, in Chapter V I discuss the implications of the

text for professional psychology and psychotherapy, and the broader economic, political, and social arrangements that the text at once embodies and replicates.

Rationale for the Study

This project could bring greater attention among psychotherapists and general audiences to understandings about the self that are unknowingly perpetuated in a brain-based psychotherapy discourse. As a hermeneutic study of a psychotherapy text, it is assumed that certain understandings about the self or what it means to be human are present in the text's claims about psychological health, illness, and approaches for facilitating healing. Hermeneutic philosophy is an interpretive framework for understanding how healing practices embody and then replicate certain sociocultural trends and moral understandings of a historical time and place. Revealing the understanding of the self in a brain-based therapy theory is necessary for understanding the political, economic, and social arrangements that are promoted in a brain-based therapy discourse.

Importance of the Study

This study is important because it could contribute to a substantive dialogue within professional psychology and psychotherapy about some of the possible implications of a brain-based psychotherapy discourse for patients and for the larger societal understandings of issues such as psychological health and illness, as well as the purpose of psychotherapy. Because of the relative absence of critical interpretations about brain-based psychotherapy theories despite well known but separate critical historical examinations of both psychotherapy and neuroscience, this study attempted to bring attention to some of the underlying values, assumptions, and lifestyle choices that brain-

based psychotherapy discourses reinforce, and that authors of brain-based psychotherapy texts (and psychotherapists employing their recommendations) might have overlooked.

It is clear from a review of the literature that authors who support the integration between neuroscience and psychotherapy have many hopes that neuroscience will resolve some longstanding yet unresolved issues such as how best to explain psychotherapy's effectiveness, and how to select or combine psychotherapies for the treatment of a specific patient or for the treatment of a specific psychological problem. However, some of the possible implications of using neuroscience to answer these psychological and treatment-related questions (and to devising psychotherapy interventions from brain research) have gone largely unexamined. By identifying many of the recurring rhetorical strategies or devices in a brain-based psychotherapy book, I intended for my hermeneutic study to build on the work of scholars (e.g., Bennett & Hacker, 2003; Brothers, 2001; Tallis, 2004) who have critiqued the logic underlying cognitive neuroscience's integration of psychology and neuroscience, and voiced concerns about the societal implications of viewing human psychology in neurobiological terms. I am particularly interested in how the understandings about self that have been associated with mind-brain research might come to be replicated in psychotherapy, and the implications of that possible trend for the profession of psychology. I believe that psychotherapists, patients, and general audiences could benefit from greater awareness of the possible implications of literature that uses mind-brain research to justify established psychotherapy therapies (or possibly to create new therapy discourses based on interpretations of brain functioning or discussions about the brain).

Summary

In this chapter I introduced the modern era concept of the self, some of the historical and cultural trends from which neuroscience research emerged during the 20th century, and critical perspectives on the neuroscientific study of psychology or mental experience. I identified the problem of a relative absence of literature critically examining the integration between psychotherapy and neuroscience, and I described the study of Cozolino's (2010) book that I conduct in Chapters IV and V. In the next chapter I review the justifications and uses of neuroscience in psychotherapy research, and ways in which neuroscience has been applied to psychotherapy theory.

Chapter II: Literature Review

In Chapter I, I discussed the configuration of the self in Western culture beginning around the 17th century with what is considered to be the start of the modern era. I showed that although humans have recognized for thousands of years that brain and conscious experience are somehow related, contemporary neuroscience has created a unique and powerful place in the understanding of the self. In this chapter I broadly survey the literature pertaining to the uses of neuroscience in psychotherapy research and the integration of neuroscience with psychotherapy theories.

Neuroscientific Explanations for Psychotherapy Efficacy

In this section I briefly describe several neuroimaging technologies and I review some of the proposed neurobiological explanations for psychotherapy's effectiveness in reducing psychological symptoms or improving psychological functioning.

A brief overview of common neuroimaging technologies. A brief overview of neuroimaging technologies is necessary to understand the foundation of the research methods and conclusions that authors have drawn from psychotherapy-neuroimaging studies. Lee, Kannan, and Hillis (2006) categorized brain imaging technologies according to whether the technologies have been used to identify abnormalities in brain structure (such as computerized tomography or CT and magnetic resonance imaging or MRI), or changes in brain function (such as positron emission tomography or PET and single photon emission computerized tomography or SPECT), or both structural and functional issues (functional magnetic resonance imaging or fMRI). Kolb and Wishaw (2009) categorized neuroimaging technologies based on whether the technology has been used to detect and record the electrical activity of neurons (such as electroencephalogram or

EEG), or whether the technology uses x-rays to display densities of brain regions and anatomy (such as computerized tomography or CT), or as dynamic imaging methods (PET, MRI, and fMRI). The dynamic imaging methods, all spawned from the principles of CT, utilize computers during scanning sessions which sequentially capture a number of images of an individual's brain, then combine the multitude of images in order to display areas of brain activation (Kolb & Whishaw, 2009).

Single photon emission computerized tomography (SPECT) and positron emission tomography (PET) technologies both display regional cerebral blood flow (rCBF) in an individual's brain, which is strongly suggestive of glucose metabolism or energy use and therefore is used to indicate increases in activity in various regions of the brain. Each of these technologies tracks the activity of a radioactive tracer that is typically injected into participants' bloodstreams prior to brain scanning (Linden, 2008; Peres & Nasello, 2008). FDG-PET, for example, is named for F 18 fluorodeoxyglucose, the radioactive isotope injected into participants or patients prior to scanning that emits positrons as it decays. A computer detects the decay of the tracer as a measure of metabolic activity in human tissue (Peres & Nasello, 2008).

Magnetic resonance imaging (MRI) technology captures images of an individual's brain that display the responses of brain tissues when tissues are exposed to a powerful magnet. Functional magnetic resonance imaging (fMRI) is used in neuroimaging to display images of an individual's brain that can discern between different responses of oxygenated and deoxygenated blood when exposed to the fMRI's magnet. In fMRI, increases in the neural activity in specific areas of an individual's brain are indicated through detecting increases in flow of oxygenated blood flow to those areas

(Beutel, Stern, & Silbersweig, 2003; Lee et al., 2006). fMRI technologies display both anatomical structures and blood-flow processes (Peres & Nasello, 2008). In the next section I discuss how these technologies have been used to explain material correlates of psychotherapy treatments.

Neuroplasticity, learning, and memory. Stress or trauma during early development is believed to impact neurobiological functioning in ways that result in psychological symptoms (Fonagy, 2004; Watts-English, Fortson, Gibler, Hooper, & De Bellis, 2006). Therefore, certain experiences such as psychotherapy are believed to produce changes in individuals' brains that correspond to a reduction of symptoms of psychopathology (Dumont, 2009; Peres & Nasello, 2008). Central to this argument is the broader concept of neuroplasticity, that is, the ability of the brain's structures and functioning to be amenable to changes in response to certain environmental or experiential factors (Brenner, Roder, & Tschacher, 2006; Fuchs, 2004; Grawe, 2007; Liggan & Kay, 1999; Peres & Nasello, 2008). According to Fuchs (2004),

There is a life-long re-mapping of cortical networks according to the individual experience, including the de novo generation of neurons in the adult hippocampus, as proven recently. Neuroplasticity is a prerequisite for any enduring change in behavior, cognition, and emotion. . . . In order to produce lasting effects, psychotherapy should arrive at restructuring neural networks, particularly in the subcortical-limbic system which is responsible for unconscious emotional motivations and dispositions. (p. 479)

Etkin, Pittenger, Polan, and Kandel (2005) emphatically remarked, "there is no longer any doubt that psychotherapy can result in detectable changes in the brain" (p. 155). According to Dumont (2009), "successful psychotherapy entails neuronal restructuring, which in turn enables more functional behavior" (p. 33). Liggan and Kay (1999) outlined several specific physiological mechanisms which have been proposed as

explanations for psychotherapy's ability to effect changes in patients' brains and subsequently behavior. These include altering metabolism in brain regions (and altering serotonin metabolism specifically), impacting thyroid functioning, and creating new synapses (electrical signals between neurons) similar to those that are expected to emerge during new learning experiences.

Brenner et al. (2006) argued that an individual's brain develops largely in accordance with a genetic foundation, yet they noted that

Learning processes control the construction of cognitive-emotional schemata, which is correlated in particular to dendritic cross-linking. . . . If psychotherapy is understood to be a form of learning, then the unfolding learning process can also effect changes in gene expression and thus influence the strength of synaptic connections. (p. S11)

That learning processes are suspected to occur during certain experiences is one of the primary explanations for psychotherapy enabling changes in patients' brain functioning (Centonze, Siracusano, Calabresi, & Bernardi, 2005; Etkin et al., 2005).

Centonze et al. (2005) explained that psychotherapy alleviates psychological distress because processes such as the inhibition of memory consolidation and reconsolidation disrupt patients' emotional reactivity to distressing memories (see also De Raedt, 2006). Researchers suspect that neuroplasticity underlies lasting psychological and emotional reactivity in response to early experiences (forming the basis of implicit or emotional memory, the effects of which are often out of patients' awareness), or allowing for lasting psychological or behavioral change, as new memory alters patients' expectations and perceptions of themselves and others (see Fuchs, 2004; Ligan & Kay, 1999).

According to Centonze et al. (2005), “an effective psychotherapy must be directed to erase maladaptive implicit memories and aberrant synaptic plasticity” (p. 124). Liggan and Kay (1999) noted, “once learned implicitly, rules may exert a self-perpetuating bias for interpreting later experience in a manner consistent with past experience, regardless of the appropriateness of such an interpretation” (p. 105). Liggan and Kay further explained that

In psychotherapy, these patterns of implicit rules are revealed and reflected upon, and change occurs through the learning of new patterns explicitly repeated until the new habit-based manner is engrained in the implicit memory system. Within this proposition, psychotherapeutic change may be attributed to a process of insight or to the provision of abstract explanations regarding underlying relationship patterns. (p. 105)

Some theorists have posited that psychotherapy causes neurobiological changes because the therapeutic relationship itself acts as a reparative attachment relationship that decreases the psychological impact of implicit memories formed during early childhood social interactions (see Duquette, 2010; Fuchs, 2004; Liggan & Kay, 1999). At the end of this chapter I discuss the use of attachment theory in brain-based psychotherapies such as interpersonal neurobiology.

Neuroimaging Methods in Psychotherapy Outcome Studies

In this section I review and discuss the use of neuroscientific research in studies of psychotherapy treatments. According to Linden and Fallgatter (2009),

Treatment monitoring with functional neuroimaging has had particularly fascinating applications in the field of psychological interventions. We can now safely say that there has been a paradigm shift over the past 10 years to an integrated view of psychological and neurobiological models of mental illness and its treatment. (p. 5)

Beutel et al. (2003) argued that, “neuroimaging procedures are based on the fact that mental activity is accompanied by a change of neural activity associated with a change (increase or decrease) of metabolic activity in these areas” (p. 777). Many studies have investigated the neurobiological correlates and impairments of various mental disorders through neuroimaging of research participants who have been diagnosed with specific disorders (see Melcher, Falkai, & Gruber, 2008). For example, researchers have used neuroimaging to display underlying neurobiological processes that are suspected to be involved in a variety of mental disorders including schizophrenia (Carter, Mintun, Nichols, & Cohen, 1997) and bipolar disorder (Blumberg et al., 2003).

In Baxter et al.’s (1992) study, researchers used positron emission tomography (PET) to compare possible neurobiological changes in members of a healthy control group to neurobiological changes in patients who had been treated for obsessive compulsive disorder with either antidepressant medication or a course of behavioral therapy. Since that study, neuroimaging technologies have been used to measure changes in the brain activity of psychotherapy patients following participation in various psychotherapy treatments for various psychological disorders. A sufficient number of these psychotherapy-neuroimaging studies have been conducted such that recent review articles have organized and compared these studies’ methods, results, and psychotherapy treatment implications (Frewen, Dozois, & Lanius, 2008; Peres & Nasello, 2008; Porto et al., 2009; Roffman, Marci, Glick, Dougherty, & Rauch, 2005). Peres and Nasello (2008) examined 21 of these studies and concluded, “the results in general show that the psychotherapeutic approaches used had the potential to modify dysfunctional neural

circuits associated with the disorder in question” (p. 950). Peres and Nasello further noted that

Psychotherapy influenced neuropsychological normalization with a corresponding development of the patient’s psychological equilibrium. In fact, changes occurring at the mental level through psychotherapy are accompanied by changes in brain blood flow and normalization of patients’ neural dynamics. (p. 950)

A review of studies in which research participants attended a structured psychotherapy modality for treatment of a specific psychological disorder, followed by neuroimaging procedures to measure possible neurobiological changes attributable to the psychotherapy, indicate that these psychotherapy-neuroimaging studies can be broadly categorized in several ways. For example, the most frequent disorders for which participants in these studies have been treated with psychotherapy and then administered brain scans have been post-traumatic stress disorder (Farrow et al., 2005; Peres et al., 2007), obsessive-compulsive disorder (Baxter et al., 1992; Brody et al., 1998; Nakao et al., 2005; Nakatani et al., 2003; Schwartz, Stoessel, Baxter, Martin, & Phelps, 1996), panic disorder (Prasko et al., 2004; Sakai et al., 2006) major depressive disorder (Brody et al., 2001; Goldapple et al., 2004; Martin, Martin, Rai, Richardson, & Royall, 2001) and social or specific phobias (Furmark et al., 2002; Johanson, Risberg, Tucker, & Gustafson, 2006; Paquette et al., 2003). The psychotherapy modalities provided to treatment-group participants in these studies have generally been short-term courses (typically comprised of 2 to 24 sessions) of cognitive behavioral therapy (CBT), interpersonal therapy (IPT), behavioral therapy (BT), or exposure therapy. The most commonly used neuroimaging technologies in these psychotherapy-neuroimaging studies have been positron emission tomography (PET), single photon emission computed tomography (SPECT), magnetic

resonance imaging (MRI), and functional magnetic resonance imaging (fMRI).

Participants during neuroimaging have undergone brain scanning while in a resting state, or during symptom provocation, or during some neuropsychological test such as a measure of attention, in order to examine possible neurobiological correlates of the effects of the psychotherapy on psychological symptoms.

These studies have also varied based on the specific research design used in each study. That is, in order to determine the effects of psychotherapy participation on an individual's brain activity, studies have compared psychotherapy participants' neuroimaging results to neuroimaging results of participants in control groups comprised of individuals who had not been diagnosed with the psychological condition under investigation (see Nakatani et al., 2003; Paquette et al., 2003), or individuals who had been diagnosed with the same psychological condition as the treatment group members but who did not receive psychotherapy (see Furmark et al., 2002), or individuals who had been diagnosed with the same clinical condition but received treatment with psychiatric medications in place of psychotherapy (see Brody et al., 1998; Martin et al., 2001).

Examples of neuroimaging in psychotherapy outcome studies. I discuss the following examples of psychotherapy studies in order to illustrate the use of neuroimaging technologies within varying research designs that were used to investigate neurobiological changes in participants who had each undergone specific psychotherapy treatments for treatment of psychological conditions shared by members of their treatment group.

Functional magnetic resonance imaging (fMRI) and cognitive behavioral therapy (CBT). Paquette et al. (2003) investigated neurobiological changes in

participants' brains using functional magnetic resonance imaging (fMRI) following cognitive behavioral therapy (CBT) for treatment of spider phobia. In this study design, 12 female participants were screened for inclusion based on two self-report symptom questionnaires, a review of DSM-IV criteria for specific phobia, and observations of the participants' reactions to viewing images of spiders while placed in an inactive MRI scanner in order to determine whether reactions to this situation were sufficiently tolerable to allow participation in similar procedures during the actual experimental conditions. For treatment comparison, a control group was comprised of 13 female participants who demonstrated no phobic responses to images of spiders and who presented with no histories of psychiatric or neurological illnesses. The participants in both groups underwent fMRI scanning prior to the psychological intervention that was administered to participants in the treatment group. Treatment group participants who received the CBT intervention were re-administered fMRI scanning following treatment in order to assess for neurological changes following therapy, while the control group members did not participate in any further fMRI procedure and received no psychological intervention.

The course of psychotherapy for treatment group members consisted of weekly three-hour group cognitive behavioral therapy sessions, with 6 members in each therapy group, for four weeks. The therapy sessions consisted of gradual exposure therapy (from viewing pictures, to viewing films, to viewing real spiders, to touching spiders) with accompanying exposure-based homework that was completed by participants between sessions. In this experiment, participants were determined to be responsive to therapy after demonstrating the ability to touch the pictures of spiders, the video screen

displaying films of spiders, and then the actual living spiders. Participants also rated their subjective fear responses after viewing the film sequences.

While undergoing the fMRI scan following the course of therapy, participants were shown video images of spiders alternating with images of butterflies for a statistical comparison of patients' brain activity during each of these conditions. The fMRI results that had been captured during both exposure to the butterfly images and exposure to the spider images were compared within treatment-group members and between treatment- and control-group members in order to measure possible neurobiological changes in treatment-group participants accompanying symptom reductions following cognitive behavioral therapy. fMRI images of participants' brains were acquired and then analyzed using "Statistical Parametric Mapping software" (Paquette et al., 2003, p. 403). Each voxel or pixel of the brain images from participants in the treatment-group (before and after psychotherapy) and control group-members was compared in its activity using a computer program that measured the amount of blood oxygenation response in various regions of the brain. A *t*-test was then used to compare the average level of activity at each voxel within and between groups.

Paquette et al. (2003) reported that the comparison between brain images of control subjects and pre-treatment phobic subjects demonstrated that "the dorsolateral prefrontal and the parahippocampal gyrus were significantly activated in phobic subjects, before CBT, but not in the control group" (p. 406). A comparison of brain images of treatment subjects demonstrated, prior to the CBT treatment, "significant loci of activation in the right inferior frontal gyrus and the parahippocampal gyrus, bilaterally" (p. 406), and increases in blood oxygen "were also noted in the left inferior occipital

gyrus, left fusiform gyrus, and right middle occipital gyrus” (p. 406). After undergoing CBT, neuroimaging results of treatment-group members reportedly showed activation that had not been observed prior to the intervention, “bilaterally, in the middle occipital gyrus and the superior parietal lobule. Significant peaks of activation were also seen in the left inferior occipital gyrus, left fusiform gyrus, and right inferior frontal gyrus” (p. 406). Paquette et al. noted among their conclusions, “the brain activation pattern found in phobic subjects, after effective CBT, displayed some similarity with that noted in normal control subjects; that is, in controls, no frontal or hippocampal activity was detected during the viewing of the spider film excerpts” (p. 407). They also claimed that, in support of the efficacy of CBT that had been suggested by earlier findings, “the absence of activation in the dorsolateral prefrontal cortex and parahippocampal gyrus . . . provides strong support to the view that CBT reduces phobic avoidance by deconditioning contextual fear learned at the level of the hippocampal/parahippocampal region” and also “by decreasing cognitive misattributions and catastrophic thinking at the level of the prefrontal cortex” (p. 407). That statement explained psychotherapeutic efficacy through a neurobiological mechanism of change.

The methods and conclusions of this study warrant further discussion. In Chapter I, I discussed the concerns of scholars (e.g., Uttal, 2007) who have questioned whether it is logical to reify or attempt to materialize psychological concepts by associating those concepts with related brain regions and neural activity. Faux (2002) outlined several conceptual and methodological critiques of experiments that use neuroimaging to study cognitive psychology constructs. The specific methodological issues that Faux raised about validity and reliability of mind-brain research is applicable to Paquette et al.’s

(2003) use of neuroimaging to study neural correlates of cognitive behavioral therapy that was shown to have been effective for decreasing symptoms of specific phobia.

Paquette et al. (2003) used what Faux (2002) identified as a common experimental design in cognitive neuroscience, which consists of subtracting the brain activity recorded during one cognitive task from the brain activity recorded during another cognitive task in order to identify whether changes in brain activity occurred and if so, the brain regions that were involved. In the Paquette et al. study, this process entailed measuring neural activity during a treatment task (e.g., viewing spiders), and measuring neural activity during a baseline task (e.g., viewing butterflies), and then computing an average brain scan for each participant under each condition. Researchers subtract average baseline scans from average treatment scans to determine whether the averages across all individuals in all scans suggest the presence of any “brain regions with averages that are statistically different from zero” (Faux, 2002, p. 166). In cognitive neuroscience studies that use the subtraction method, the brain regions with statistical significance are thought to explain the cognitive process being investigated.

According to Faux, there are several problems that may arise with conclusions drawn from this method. In these studies, baseline and treatment tasks are said to differ based on a cognitive process, yet Faux argued that it is unlikely that a single task or concept could be devised that elicits a single brain operation, as many brain processes are required even for simple cognitive tasks. Legrenzi and Umiltà (2011), who also critiqued the subtraction method, noted that if the baseline task is for any reason wrongly selected, the conclusions about the experiment are meaningless.

Faux (2002) also argued that, whereas brain activity can be directly observed, cognitive concepts (e.g., attention) are broad and imprecise, and therefore at times there is not general agreement on their exact meanings. In the Paquette et al. (2003) study, this issue may arise with the researchers' use of concepts such as "volitionally" (p. 404) and "vigilance" (p. 407) to describe participants' mental states. "If relevant variables are not under proper experimental control, then the results are likely to be uninformative or misleading" (Faux, 2002, p. 167). With varying interpretations of important constructs, an experiment's validity (that is, the accuracy with which an experiment identifies and measures a concept under investigation) may be questionable. Poorly quantified concepts also limit the reliability of an experiment (that is, the ability to replicate its findings).

Paquette et al. (2003) used a *t*-test to compare averages of brain region activation within treatment-group participants before and after CBT, and between phobic subjects and subjects in the normal control group. *t*-tests were conducted on each voxel. Faux (2002) cautioned against the use of univariate statistics to compare the activity of thousands of voxels. Faux wrote, "not only does Type I error inflate due to multiple correlated tests, but statistical significance, accurate or not, may have little relation to neurological significance" (p. 171). In other words, there is an increased chance of incorrectly concluding that there is a statistically significant difference between two samples of voxels or pixels representing brain activity. In the Paquette et al. study, Type I error may have arisen from analyzing the multitude of brain images produced from only 12 participants in the treatment group and 13 participants in the control group. Further, all participants in both groups were female, which also suggests limited generalizability of this study for wider populations. In sum, the concerns that Faux raised about the use of

neuroimaging to study cognitive concepts are relevant in light of the neuroimaging methodology and conclusions of Paquette et al.'s study of neuroimaging and psychotherapy.

Single photon emission computerized tomography (SPECT) and exposure therapy. Peres et al. (2007) recruited 37 participants who had been diagnosed with subthreshold posttraumatic stress disorder, of which 16 were administered a manual-guided exposure-based therapy for 15 weeks while the remaining 11 participants remained on a waiting list to receive psychotherapy and were therefore used as a comparison group. Participants in both groups each underwent two SPECT scans. The neuroimaging procedure for both groups consisted of having each participant listen to a script read aloud describing their traumatic experience, then voluntarily recalling the memory in order to re-experience the episode. A radioactive tracer was injected into participants 30 seconds into the reading of the trauma narrative. 50 minutes were provided for rest before participants were taken to receive their SPECT scan.

The psychotherapy treatment group members underwent one scan following retrieval of the traumatic memory prior to beginning psychotherapy, and then received the second scan (also following retrieval of the traumatic memory) after completing 8 weekly sessions of the psychotherapy treatment. Members of the control group received initial SPECT scans prior to treatment group members beginning therapy, and again after 60 days, with the same symptom provocation method (although the control group had not been receiving treatment). Participants in both groups were administered the same two structured diagnostic interview assessments before the first scan and after the second scan. Three self-report symptom measures (one each pertaining to depression, anxiety,

and posttraumatic stress disorder symptoms) were administered after each scan. Further, an inventory measuring the intensity of traumatic memories was administered prior to treatment and after treatment as a pre- and post-treatment measure (control group members were administered this instrument twice in 60 days).

Peres et al. (2007) found decreases on nearly all psychological symptom measures for treatment group participants, and no change on nearly all measures for control group participants. The authors correlated these psychological findings with changes in brain activity that SPECT scan results indicated. They selected seven brain regions for their statistical analysis, as prior research suggested that those regions are active during traumatic memory retrieval. Among the findings, participants showed decreased activity in the left amygdala, and increased activation of the left anterior cingulate, left prefrontal cortex, left and right thalamus, left parietal lobe, left hippocampus and left Broca's area.

Peres et al. (2007) discussed a variety of observed correlations between the reduction of posttraumatic symptoms and changes in regional brain activity. For example, they noted that "integrating sensorial traces of memories into structured therapeutic narratives is one of the main challenges for psychotherapies applied to trauma victims" (p. 1488). They then concluded,

The circuitry involved in the post-psychotherapy SPECT scans probably indicates better codification and processing of the sensory information, which was not processed in the baseline scans. The relative decrease in activation of the amygdala during the psychotherapy follow-up scan may also be related to a less intense subjective experience of unpleasant emotions, accompanied by activity in the neural network associated with conscious interpretation, synthesis, and integration of those sensory and emotional stimuli. (p. 1488)

As with Paquette et al.'s (2003) neuroimaging study of cognitive-behavioral therapy for specific phobia that I discussed above, Peres et al.'s (2007) study warrants

further discussion. This study did not use the subtraction method as in the Paquette et al. study in order to identify differences in brain activity before and after a psychotherapy treatment. Instead, Peres et al. recorded participants' brain activity before and during the course of treatment, each time following a task that induced traumatic memories (and the psychological experiences of re-experiencing those memories consistent with posttraumatic stress disorder symptoms). This means that Peres et al. might have guarded against problems that arise in the subtraction method if a baseline task is poorly selected for treatment comparison (see Legrenzi & Umiltà, 2011). In other words, this study may have greater validity because there is less chance that factors other than psychotherapy accounted for the neural differences between treatment and control group members. Further, the treatment and control group members were more diverse in this study (at least with regards to gender) than those in the Paquette et al. study, and therefore the results of this study could offer greater reliability than that study.

It is noteworthy that after Peres et al. (2007) read trauma narratives to participants prior to administering the brain scans, participants were asked to voluntarily re-experience their traumatic events, and it was unclear how the researchers could verify or quantify that participants were complying with those instructions. Because brain activity is measured by averaging neural changes across participants, individual differences in brain activity could still be vast.

As with the study by Paquette et al. (2003), Peres et al.'s (2007) use of univariate statistics to test for statistical significance between psychological symptoms and brain activity suggests a heightened risk of incorrectly concluding that a statistically significant relationship exists between those variables (i.e., Type I error). Peres et al. used several

psychological assessment instruments to determine psychotherapy treatment efficacy, to measure psychological symptoms pre- and post-treatment, and to compare changes in control group members and treatment group members over two months. Although psychological assessment and treatment are well paired, the conceptual problems with mapping psychological concepts onto brain regions that scholars (e.g., Bennett & Hacker, 2003; Faux, 2002) have raised also deserve attention here. In sum, although there are still conceptual and methodological concerns associated with using neuroimaging to study psychotherapy concepts, Peres et al. took steps to increase the validity and reliability of their experiment that seemed to be missing in Paquette et al.'s neuroimaging study discussed above.

Brain-Based Psychotherapy Theories

Whereas neuroimaging technologies have been applied to psychotherapy outcome studies in order to assess changes in the brains of therapy patients that occur with the reduction of psychological symptoms following certain psychotherapy treatments, some authors have proposed new psychotherapy paradigms based on the integration of neuroscience research and psychotherapy theories. Examples of these include coherence therapy (Toomey & Ecker, 2007) and interpersonal neurobiology (Siegel, 1999). A brain-based interpretation of psychoanalysis called neuropsychoanalysis (Schore, 2012) integrates neuroscientific research with psychoanalytic concepts and theories.

Coherence therapy. Toomey and Ecker's (2007) coherence therapy is a psychotherapy modality derived from a neurobiology-informed relationship between memory and psychological distress. The goal of the therapy is to reduce the strength (depotentiation) of certain neurons thought to be responsible for the implicit (emotional)

memories associated with distressing psychological symptoms (Ecker & Toomey, 2008; Toomey & Ecker, 2007, 2009). Toomey and Ecker (2007) described their goal of devising a psychotherapy modality that would unite reductionist sciences with the experiential process of psychotherapy, and would also surpass the shared rate of effectiveness among various psychotherapy modalities. They proposed that coherence therapy interventions achieve those goals by maximizing the plasticity of patients' brains, indicated by targeting brain regions in which symptoms originate, doing so as quickly as possible, and targeting the most powerful types neural connections (Ecker & Toomey, 2008).

Toomey and Ecker (2007) based the coherence therapy model on the premise that neurobiological explanations for effective psychotherapy practices are best understood through constructivist theory. As a constructivist psychotherapy, they favored a philosophy of human psychology in which each individual is assumed to create and exist in his or her world in a way that is consistent with certain personal constructs or individual interpretations rather than a single true or objective reality. They further noted that each individual is believed to actively assemble knowledge rather than passively receiving it, and then adapting to the world through personal experiences rather than through any single true human nature. Within this theory, personal constructs or knowings enable individuals to experience and adapt to the world, are created through a variety of perceptual and physical processes, are synonymous with memory (some are implicit or unconscious and others are explicit or conscious), and are able to be revised. According to Toomey and Ecker (2007), "psychological constructivism's central insistence on the active role of the individual in shaping experiential reality receives

extensive corroboration from findings on how the brain functions” (p. 205). They cited Quartz & Sejnowsky (1997) as having identified this phenomenon as neural constructivism, and portrayed a fit between this phenomenon and the tenets of constructivist theory as applied to psychotherapies positing a highly subjectivist view of reality.

According to Toomey and Ecker (2007, 2009), most psychotherapy patients’ symptoms are caused by implicit memories, which are emotional reactions that are triggered in situations that are in some way reminiscent of earlier formative experiences. As certain psychotherapy interventions encourage a patient to change his or her constructs or personal beliefs, these interventions enable a reduction in psychological symptoms through a corresponding reduction in emotional reactivity. In coherence therapy, psychotherapy techniques that reduce psychological symptoms consist of identifying the early experiences that first produced certain constructs or views of reality that continue to maintain unwanted emotional reactivity. The authors stated that the purpose of all psychotherapies informed by neuroscience research appears to be the integration between areas of the brain that are involved in this longstanding out-of-awareness reactivity, and areas of the brain that allow a person’s current attention to identify and focus on the underlying beliefs that maintain those longstanding reactions (Ecker & Toomey, 2008).

Interpersonal neurobiology. Some authors who have advocated for the creation of a theoretically integrative psychotherapy in which interventions target neurobiological change have also cited brain-based explanations for the healing effects of the therapeutic relationship, that is, the purported ability of the human brain to respond positively to the

empathic qualities of some interpersonal relationships. For example, authors Linford and Arden (2009) argued that, “beyond the surface differences of various therapeutic methods, at heart we help clients change by enhancing the neuroplasticity of their brains” (p. 22). Those authors further noted,

Our brains are exquisitely adapted to change in response to the attuned and compassionate interest of another human being. Attunement helps our clients face what has been hidden and experience what has been denied, and as that happens both their brains and ours are changed. We also help by educating clients about how their behavior affects their brains and how that in turn changes how they feel. (p. 22)

One paradigm that explores the interplay between the quality of human relationships and the effects on individuals’ brains (with a particular but not exclusive interest in parent-child relationships) is titled interpersonal neurobiology. Psychiatrist and author Daniel Siegel (1999) presented the phrase interpersonal neurobiology in his book *The Developing Mind: How Relationships and the Brain Interact to Shape Who We Are*. In that book Siegel provided a theoretically integrative model of human social development for the stated purpose of building “a foundation for a neurobiology of interpersonal experience” (Siegel, 1999, p. 1). According to Siegel (2001), “the brain is structured with an innate capacity to transcend the boundaries of the skin of its own body in integrating itself with the world, especially the world of other brains” (p. 87). Authors have described interpersonal neurobiology as a general paradigm of human psychological, neurobiological, and social development, the tenets of which represent convergent views and findings from various disciplines across sciences and humanities (Badenoch, 2008; Codrington, 2010; Siegel, 2001). Siegel was the founding series editor in Norton Books’ Series on Interpersonal Neurobiology, which displays over 30 books

for sale on its Internet webpage, and one large physical model of the human brain with moveable parts, which the website has marketed to mental health clinicians as “an ideal tool for helping your clients to visualize the complexities of the brain and mental health disorders—and a useful refresher for practitioners who find brain anatomy overwhelming” (W.W. Norton & Company, Inc., 2013, para. 2). The topics of the books in Norton’s interpersonal neurobiology series are varied and include general psychotherapy texts for practitioners (Badenoch, 2008; Cozolino, 2010), and psychotherapy texts specifically purposed for the treatment of trauma (Wilkinson, 2010), infant mental health and child-parent interventions (Lillas & Turnbull, 2009), and neuroscience-informed approaches to social work (Applegate & Shapiro, 2005).

In general, the interpersonal neurobiology paradigm is based on neuroscience research suggesting that the structures of individuals’ brains are “constantly being formed and re-formed through interactions with other brains” (Hollingsworth, 2008, p. 841). Specifically, interpersonal neurobiology draws heavily from developmental neuroscience as described by authors such as Allan Schore (1994), who has proposed that an individual’s capacity for emotional regulation and a stable sense of self has its origins in early attachment relationships, which are internalized and stored in the right hemisphere of an infant’s brain. These attachment experiences therefore impact brain development, influence the quality of later personal relationships, and confer either protection against, or increase individual risk for developing symptoms of psychopathology (Schore, 2001, 2002, 2005). According to Schore (2005), early attachment experiences occur during preverbal stages of development and form the basis of implicit memories that arise as nonverbal or emotional reactions to later social experiences. According to interpersonal

neurobiology as a psychotherapy paradigm, the relationship in psychotherapy between therapist and client is potentially analogous, in terms of its neurobiological effects, to healthy attachments during childhood. Therefore, influenced by the ideas of Schore (2005), interpersonal neurobiology interventions attempt to effect psychological change in patients in part through influencing right-brain (and other neurobiological) activity of therapy patients through an empathic and supportive therapy relationship (Siegel, 1999).

Neuropsychanalysis. Schore (2012) founded neuropsychanalysis or the disciplinary integration dedicated to combining psychoanalytic concepts and theories with an understanding of their neural correlates. Neborsky (2006) advocated for a short-term psychodynamic therapy approach that he based on Schore's (1996) interpretation of right-brain processes as the seat of unconscious relational processes. In attributing psychopathology to inadequate attachment experiences that prevent right-brain development of typical emotional regulation, Neborsky (2006) wrote, "some of us now think of infants from birth to about 16 months as right brain creatures" (p. 524). He argued that an adult psychotherapy patient's defensiveness could represent unresolved separation anxiety caused by the inability of an early caregiver to help the patient internalize a sense of emotional regulation. He also posited that traditional long-term psychodynamic psychotherapy, with a dialogue centered on therapists' interpretations or explanations of patients' behaviors, has often neglected the patients' emotional or nonverbal experiences and therefore failed to correct patients' attachment-oriented, right-hemisphere neurobiological processes. Neborsky (2006) explained that during psychotherapy, after a patient's superego (that is, anxiety-producing fears of abandoning his or her defensiveness) is sufficiently lowered, "the therapist can become a new

attachment figure and rapidly improve attachment status” (p. 527). Neuropsychanalysis contends that therapy is a process of communication between the right hemisphere of a therapist’s brain and the right hemisphere of a patient’s brain. These statements illustrate a relocating of psychological concepts to the individual brain.

In sum, within psychotherapy literature, rationales for neuroscience-psychotherapy integration include identifying the efficacy of psychotherapy approaches, integrating psychotherapy theories based on those findings, and in general providing a putatively more coherent and scientific explanation of the purpose and process of psychotherapy. A review of psychotherapy literature involving the integration of neuroscience and psychotherapy suggests that neuroscience research methods have been used to study the neurobiological effects on patients undergoing primarily short-term, evidence-based psychological treatments for specific psychological disorders, and neuroscience has also been used to combine aspects from various psychotherapy theories into integrative paradigms such as interpersonal neurobiology.

I provided this review of literature to highlight ways in which psychotherapy research has included neuroimaging, as well as ways in which psychotherapy theories have incorporated cognitive neuroscience into psychological and psychotherapy theories. Cozolino’s (2010) neuroscience-informed psychotherapy text, which I examine and critique in Chapters IV and V, emerged amidst these applications of neuroscience to psychotherapy. This chapter was therefore intended to provide a more immediate historical and professional context for the emergence of his book than the longstanding Western philosophical and social issues I presented in Chapter I.

Summary

In this chapter I provided a sample of psychotherapy literature integrating neuroscience and psychotherapy. In the next chapter I outline the methodology of my research project. I discuss the textual analysis I used to interpret the content, rhetoric, and themes in Cozolino's (2010) book.

Chapter III: Methods

In this chapter I discuss the research approach and theoretical framework of this hermeneutic study of Cozolino's (2010) brain-based psychotherapy text *The Neuroscience of Psychotherapy: Healing the Social Brain*.

Research Approach

In Chapter I, I reviewed several recent cultural histories of brain research during the late-19th and early-20th century in Western Europe and the United States that showed how discourses about the brain and brain research reflected political, social, and economic trends and changes of their time and place. Those critical historical accounts illustrated how the origins of those historical and cultural phenomena became assigned to the structures of the individual material brain. Those histories included accounts of how early brain scanning technologies such as the EEG sparked widespread excitement about translating mental experiences that had been considered private, and contained within each individual, into observable depictions of individual psyches or personalities. In other words, the use of technology to transcend the material-nonmaterial or inner-outer divide suggested an interest in resolving mind-body dualism or revealing in public and material form the interiorized private individual self. I recognized that a textual analysis was particularly relevant for interpreting the understandings of self that might be perpetuated by a brain-based therapy discourse, in part because scholars have examined the way language is used in cognitive neuroscience literature to portray psychological concepts as easily studied by neuroscience when in fact there are philosophical and scientific controversies with that position. Scholars have also commented on the societal effects of a vision of the self as reducible to the brain. Philosophical hermeneutics is relevant for

interpreting the ways in which a brain-based psychotherapy text and its subsequent therapy discourses emerge from this sociocultural situation and use language in a way that then replicates contemporary social practices and understandings of self.

Theoretical Framework

Philosophical hermeneutics and the self in psychotherapy. In this section I discuss the tenets of philosophical hermeneutics as a sociocultural paradigm that emerged during the Interpretive Turn in the humanities during the mid-20th century, and the use of hermeneutics to understand psychotherapy practices as reflections of the historical and cultural situations in which they emerged. By understanding psychological concepts as contextual phenomena—that is, the understanding that experience is situated between people rather than within each individual, and emerges uniquely from a convergence of cultural and historical trends—theories such as hermeneutics provide alternatives to empirical, scientific research methods in psychology and psychotherapy. Hermeneutics challenges the understanding that individuals exist a priori over the context into which they are born. This rejects the assumption of an inner-outer or a mental-material dichotomy born of modern era philosophy and scientism. It also stands contrary to the claim that scientific discoveries necessarily represent inevitable, ahistorical truths about the world, thereby rejecting the primacy of empirical research methods in psychology and psychotherapy. Especially applied to critical analyses of psychotherapy theories, hermeneutics has been influential for the understanding that these theories embody and therefore replicate certain understandings of the good and therefore make claims about morality or a vision of the best way of life that emerges uniquely within a historical era.

The term hermeneutic has longstanding meaning in Western civilization involving the concept of interpretation, notably the interpretation of texts. Kirschner and Martin (2010) placed philosophical hermeneutics as one among several primary sociocultural theories that have been influential to late-20th century psychotherapy theories that have challenged empirical or statistical research as the preeminent research paradigm for understanding human psychology. They noted that philosophical hermeneutics shares with other prominent sociocultural perspectives (such as discursive, constructionist, and dialogical theory) an interest in how “self and mind can be studied in terms of how an individual’s sense of identity, and related phenomena such as memory and emotion, are patterned in terms of cultural narratives, symbols, and practices” (p. 9). In these approaches, self is constituted by multiple discourses and relationships, human agency is valued over determinism, and the Cartesian split between mental and physical experience is refuted without appealing to any one emphasis on physiology, emotions, or personality traits to explain human psychology. Rather, “the primary object of psychological study is the person acting within the biophysical and sociocultural world” (Kirschner & Martin, 2010, p. 11).

Although hermeneutics challenges the core assumptions of modern era philosophy and most mainstream psychological theories and research, Kirschner and Martin (2010) noted that some elements of this contextual and relational thinking were present in the early founding of the discipline of psychology, and were present in some form throughout Enlightenment, Romantic, and even modern era thought. According to Frie (2011), despite the late-20th century turn toward critical social theories of selfhood in psychotherapy that challenge the inherent valuing of embodied individualism typical in

20th century psychotherapy discourse, those individualist Western values remain embedded in much of psychotherapy practice. In other words, hermeneutic and other interpretive theories respect the fluidity between historical eras and how traditions emerge uniquely in a certain time and place yet are also continuous between successive eras.

According to Woolfolk, Sass, and Messer (1988), hermeneutics has provided an alternative to empirical research (that is, sensory or observation-based research) that has typically been most valued in professional psychology (see also F. C. Richardson, 2009). Spence (1988) argued that, rather than opposing the interests of physical or empirical scientific methodology, hermeneutics as an interpretive research approach is interested in meaning, and is critical of the assumption among empirical sciences that individual behaviors can be understood apart from the context within which those behaviors occur. Some scholars have argued that although hermeneutic research has served as a primary alternative to the empirical research that is most prominent in psychology, interpretive and critical research can also inform and improve empirical research, and interpretive and critical theorists and researchers often share with empirical scientists a mission to find meaning (Meichenbaum, 1988; Spence, 1988). For example, these authors argue that hermeneutics improves upon empirical research by encouraging researchers to consider that interpretations have an impact on scientific inquiry, and therefore it is misguided to believe that scientific efforts represent objective or neutral inquiry that is removed from persons conducting the research. Further, hermeneutics challenges empiricist researchers to consider how context impacts behavior (thereby challenging the assumed of validity of behavioral research conducted in laboratory settings separate from daily life).

Hermeneutics encourages empirical investigators to recognize not only that people and their contexts are dynamic and change over time, but also that psychological or behavioral constructs being measured change over time (Meichenbaum, 1988).

Philosophical hermeneutics as an interpretive research paradigm in contemporary psychotherapy (Bernstein, 1988; Cushman, 1995; Meichenbaum, 1988) is most associated with the writings of the 20th century German philosopher Hans-Georg Gadamer (1966/2004, 1975, 1986/1994a, 1986/1994b). Gadamer (1966/2004), borrowing the term hermeneutical from Martin Heidegger, attributed the reemergence of hermeneutic interpretation in the 20th century to philosopher Wilhelm Dilthey. Critical psychotherapy researchers have noted this as well, and have also noted that philosophical hermeneutics emerged in part as an effort to challenge the interpretive efforts of Dilthey and to focus on how a shared reality emerges through language, as opposed to the modern-era notion of an inner private self that most 20th century psychotherapy practices seem to have encouraged (see Sass, 1988).

Sass (1988) summarized H.-G. Gadamer's position that self is inseparable from the historical and cultural context in which the self exists. Therefore, attempts at self-reflection or understanding subjective experiences necessitate a consideration of those contextual factors. Sass further discussed the hermeneuticists' argument that scientific theories also reflect the historical and cultural contexts in which those theories have emerged and are disseminated. Psychotherapy theories have been described by many interpretive theorists as privileging or valuing certain ways of living and experiencing the world even though the theories at times ignore the underlying values or virtues that they promote (Meichenbaum, 1988; Sass, 1988; Woolfolk et al., 1988). Historically situating

scientific efforts—in this case, psychotherapy theories, research, and practices—allows researchers in the humanities to engage in dialogues about the cultural values and virtues that inspired those theories, research, and practices, and which therefore unknowingly promote certain aspects of the wider cultural context.

H.-G. Gadamer (1966/2004) observed the mid-20th century turn in philosophy toward an emphasis on language or semantics as a way of interpreting how individuals come to embody or live certain social practices rather than merely contemplate or reflect upon these practices. For psychotherapy practices, this interpretive emphasis on language and discourse creates certain implications for the effects that psychotherapy practices might have on therapy patients, as psychotherapy patients come to embody or replicate whatever wider cultural values or beliefs that might be encouraged through therapeutic discourse (Cushman, 1995, 2002; Orange, 2009; F. C. Richardson, 2002; F. C. Richardson & Christopher, 1993; Stigliano, 1989). “By saying that the world is linguistic, hermeneutics is saying that we can understand action by its reference to a larger common discourse, a community’s conversation which pervades and gives context for that action” (Stigliano, 1989, p. 48).

Hermeneuticists have suggested that meaning results from active experiencing rather than passive contemplation (Woolfolk et al., 1988). Philosophical hermeneutics considers that language or discourse, rather than simply describing social practices, actually constitutes the self (Wachterhauser, 1994). In critical psychotherapy research this enables researchers to interpret psychotherapy theories as appealing or acceptable for patients and clinicians because of the ways that therapy theories implicitly contain beliefs, customs, and traditions shared by members of a society within a certain time and

place. This provides psychotherapy researchers with the means by which to reflect critically about the broader configuration of self that is reinforced through the resulting therapy practices (Cushman, 1995; F. C. Richardson & Bishop, 2004).

In the tradition of Heidegger's ontological premise, hermeneuticists argue that individuals experience the world by actively interpreting the world through the lens of culture and social order; language, or speech, allows for understanding that social order. Individuals are therefore assumed to not simply understand the world through language; instead, individuals are thought of as actively living the discourses of their historical era. The goal of hermeneutics is "to reconstruct these ontologies or distinctions embodied in our practices" (Stigliano, 1989, p. 49). Further, hermeneutics "does not attempt to find out necessarily the truth of these interpretations, but only how these interpretations shape and determine the way we live in the world" (p. 49). The hermeneutic circle—the metaphor for this interpretive research—describes a cultural practice or artifact such as a text as simultaneously constructed by, and actively constructing the larger historical framework from which it emerged, in an ongoing and mutually dependent relationship (Cushman, 1995).

Cushman (1995) applied philosophical hermeneutics in his cultural history of psychotherapy in the United States. In the modern era, the idea of human being as a self-contained individual was a cornerstone of philosophical and scientific inquiry. The conceptualization of psychological symptoms and psychological treatment that began during the early-20th century occurred amidst a sudden urbanization and industrialization, yet within the backdrop of racism and violence that had been part of American culture since the nation's inception. Within this context psychoanalysis gained

popularity within that cultural and historical frame as a “local” cure for a “local” self (Cushman, 1995, p. 25). A cultural history of psychotherapy suggests that understanding why Americans were ready to embrace psychoanalysis as a cure for psychological symptoms requires an understanding of the convergence of sweeping economic and social changes amidst shared historical traditions. Cushman discussed how psychotherapy expanded in power and influence as an American institution, aligning itself with the scientific methodology of psychological research. Psychotherapy theories throughout the 20th century can be understood as reflections of wider cultural trends and social practices. Periodic changes in psychological theory are believed to mirror broader shifts in how people live and communicate with each other. Following this tradition, I based my critical historical interpretation of Cozolino’s (2010) *The Neuroscience of Psychotherapy* on philosophical hermeneutics.

Late-20th century changes in selfhood reflected in psychotherapy theories.

During the 20th century an epochal historical shift occurred in Western science and philosophy after three centuries of modernity. In understanding the transition between modernity and what has been broadly termed postmodernism, Huston Smith (2003) wrote,

The modern outlook can be summarized by identifying its three controlling presuppositions. First, that reality may be personal is less certain and less important than that it is ordered. Second, man’s reason is capable of discerning this order as it manifests itself in the laws of nature. Third, the path to human fulfillment consists primarily in discovering these laws, harnessing them where this is possible, and complying with them where it is not. The reason for suspecting that this modern outlook has had its day and is yielding to a third great wave in Western thought is that reflective men are no longer confident of any of these three postulates. . . . Frontier thinkers are no longer sure that reality is ordered and orderly. If it is, they are not sure that man’s mind is capable of grasping its order. Combining these two doubts, we can define the Postmodern

Mind as one which, having lost the conviction that reality is personal, has come to question whether it is ordered in a way that man's reason can lay bare. (pp. 6-7)

Smith (2003) identified significant changes in science, philosophy, theology, and art during the 20th century. He noted that 20th century advances in physics have led some theorists to question whether humans are capable of visualizing or imagining the possible behavior of matter and energy. Philosophy has seen a collapse of objective metaphysics and the emergence of a general uncertainty about whether humans are capable of explaining how reality emerges and becomes ordered. In theology, most Judeo-Christian religions seem to have moved past the integration between belief in God and rationality that dominated the modern era; most Western religions today question in some way whether reason is suited to understand the existence of God, and instead embrace a faith in God rather than delineated reasons for believing in God. Further, religious beliefs now often stem from personal histories or subjective experiences rather than arguments or practices espoused by religious institutions. With art and literature, Smith recalled the prominence during the 20th century of authors questioning concepts of objectivity and morality, and often lacking a shared artistic framework entirely. Protagonists such as those in the seminal existential novels find themselves in a world devoid of meaning and struggling to find purpose—even punished for attempting to do so. In visual arts the questioning of objectivity and meaning shows up, for example, in bold depictions of trivial and common aspects of human life such as commonplace objects, thereby illustrating how the seemingly trivial is as worthy a way of understanding human beings as depictions of religious experiences or historical events.

According to Smith (2003), recent changes within science, philosophy, theology, and art share an “acceptance of reality as unordered in any objective way that man’s mind can discern.” (p. 15). Further, “this acceptance separates the Postmodern Mind from both the Modern Mind, which assumed that reality is objectively ordered, and the Christian Mind, which assumed it to be regulated by an inscrutable but beneficent will” (p. 15). Neimeyer (1993) noted that the influence on psychotherapies of constructivism (the rejection of objective reality or truth in favor of an interpretive framework that views individuals as active creators of meaning and experience) has fit broadly within a postmodern understanding of social and cultural influences on human behavior. Hoyt and Combs (1996) described the impact of the Interpretive Turn in the humanities on late-20th century psychotherapy approaches such as Michael White’s narrative therapy and solution-focused therapy.

Theorists have noted that some psychotherapy theories during the 20th century increasingly turned away from the idea that individuals are comprised of a unitary individual with a deep interiority, and began to embrace sociocultural theories that posit a shift in the configuration of self toward a shallow, relational, decentered person described by the quality of multiplicity or being a multiple self (Cushman, 2002; Cushman & Gilford, 1999; Frie, 2009a, 2009b; Frie & Coburn, 2011; Salgado & Hermans, 2005). The broad cultural shift from a strongly entrenched modern or Cartesian self to a fragmented, multiple self has been significant for late-20th century shifts in psychotherapy theories. As Cushman & Gilford (1999) noted, "multiplicity, in other words, has begun to appear as the embodiment of the good" (p. 18). According to Salgado and Hermans (2005), two broad antecedents can be ascribed to the paradigm shift toward a multiple or non-unitary

self amongst psychotherapy models: The social-cognitive perspective (which views self through the computer metaphor of an information-processing device) and the social constructionist framework (which views self as a construct that is constituted through language).

Frie and Coburn (2011) noted that gestalt psychotherapy theorists were the first major school of therapy to embrace a relational rather than an individualistic conception of selfhood. Late-20th century psychoanalytic theorists have followed in the understanding of self as relational (Bromberg, 1993). Psychoanalytic theorists have noted a return to the seminal work of psychiatrist and author Harry Stack Sullivan who has become highly influential for psychotherapists, particularly interpersonal or relational psychotherapists. In his cultural history of psychotherapy in the United States, Cushman (1995), whose hermeneutic or critical historical framework for interpreting psychotherapy theories is the basis of this textual analysis and historical interpretation of brain-based psychotherapies, described the eschewing and ignoring by psychiatrists and psychologists of Sullivan's highly critical and progressive understanding of self that would have radically altered the history of psychotherapy had it been embraced during its time.

The adopting of late-20th century sociocultural perspectives has led some of the primary psychotherapy theories to view therapy as a fundamentally relational endeavor shared between therapist and patient, rather than an effort at individual improvement through predictable, empirically-based, or pre-determined and replicable therapy interventions. A hermeneutic perspective understands this relational shift as mirroring the historical time and place in which therapists now practice. Relational practices emerge

from a broader cultural embrace of late-20th century shifts toward a self characterized by multiple, flexible, and changing identities. Cushman and Gilford (1999) cautioned against a misuse of those interpretive theories by some psychotherapy approaches that seem to inadvertently reinforce or encourage for patients some of the problematic aspects of the shallow, decentered self. For example, the privileging of a self that is capable of quick lifestyle and personality changes may contribute to fleeting relationships and psychological instability.

Within psychotherapy, authors such as Orange (2003), Hoffman (2009), and Vivona (2009) have come out against efforts to integrate neuroscience and psychotherapy that use neuroscience to explain and validate psychotherapy theories. For example, Hoffman (2009) situated the appeal of neuroscience within the broader movement in psychoanalysis to validate itself as a legitimate science through empirical or positivist research methods. Orange (2003) criticized the reductionism of mind to brain that is involved in neuroscientific interpretations of psychoanalytic theory and practice. She also rejected the frequent claim in psychotherapy literature that integrating neuroscience with psychoanalysis constitutes a return to Freud's early speculation that mind or ego would ultimately be discovered as neural processes. Orange proposed a perspectival realism paradigm as an alternative to the reduction of psychoanalytic theory to cognitive neuroscience models. She also argued that perspectival realism is an alternative to problematic incarnations of postmodern or constructivist theories that implicitly dismiss the importance of agency and subjective experience for therapy patients. In psychotherapy literature there has been a relative absence of critical interpretations of the integration between neuroscience and psychotherapy.

Application of hermeneutics to textual analyses. Above I discussed how philosophical hermeneutics emerged during the 20th century as an alternative to positivism or quantitative research methods in the social sciences. Hermeneutics is applied to interpret the cultural and historical traditions, meanings, beliefs, and values that are implicit in psychological and psychotherapy theories and practices. As an interpretive paradigm critical of modern era scientism, hermeneutics challenges the privilege of rigidly structured, procedural research approaches. Scholars have debated how hermeneutics can be applied to research in psychology without replicating the scientific objectification that hermeneutic theorists historically situate and interpret (Woolfolk et al., 1988).

Stigliano (1989) addressed this issue in his discussion of how hermeneutics can be applied to the cultural and historical interpretation of a certain narrative or discourse such as a text. He argued that although hermeneutic theory challenges the primacy of rigid, technical approaches for collecting and analyzing data, there is a sequence of identifiable “moments” (p. 67) that researchers commonly experience when selecting and interpreting a text that is characteristic of valued practices within a certain time and place. A textual analysis can use a book, an interview or series of interviews with research participants, or other cultural artifacts that are representative of implicit assumptions and meanings that are shared amongst readers and between authors and audiences.

The first moment, titled text generation, entails either composing a new text (such as a series of interviews), or selecting a text that already exists and is exemplary of a certain historically distinct practice. I selected Cozolino’s (2010) book as a popular text that is exemplary of brain-based psychotherapy discourses because of its broad scope and

the variety of therapy theories and practices that it contains. I generated questions about how Cozolino (2010) integrated neuroscience into his understanding of the history, purpose, and best practices of psychotherapy, and specific ways in which he used language to do this throughout his book. I addressed these questions by identifying exemplary passages in which he directly or indirectly discussed these issues. In the remaining sections in this chapter I explain further the selection of Cozolino's text, the categories of primary content I devised for collecting passages from his text, the rhetorical strategies I identified, and my approach to identifying recurring themes in his book.

The second moment, called *distanciation*, involves recognizing that the text emerges within a certain historical era, and therefore its discourse refers to social practices, values, concerns, and norms of its time and place. In Chapter IV I provide the findings of my textual analysis and interpret the exemplary passages in light of the contemporary trends, practices, and beliefs about the self that scholars have identified as implicit within contemporary neuroscience. I identified ways in which Cozolino used language that was noteworthy because it combined psychology and brain functioning. For example, I noticed the use of phrases and statements that were unclear, speculative, figurative, and repetitive. As I studied his text I considered reasons why therapists might find his claims and rhetoric to be appealing, and I thought about whether the rhetorical strategies could cause readers to be confused or misled about the relationship between human experience and neurobiological functioning.

In the third moment, called *appropriation*, the researcher engages in personal reflection about his or her worldview and perspective. This facilitates a contextual

understanding of a text and its implicit meanings and ideologies. As I interpreted Cozolino's (2010) text in light of the convergence of historical factors from which the integration between neuroscience and psychotherapy emerged, I considered my experiences as a therapist and psychology student. I reflected on why Cozolino's psychotherapy recommendations might assuage readers' anxieties about validating psychotherapy practices and verifying the efficacy of psychological treatments.

For the fourth moment in a hermeneutic study, Stigliano (1989) used the term reconstruction to describe the effects of having contextualized and historically situated the practice under investigation. In this phase the practice is reframed and possibly altered after recognizing that it exists within a historical context and therefore replicates or embodies certain aspects or assumptions of that broader context. I considered how a brain-based therapy is at once a recent and historically distinct phenomenon, yet it is also a practice that understandably follows from the history of psychology and psychotherapy. My interpretation rejects the claim that late-20th century neuroscience naturally or automatically provides a better explanation for the emergence of psychotherapy theories and practices that were devised prior to recent advances in neuroimaging. However, my interpretation also recognizes that the understanding of the self as a brain is appealing to therapists and other readers because this vision follows certain beliefs about human experience, illness, and healing that have longstanding philosophical roots in psychology and psychotherapy. The reduction of psychological illness and healing to the brain appears as a materialized version of psychology's reduction of social and philosophical issues to psychological concepts explaining individual experience. These interpretations of psychotherapy practices differ from the interpretation of neuroscience-psychotherapy

integration as inevitable, universally applicable across eras and cultures, and objective or unbiased in its observations of human being.

In accordance with the fourth moment that Stigliano (1989) described, the hermeneutic interpretation of Cozolino's (2010) text is intended to change the way therapists read and implement brain-based psychotherapies. I hope to broaden therapists' understanding of the possible implications of neuroscience-informed psychotherapy discourses. Stigliano argued that a successful hermeneutic study would not consist of results claiming to confirm an independent reality. Instead, hermeneutic interpretation challenges unquestioned empiricism by revealing the social arrangements concealed by everyday, taken-for-granted discourse. This provides alternative understandings of the world. Stigliano noted that, rather than simply rejecting scientific inquiry entirely, hermeneutic studies often contribute to improvements within social institutions such as the delivery of healthcare services, "not only by increasing effectiveness, but also by loosening the grip of ideology" (p. 63). I intended for the interpretation of Cozolino's text to improve psychological treatments by encouraging therapists to consider the history of neuroscience-psychotherapy integration, and to question the cultural assumptions embedded in this growing therapy discourse.

Hermeneutic's Critiques of Intrapsychic Theory

Above I discussed the emergence of hermeneutics during the 20th century as a post-Cartesian philosophy that challenges the separateness between individual life and social context that had typically been assumed in modern era philosophy (see Cushman, 1995; Taylor, 1989). Scholars have applied hermeneutics as a critical interpretive paradigm in order to historically situate psychotherapy theories and discuss how these

theories embody moral discourses that unknowingly support certain cultural values and make claims about the best way of life (i.e., the good). The ideals of Western individualism have been reinforced in most psychotherapy theories, beginning with early psychoanalytic theory. F. C. Richardson, Fowers, and Guignon (1999) argued that psychotherapy and counseling valorize the emancipatory outlook of the modern era through promoting individual self-sufficiency, personal freedom, and autonomy over shared, voluntary social practices that comprise civil society. By doing so they may promote

A “preoccupation with the inner self” that by itself does little to restore a sense of purpose within some community of shared values, without which the conditions for personal insecurity and directionlessness may only be reinforced, promoting yet more preoccupation with inner distress. (p. 7)

Therapies that uncritically emphasize concepts such as an inner life or an inner world of each person, and describe psychological health as an inner wellbeing, may serve to reinforce a rigid divide between individual experience and social context, and therefore perpetuate a notion of the good as the isolated individual concern with personal gain. Scholars argue that encouraging this worldview ultimately leads therapists and patients to reinforce the problematic attitudes that have often caused the psychological difficulties for which patients seek therapy. For example, F. C. Richardson et al. (1999) noted that the modern era expectation of self-directed individualism leads many people to experience emotional distress and shame when their sense of autonomy fails even slightly. The authors argued that the result is a culture in which narcissism and confusion reigns among individuals as they long for meaning and purpose in a culture that discredits

shared historical traditions and common moral standards as authoritarian and therefore restrictive of individual success (see also Cushman, 1995).

Hermeneuticists argue that agency comes from recognizing that individuals are embedded in, rather than removed from their world. F. C. Richardson et al. (1999) applied the hermeneutic philosophy of H.-G. Gadamer in their argument for considering the psychotherapy relationship as a civic arrangement between therapist and patient, who exist within a shared historical context even though both have developed from a subjective personal history. Hermeneuticists have also described how the emergence of relational and interpersonal psychotherapy theories reflects broader late-20th century shifts in the configuration of the self (Cushman & Gilford, 1999). Late-20th century psychotherapy theories such as relational psychoanalysis, some humanistic-existential psychotherapies, and feminist therapy (e.g., Layton, 2009) have challenged intrapsychic, decontextualized accounts of human behavior, psychopathology, and change (Frie, 2011). Relational and interpersonal theories share an understanding that individuals cannot be understood apart from the social interactions that individual personality and behaviors emerge within, or apart from a broader cultural context in which individuals develop and live.

In my analysis of Cozolino's (2010) text I will identify whether there are ways in which he appeals to both intrapsychic, individualized understandings of the self as well as theories that challenge those understandings. This may be contradictory. However, in my textual analysis and discussion of his brain-based theory and treatment recommendations I will also identify and challenge ways in which intrapsychic, individualistic conceptualizations of self might be reinforced through a therapy discourse that

materializes psychological experience through neuroscientific interpretations of psychology and psychotherapy. In other words, in my review of his text I maintain a critical post-Cartesian position such as those supported among contemporary psychotherapy theories such as intersubjective systems theory (e.g., Stolorow & Atwood, 1994) and relational psychoanalysis (e.g., Mitchell, 1988).

In following scholars such as Cushman and Gilford (1999) and Walls (2004), relational and interpersonal understandings of selfhood, in addition to avoiding discourses that uncritically replicate the modern ideals of personhood that lead to a lack of meaning and purpose, also broaden the relevance of psychology and psychotherapy across minority groups. A White majority ideal of selfhood has traditionally consisted of an individual who achieves freedom and autonomy by overcoming rather than adhering to moral standards and historical traditions. In a pluralistic society, traditional psychotherapy theories that unknowingly embrace this vision are irrelevant for many patients. According to Walls (2004), by considering how therapist-patient interactions are reflections of the cultural beliefs and sociopolitical experiences of each participant (especially with regards to race, gender, and class), therapists consider factors beyond the traditional limited vision of therapy as a resolution of a patient's intrapsychic conflict (see also Layton 2009). This extends psychoanalytic and psychotherapy theories to populations beyond those for whom individualist accounts of psychological experience, pathology, and change have historical and cultural appeal.

A balance between an understanding of the personal and an understanding of the social is necessary to avoid perpetuating a disregard for the roles of both meaningful social engagement and shared moral standards in psychological wellbeing. Such a

balance is also necessary in order to avoid a radical postmodern position that, according to some scholars, negates the concepts of agency and subjectivity and is therefore no less problematic than classical intrapsychic theories (Cushman, 2005; Frie, 2009b; Orange, 2003). Although hermeneuticists critically examine psychology and psychotherapy by historically situating the concepts and assumptions of these fields, hermeneutics avoids a historical determinism by embracing agency and emphasizing an encounter with difference (see Cushman, 2005). Hermeneutics therefore provides a balance between intrapsychic and extreme postmodern positions that advocate for a relativism that, according to some scholars, unknowingly removes agency or a sense of freedom and choice from therapy patients (Orange, 2003) or promotes a radical individualism that is completely removed from what postmodern philosophers intended with their challenges to modernity (Cushman, 2005; Cushman & Gilford, 1999).

In sum, my critique of Cozolino's (2010) text is premised in large part on relational and interpersonal theories that challenge the modern era notion that a rigid individualism is the necessary condition for freedom and agency. I favor theories that endorse a vision of human psychology as at once individual, interpersonal, and cultural because these approaches promote more inclusive and philosophically sound mental health practices that in turn hold the possibility for a more equitable and participatory society (Layton, 2009; F. C. Richardson et al., 1999). For these reasons I will critique instances in Cozolino's (2010) text in which his brain-based therapy theory, by materializing psychological concepts and experiences, may unknowingly uphold rigid individualist or intrapsychic accounts of human psychology even when appealing to late-20th century relational theories.

Selection of the Text

I selected as my primary text Louis Cozolino's (2010) *The Neuroscience of Psychotherapy: Healing the Social Brain (2nd ed.)*. A major publishing company, Norton Books, published this text in a series of books titled the Norton Series on Interpersonal Neurobiology. These books integrate neuroscience with topics encompassing lifespan development, trauma, social work, parenting, psychotherapy, and other areas of human psychology. Daniel Siegel, who served as the series editor, has been credited with creating the phrase interpersonal neurobiology to describe his paradigm of human development that is based on a triad of psychological, neurobiological, and social development. I selected Cozolino's book because, as its title indicates, it is marketed as a psychotherapy text, and it is broad in its scope, with chapters integrating neuroscience with topics such as attachment theory, trauma and other psychopathology, and a variety of psychotherapy theories and practices. Cozolino (2010) provided brain-based explanations of the mechanisms by which psychotherapy can effectively alleviate psychological symptoms, and he described psychotherapy interventions through the lens of research in the neurosciences, thereby making claims about the relationship between mind and brain, the origins of psychopathology, and the purpose of psychotherapy. Cozolino's book provides a comprehensive overview of psychotherapy and its integration with neuroscience.

Cozolino (2010) is identified as a psychotherapist in his book. He holds the title of Professor of Psychology in the Graduate School of Education and Psychology at Pepperdine University in Malibu, California. According to his biography on Pepperdine's

website, Cozolino earned his doctorate in clinical psychology, and he also holds degrees in philosophy and theology. According to that website,

He has conducted empirical research in schizophrenia, child abuse and the long-term impact of stress. His areas of interest include neuroscience and neuropsychology, which is the integration of psychological observation on behavior and the mind with neurological observation on the brain and nervous system. In addition, he has conducted research on the biobehavioral sciences and psychotherapy. (Pepperdine University, 2013, para. 1)

The website also notes that in addition to *The Neuroscience of Psychotherapy* and various articles and book chapters about psychological issues, Cozolino also authored books titled *The Neuroscience of Human Relationships: Attachment and the Developing Social Brain* and *The Making of a Therapist: A Practical Guide for the Inner Journey*.

The website notes, “in addition to his teaching and writing, Cozolino maintains a clinical and consulting practice in Los Angeles” (Pepperdine University, 2013, para. 1).

Cozolino’s publication history and professorship, combined with his experience as a psychotherapist, suggests that he is likely to be considered an authority in the fields of psychology and psychotherapy. This also substantiates the relevance of a textual analysis of *The Neuroscience of Psychotherapy: Healing the Social Brain* for a historical interpretation of the integration between neuroscience and psychotherapy.

Research Questions

The following research questions guided my hermeneutic interpretation of the primary content, rhetorical strategies, and themes in Cozolino’s (2010) *The Neuroscience of Psychotherapy: Healing the Social Brain*.

1. According to Cozolino (2010), what is the historical fit between neuroscience and psychotherapy, and what are the implications of his claims for the purpose of psychotherapy and the identity of psychotherapists?
2. What are some of the primary functions that Cozolino's (2010) use of rhetoric served in his neuroscience-psychotherapy integration?
3. What is the understanding of self or what it means to be human that is perpetuated by Cozolino's brain-based psychotherapy theory and recommendations?
4. What are the political, economic, and social arrangements that might be unknowingly replicated by psychotherapy conducted in accordance with Cozolino's (2010) theory and recommendations?

Structure for Gathering and Categorizing Primary Content, Rhetorical Strategies, and Recurring Themes

I devised the following rubric and then I used it as a guide while reading Cozolino's (2010) text and collecting passages that were exemplary of the primary content, rhetorical strategies, and recurring themes in the text.

Primary content in Cozolino's (2010) text. For primary content I was interested in reviewing passages in which Cozolino addressed an array of topics related to the history, theory, and practice of psychotherapy, which I explicate below.

Outline and background. I first provide a brief summary of the sections or parts of Cozolino's (2010) *The Neuroscience of Psychotherapy: Healing the Social Brain*. Then I present a summary of passages in which Cozolino depicted or discussed the following topics related to the history of psychotherapy, the history of his theory,

descriptions of established therapy theories, and differences between his therapy theory and other therapies.

Tenets of Cozolino's psychotherapy theory. In this portion of my interpretation I discuss Cozolino's broadest understandings or descriptions of the purpose of psychotherapy, the general populations of psychotherapy patients or common reasons why people seek talk therapy (as well as types of abnormal behavior or psychopathology that psychotherapists treat), Cozolino's understanding of self, mind, and brain (and the relationships between those aspects of human experience), the neurobiological mechanisms of psychotherapy, the psychological mechanisms that activate those corresponding brain processes, ways in which therapists should provide therapy so that those mechanisms are utilized, and indicators of successful psychotherapy outcomes.

Case vignettes from Cozolino's psychotherapy practice. I discuss two examples of psychotherapy case vignettes from Cozolino's own treatments of patients that seemed to encapsulate some of the recurring themes or recommendations for psychotherapy practice and illustrate how he applied the tenets of his theory to psychological treatment.

Rhetorical strategies and elements of writing style in Cozolino's (2010) text. After summarizing the primary content following the outline above, I list examples of recurring rhetorical strategies or devices that Cozolino used throughout his book. I primarily referenced the *Oxford Dictionary of Literary Terms, 3rd edition* (Baldick, 2008) for my definitions of these strategies.

Analogy: A logical argument comparing two relationships between two entities or objects.

Ambiguity: Passages or statements in which an author's intended meaning was unclear because the arrangement of the statement could imply two or more distinct meanings.

Aporia: A statement by an author (or in literary works a character) that intentionally casts doubt on a main premise or purpose of his entire book that he had previously identified.

Diction: Recurring style of writing or choice of words that seemed rhetorically useful and significant.

Epigraph: Quotes preceding a book or any part of a book (such as a chapter or subsection).

Figures of Speech: I focus on the following four types of figures of speech in Cozolino's (2010) text.

Apposition: Phrases in which two nouns are placed next to each other with the intention of using one of the nouns to describe or portray some quality of the second noun.

Metaphor: A comparison between two unlike objects or entities on the basis of some shared quality, without using the words like or as.

Personification: Attributing human qualities or actions to nonhuman material objects.

Prosopopoeia: Personification of a nonmaterial concept such as memory or emotion.

Themes. For primary themes I highlight some of the broadest categories of recurring issues or arguments, and as subthemes I provide examples of Cozolino's specific applications of those arguments and issues.

In Chapter IV I outline the primary content, rhetorical strategies, and themes, and I provide passages that exemplify those topics. I also provide my initial interpretations or commentary about those passages. I used the four research questions above as guidelines for Chapter V. In that chapter I then summarize and discuss my Results chapter, Cozolino's central thesis, the historical claims he used to support the thesis, the rhetorical strategies he used to support the thesis, the understanding of self perpetuated by the thesis, the potential effects of the thesis and its understanding of self on the practice of psychotherapy and the profession of psychology, and finally, my interpretation of the political, economic, and social arrangements perpetuated by the thesis.

Definitions

For the purpose of this research study I used the following definitions of relevant terms and concepts.

Biological determinism: The ideology that favors biological or genetic explanations for all aspects of human life and behavior.

Brain-based or neuroscience-informed psychotherapy: I use these phrases interchangeably to refer to psychotherapy theories premised on the integration between neuroscience and psychotherapy. Although neuroimaging has been included in research studies of specific psychotherapy modalities (such as behavioral therapy and exposure therapy), I used these phrases to describe paradigms such as interpersonal neurobiology,

or Cozolino's (2010) psychotherapy text, which combine a variety of psychological concepts and psychotherapy theories with cognitive neuroscience findings.

Dualism: The theory that mind and body are separate. That is, nonmaterial, subjective experience is believed to exist as altogether separate from body, which belongs to the natural or physical world. Mental and physical aspects of individual experience are therefore considered separate ways of being or experiencing the world.

Eliminative materialism or eliminativism: The position that psychological concepts exist only insofar as they are found to be products of underlying physical processes. However, eliminativists predict that neural correlates will not be found for psychological concepts. Therefore in this view those concepts will be considered fictitious and should be replaced by neurobiological terminology once neuroscience research identifies the physical processes that generate behavior. This is a radical reductionism that does not view mental qualities as having corresponding physical correlates, but instead challenges the existence of human subjectivity.

Emergentism: The philosophical position that the component parts of a whole phenomenon are necessary but not sufficient for its existence. Emergentism has been used as a counter to reductionism, especially the efforts to reduce mind to the workings of the brain.

Materialism or reductive materialism: The position that mental phenomena are reducible to physical or material existence. Materialism specifically involves the mapping of mental processes to neurobiological processes.

Naturalism: The position that only the physical world is real. Naturalism is frequently aligned with the belief that the scientific method (rather than fields such as

religion or philosophy) will explain how and why the world appears and functions as it does (see scientism, below).

Rhetorical strategies or devices: Recurring uses of language and figures of speech in a text. I primarily referenced the *Oxford Dictionary of Literary Terms*, 3rd edition (Baldick, 2008) to define the rhetorical strategies I identified in Cozolino's (2010) text.

Neuroscience and neurosciences: An integrative academic discipline that emerged in the United States during the mid-20th century. One goal of neuroscience has been the use of brain research to investigate neural origins of sociological, psychological, and other phenomena.

Professional psychology and psychotherapy: Any talk therapy conducted by a licensed mental health professional, either a doctoral level psychologist or master's level mental health clinician (e.g., therapists who hold a master's degree in psychology, or marriage and family therapy, or social work but practice as licensed clinical therapists). These professionals provide psychotherapy for individuals, couples, families, and groups in a way that is consistent with state licensure and health care laws. These clinicians also follow generally accepted practices and professional psychotherapy ethics provided by national professional organizations. Ethical practices vary among organizations such as the American Psychological Association and the American Association for Marriage and Family Therapy.

Psychological or subjective experience: I use these terms interchangeably to describe conscious awareness. In my interpretations of Cozolino's (2010) text, for example, I use these terms when I discuss his views on how human psychology is related to brain functioning. With that grammar I am not intentionally recreating a dichotomy

between mental and physical experiences; instead I am distinguishing between psychological concepts that are shared understandings of human experience, and descriptions of brain functioning. I use the terms interchangeably in order to foster a flow to my writing.

Scientism: A rigid adherence to the position that natural or physical sciences will explain everything about the world and life. Proponents of scientism maintain an epistemological stance that valorizes naturalism or materialism to such a degree that non-material aspects of human experience (such as culture, subjectivity, the humanities, and religion) are either dismissed entirely or reduced to quantitative data points, or a physical location or processes within the human body.

Reductionism: The position that a whole entity or system can be understood in terms of its smaller parts. Reductionism is also used to position the concepts of one discipline or academic area as constituent parts of the concepts of a broader area of study. For example, some scientists and philosophers claim that mind is solely a product of brain functioning. This claim reduces the field of psychology to the field of neuroscience because it asserts that mind or conscious experience is better explained by brain functioning which is one constituent part of human experience.

Summary

In this chapter I described the rationale and methodology of my research project, including a description of philosophical hermeneutics and the use of 20th century interpretive theory to situate scientific efforts and achievements within the time and place in which they emerged. In the next chapter I provide the results of my textual analysis of

Cozolino's (2010) book using the outline for primary content, rhetorical strategies or elements of writing style, and recurring themes, as I described above.

Chapter IV: Results of the Textual Analysis of Louis Cozolino's (2010) *The Neuroscience of Psychotherapy: Healing the Social Brain*

In this chapter I lay out the primary content, rhetorical strategies, and recurring themes throughout Cozolino's (2010) *The Neuroscience of Psychotherapy* according to the format I discussed in Chapter III.

Primary Content

Outline and background. In this section I interpret the six parts of *The Neuroscience of Psychotherapy: Healing the Social Brain* and describe Cozolino's statements about the history of psychotherapy, the history of his theory, his descriptions of established psychotherapy theories, and his understandings of the differences between his theory and established psychotherapy theories.

The Neuroscience of Psychotherapy: Healing the Social Brain is divided into 18 chapters spread evenly across six parts. Part I includes chapters on the relationship between the professions of neurology and psychology, ways in which psychological phenomena and mechanisms of well-known psychotherapy treatments relate to neurobiology.

Part II contains chapters on the workings of the human nervous system, ways in which the brain stores memories, the differences between left and right hemispheres of the human brain, and ways in which these issues are relevant for the practice of psychotherapy.

Part III includes chapters on higher-level cognitive processes or executive functioning and the human brain, the relationship between the workings of the human brain and the ways in which the workings of the human brain impact the perception of

reality, and how the human capacity for language or narrative facilitates integration amongst brain regions.

Part IV includes chapters on the relationship between the nervous system and attachment, linking the evolution and functioning of the human brain to the social qualities of human beings.

Part V includes chapters on psychopathology, focusing on trauma and anxiety disorders, and the ways in which the quality of a child's early relationships with caregivers comes to shape personality.

Part VI includes chapters that review how psychotherapy emerged historically because of the evolution of the brain, the ways in which psychotherapy serves the purpose of altering the functioning of a patient's brain, and predictions for how psychotherapy will become closely tied to neuroscience, for example, including neurobiology terms in case conceptualizations, and using neuroimaging to plan treatment and assess psychotherapy progress.

General history of psychotherapy according to Cozolino. In this section I focus on Cozolino's understanding of the historical origins of psychotherapy.

Psychotherapy as an inevitable necessity due to the evolution of the human brain. According to Cozolino, psychotherapy emerged because it is a corrective intervention for problems created by how the human brain evolved.

Many of our most important socioemotional learning experiences are organized and controlled by reflexes, behaviors, and emotions outside of our awareness and distorted by our immature brains. To a great extent, psychotherapy owes its existence to these artifacts of evolution and development. (p. 9)

Evolution's legacy is a complex brain, vulnerable to a variety of factors that can disrupt the growth and integration of important neural networks. The field of

psychotherapy has emerged because of the brain's vulnerability to these developmental and environmental risks. (p. 11)

The human brain is an amazing organ, capable of continual growth and lifelong adaptation to an ever-changing array of challenges. Our understanding of how the brain accomplishes this mandate increases with each new theoretical development and technological advance. At the same time, we are uncovering some of natural selection's more problematic choices. If necessity is the mother of invention, then evolution itself has created the necessity for psychotherapy by shaping a brain that is vulnerable to a wide array of difficulties. (p. 306)

These statements suggested that the emergence of psychotherapy was inevitable because it serves as a cure for problems that are a result of the functioning of the human brain. According to Cozolino, the human brain evolved to have a tremendous influence over individual behaviors and experiences, which at times leads to the personal difficulties for which therapy happens to be able to remedy. His ahistorical understanding of psychotherapy depicted in these passages naturalized psychological treatments as corrective interventions for a brain that develops and learns outside of conscious control, thereby at times resulting in maladaptive behaviors and emotions. Interpretive theories and critical historians of science have challenged the common portrayal of scientific advancements as inevitable because this removes those efforts from their broader time and place. The passages above established evolution as a central organizing principle of Cozolino's theory of psychotherapy and psychopathology (see *Themes*, pp. 213-220).

Freud's rebellion against the medical establishment. According to Cozolino, Freud's early professional interest in the relationship between mind and brain was at odds with the medical establishment of his time. Cozolino implied that Freud was a maverick for having an interest in the relationship between brain and behavior, and that soon he chose to ignore this interest because it was ahead of its time. As a result he was forced to

focus instead on devising a language of psychology or mind rather than neurobiology as a way to describe human experience.

“Freud started out as a rebel, a neurologist curious about the mind. I suspect he was frustrated with the mind-brain partisanship of medical school, and longed to work with others who shared his interests” (p. 1).

It is noteworthy that Cozolino speculated about Freud’s intentions (“I suspect he was frustrated”; see also *Speculation language*, pp. 195-203) and by doing so attempted to justify the history of psychotherapy he depicted.

Despite his enthusiasm, Freud realized that his dream for psychology to be based in an understanding of the nervous system was far ahead of its time, and at odds with prevailing religious beliefs and medical dogma. For these and other reasons, he suppressed the publication of *The Project* until his death. Perhaps Freud kept the *Project* to himself because he feared that it would be relegated to the same sort of obscurity as the case of Phineas Gage. (p. 4)

Freud, the neurologist, became all but forgotten as his psychological theories moved further and further from their biological roots. He chose instead to utilize the more palatable and accessible metaphors of literature and anthropology to provide the primary vocabulary for psychoanalysis. Unfortunately, Freud’s shift from the brain to metaphors of mind opened psychoanalysis up to all sorts of criticism throughout the 20th century. Metaphors such as the Oedipal and Electra complexes were seen as contrived fictions, shielding them from scientific evaluation. Perhaps Freud anticipated that in the future, psychoanalysis would eventually be integrated with its neurobiological substrates. (pp. 4-5)

Cozolino suggested that Freud happened to be correct in understanding the human mind because his theory is now validated by recent neuroimaging research. The claim that mind is an antiquated placeholder for brain ignores the controversies associated with that type of reductionism while overlooking the differences between psychological and neurobiological understandings of self and the problems that arise when assuming that the founding principles and vocabularies of two separate fields of study are so easily intertwined. Cozolino later established the purpose of his book as purportedly revisiting

and continuing Freud's intended mapping of psychological concepts such as mind onto underlying neurobiological structures.

Cozolino's strategy seemed to be an illustration of what historians of psychology such as Danziger (1979), Furumoto (1989), and Samelson (1974) have called an "origin myth," complete with its attendant inaccuracies. Cozolino's origin myth makes an appeal on behalf of psychology to the higher-status medical specialty of neurology, claiming that psychology was initially rooted in neurology and therefore has a legitimate right to reunite with that branch of medicine now that scientific methods such as neuroimaging are providing proof of psychology's theories. Cozolino implied that psychological theories would be antiquated and unverifiable without the evidence of their relevance and timelessness provided from brain research. Cozolino's assertion is problematic in several ways. He argued that Freud's use of literature and anthropology, important elements of psychoanalytic theory, were the equivalent of historical placeholders for a theory that was actually describing the workings of the human brain. In other words, Cozolino extracted psychoanalysis (and subsequent psychological theories that emerged to either expand or supplant early psychoanalytic theory) from their connections with various humanities disciplines by arguing that such an interdisciplinary theory was not Freud's original intention or preferred path. Cozolino also asserted that psychoanalysis has been criticized because the language of literature and anthropology could not be subjected to the empirical or observable methods of scientific study, thereby implying that neuroscience provides ways of measuring human psychology that could verify psychoanalytic accuracy. This assertion is problematic because it uses a certain depiction of the history of psychoanalysis to discredit the significant and longstanding connection between

psychoanalysis and the humanities, and to argue for a correction to the generally understood purpose and rationale for psychoanalytic or psychotherapy treatment. His interpretation of the history of psychoanalytic theory was used as a rationale for combining brain research and human psychology into a single endeavor, yet he overlooked ways in which psychology and neurology might have distinct goals or represent distinct understandings of self.

The history of psychotherapy was similar to the history of other scientific discoveries. In the following passage Cozolino asserted that psychotherapy was devised through a process similar to the methodology of scientific experiments. He illustrated this assertion with an example of how a psychoanalytic explanation for the effectiveness of electroshock therapy has been deemed obsolete.

Like other scientific discoveries, psychotherapy developed from a combination of trial-and-error learning, the intuition of its founder, and plain luck. Each school of psychotherapy offers an explanation of mental health and illnesses as well as why its strategies and techniques are effective. Fortunately, the effectiveness of an intervention does not depend on the accuracy of the theory used to support it. For example, there was a time when psychoanalysts attributed the success of electroshock therapy to the need of a depressed person to be punished. The treatment worked and still works despite the lack of a solid understanding of its mechanisms of action. (p. 32)

Here Cozolino argued that scientific discoveries or advancements are products of the individual genius of the researchers associated with those discoveries, thereby implying that psychotherapy was inevitable or waiting to be uncovered based on improving upon whatever scientific research or findings preceded it. He claimed that effective therapy practices arose through “plain luck,” and he portrayed them as a set of experiments or interventions that have been refined for efficacy over time rather than discourses that embody cultural definitions of illness and health. His argument took for

granted a modern era, progressive theory of truth (see Leahey, 1992). This view of psychology as a progressive science is disputed by the interpretive turn in philosophy and should not simply be taken for granted as an unquestioned truth (see Gadamer, 1975).

Also noteworthy was Cozolino's statement describing how psychological treatments have at times been recognized as efficacious or successful despite the inaccuracies of psychotherapy theories used to explain successful treatment results. His argument and subsequent example of electroshock treatment warrants discussion. Given his understanding of self, his interpretation of the functioning of the human brain, and his recommended therapy interventions drawing from psychoanalytic theory, it was surprising that he criticized a psychoanalytic interpretation of a mental health treatment without providing any alternative hypothesis about electroshock therapy's success. He seemed to subtly discredit the value of traditional psychoanalytic theory by implying that a nonmaterial view of mood or personality has no value as one possible explanation for a mental health treatment with an apparent physiological component. His statements also imply that accurate explanations for psychological phenomena and treatments must be provided by neuroscience research even if psychologists must continue to wait for that research to be conducted. Further, since electroshock therapy is obviously a physiological intervention that produces a reduction of symptoms of disorders typically classified as psychological, the passage might convey that psychological theories have no relevant place in the scientific quest for physiological explanations for apparently physiological interventions. This is a noteworthy implication for a book that is branded as a psychotherapy text.

Psychotherapy has been a neurobiological intervention without therapists knowing it. Throughout his book, Cozolino described psychotherapy interventions as successful to the extent to which they change the functioning of the human brain. He suggested that this has always been true yet recently has been proven through advancements in neuroimaging technologies.

“It is my belief that the development of psychotherapy has always been implicitly guided by the principles of neuroscience” (p. 31).

Over the last century, psychotherapists have demonstrated that many of the brain’s shortcomings can be counterbalanced by the application of skillfully applied techniques in the context of a caring relationship. Thus, in our ability to link, attune, and regulate each other’s brains, evolution has also provided us a way to heal one another. Because we know that relationships are capable of building and rebuilding neural structures, psychotherapy can now be understood as a neurobiological intervention, with a deep cultural history. In psychotherapy, we are tapping the same principles available in every relationship to connect to and heal another brain. (p. 306)

Cozolino argued that psychotherapy has always been a method of intervening on the human brain in order to achieve whatever outcomes had been deemed desirable for a mental health treatment. The rationale for his rhetoric was dependent on his understanding of brain science as transcending the unique cultural and historical circumstances from which psychotherapy emerged and developed over the 20th century. It was unclear whether Cozolino intended to reappropriate the phrase “cultural history” to mean that psychotherapy (now explained as a “neurobiological intervention,” a purported correction to earlier understandings of human psychology and the purpose of psychotherapy) has a history within a certain culture, since the phrase “cultural history” also refers to the type of alternative history that situates phenomena within a specific cultural context (e.g., the hermeneutic interpretation of brain-based psychotherapy texts

presented here). If in fact he meant to align his work with a hermeneutic approach, he failed. His use of neuroscience to explain the purpose and efficacy of psychological treatments overlooked the important cultural and historical understandings of health and illness from which psychotherapy theories emerged.

Overall, Cozolino's depiction of the general history of psychotherapy suggested an attempt to portray psychotherapy as a scientific endeavor through his use of the common elements of standard science histories that rely on inevitability, linear progress, and the attributing of advances to the individual genius of their creators or founding theorists. These explanations stand in direct opposition to interpretive or cultural histories of science that challenge the assumption that scientific advancements may be extracted from the time and place in which they gained popularity and relevance. He achieved this argument by appealing to the use of neuroscience as the higher-order field that validates psychotherapy theory and practice, and he portrayed therapy as originally having emerged from neurology before it strayed from its physical science origins. In this way he simplistically portrayed theories of mind or psychological processes as descriptions for human experience that could easily be mapped onto their rightful material substrates, rather than as theories for understanding human experience that have a longstanding and unique history which has contributed in important ways to the understanding of self in Western cultures.

History of Cozolino's psychotherapy theory. In this section I review Cozolino's statements about how and why he devised his theory, that is, his understanding of the specific historical antecedents of his psychotherapy text.

Revisiting the overlap between neurology and psychology now that the relationship between mind and brain has been established as a unified process. Most broadly Cozolino described his efforts as a reintegration between psychology and neurology now that neuroscience research has highlighted changes in the human brain that occur in response to psychological experiences and treatments.

How does the brain give rise to the mind? Where do the brain and mind meet, and by what means do they interact with one another? These are difficult questions—so difficult, in fact, that the common reaction is to focus on either the mind or the brain and act as if the other is irrelevant (Blass & Carmeli, 2007; Pulver, 2003). The problem with this approach is the barrier it creates to understanding that the human experience of brain and mind is essentially a unified process (Cobb, 1944). Neurology and psychology are simultaneously pushed apart by academic and intellectual politics while being drawn together by their common psychobiological foundation. (Cozolino, 2010, p. 1)

This was the opening statement of Cozolino's book. He asserted that brain and mind "is essentially a unified process," citing a 1944 reference rather than recent neuroscience research. As a reason for why people focus dichotomously on either mind or brain, rather than noting the differences in the understanding of self or the longstanding unique purposes between various professions or academic areas, he provided the explanation that questions involving the relationship between mind or psychological experience, and brain or physical matter, are complex and difficult. That statement disregarded the possibility that people study one or the other because they reject an assumed unity between mind and brain, or they question the rhetoric or methods used to combine the separate areas of study, or simply that differentiating between mental and physical aspects of human beings provides a broader scope of research and understanding of human beings than attempting to unite those interests into a single field. Cozolino did not clarify whose "common reaction" he was referring to with this

statement. He noted “politics” as the reason why neurology and psychology remain distinct professions but it was unclear why neurologists would benefit from focusing on psychological issues amidst medical treatment of neurological disorders, and it was also unclear why psychologists would benefit from redefining themselves through a kinship with neurologists. With these opening statements Cozolino juxtaposed two separate issues—the areas of overlap between neurology and psychology, and the correlations between mental (mind) and physical (brain) processes.

Cozolino’s hope for an integration between the professions of neurology and psychology seemed to be justified in part because of Freud’s initial training as a neurologist. However, neurology is a branch of medicine that researches and treats physical disorders of the brain and nervous system, whereas psychology is a broad multidisciplinary field that draws from the humanities and is comprised of philosophical, cognitive, behavioral, and mental health research and practice. Therefore, it is unclear from these statements why the two fields should merge simply on the basis of Freud having transitioned in his career from a physician treating neurological disorders to a physician treating psychological symptoms or conditions through psychoanalytic or talk therapy treatment. In fact, there are scholars who have argued that Freud’s shift from neurology to psychology was well documented to be a conscious intellectual choice, not a disguise or strategy (see Brothers, 2001; Orange, 2003).

Cozolino claimed that his book was a return to Freud’s initial intention to understand human psychology through the workings of the brain. According to Cozolino, Freud’s hope for a neurobiological study of human psychology is possible now that

neuroimaging methods are available, and also because both psychology and brain research are each widely respected.

Perhaps Freud anticipated that in the future, psychoanalysis would eventually be integrated with its neurobiological substrates. . . . The time for such an integration has arrived, and respect for psychological processes have taken a strong enough hold within both the scientific community and general culture that we can avoid a reduction of the mind to basic biochemical processes. On the contrary, an appreciation for the structures and functioning of the brain by nonneurologists has become the norm. It is in this spirit that we turn our attention to ways of thinking about the brain that enhance our understanding of human experience. (p. 5)

“As we approached the 21st century, neuroscience began providing us with tools to explore what happens in the brain during early development, and later in psychotherapy. A return to Freud’s *Project* is finally at hand” (p. 12).

As noted above, Cozolino argued that psychoanalytic theory emerged when historical circumstances dictated that Freud needed to devise descriptions and explanations for human experiences that only appear to be nonmaterial, despite his initial hypothesis that the mental or psychological experiences he was describing were actually products of their neural underpinnings in the human brain. In this passage it was unclear whether Cozolino’s statement “we can avoid a reduction of the mind to basic biochemical processes” was intended to refer to readers of his book specifically, or to individuals in contemporary culture generally when interpreting literature examining the relationship between psychological phenomena and neurobiological processes. His understanding of the historical antecedents of his book were also confusing because the phrase “on the contrary” seems misplaced, since the subsequent statement, “an appreciation for the structures and functioning of the brain by nonneurologists,” seemed more likely, not less likely, to cause readers to interpret his text as evidence supporting a reduction of mind to brain. Literature from a variety of fields including philosophy, history, and even

neuroscience has studied the influence of neuroscience research on popular culture and cautioned against the assumption that human psychology or mind can be easily understood as a product of neurochemical processes. Given that Cozolino's theory might well be interpreted to be such a reduction, it is surprising that he dismissed so abruptly the possibility that efforts to integrate neurology and psychology through mapping mind or psychological theories onto brain might be interpreted as reductionism.

In sum, Cozolino described his efforts as picking up where Freud left off when he realized that his initial goal of mapping psychopathology and the talking cure onto the functioning of the brain was not feasible without the technological advances and a wider appreciation for the brain that emerged later in the 20th century and which Cozolino is now in the position to access. In this way Cozolino portrayed a great deal of psychology and psychotherapy as a placeholder for brain-based theories of psychotherapy for which his book was intended to serve as a foundation given its broad and theoretically integrative scope. This justification was based on his origin myth. Although it is true that an interest in brain science is popular, the implications of defining therapy in this way warrant closer scrutiny.

Examples of established psychotherapies described by Cozolino. In this section I provide examples of how Cozolino described psychotherapy theories that he identified as either well known or otherwise already established.

Psychoanalytic and psychodynamic therapies. In following passage Cozolino explained how psychoanalytic theory actually describes the structures and functions of the brain.

Despite a conscious awareness that something may be wrong, the hidden layers of neural processing continue to organize the world based on the prior experiences that shaped them. As we will see in later chapters, the neural circuitry involved with fear has a tenacious memory and can invisibly influence conscious awareness for a lifetime. Part of psychodynamic therapy is an exploration and uncovering of this unconscious organization of experience. Freud's *projective hypothesis* described the process by which our brains create and organize the world around us. As the clarity of a situation decreases, the brain naturally generates structure and projects it onto the world. (p. 34)

In this description of psychoanalytic and psychodynamic therapies Cozolino focused on a material explanation, localized in the brain, of what theorists refer to as the unconscious, or aspects of experience for which a person is unaware yet may be observable to therapists by the way patients respond to ambiguity or try to make sense of the world. Cozolino argued that these unconscious elements of experience are indications of how the brain works to project itself onto the world. In other words, Cozolino posited the brain rather than the patient as the single, true object of analysis, thereby interiorizing and reducing self to a physical organ.

Rogarian or client-centered therapy. In the following passage Cozolino described the theory of pioneering humanistic psychologist Carl Rogers.

Over the last century, the therapist attributes suggested by Rogers and what we have come to think of as the best possible attitudes for optimal parenting have become essentially identical. Rogerian principles lead to a minimized need for defensiveness and shame while maximizing expressiveness, exploration, and risk taking. Rogers was likely describing the best interpersonal environment for brain growth during development and neural plasticity in psychotherapy when he stated that client-centered therapy “aims directly toward the greater independence and integration of the individual rather than hoping that such results will accrue if the counselor assists in solving the problem. The individual and not the problem is the focus.” (Rogers, 1942, p. 28, as cited in Cozolino, 2010, p. 37)

Cozolino argued that Rogers' description of his client-centered psychotherapy paradigm was unknowingly a description of the best relationship qualities to promote

optimal brain development and change. Cozolino then cited Rogers' explanation of client-centered therapy as focused on the individual rather than focused on problems. In other words, Cozolino subtly redefined individual as brain. In this passage Cozolino also compared parenting and psychotherapy by arguing that the most favorable qualities for child development are analogous to the qualities of the psychotherapeutic environment. The connection between parenting and psychotherapy then became a primary issue in his book (see also *Analogy*, pp. 175-178).

Cognitive therapies. In the following passage Cozolino explained how cognitive therapy alters patients' brains, and he also discussed how these modalities have been well represented amongst psychotherapy studies that have used neuroimaging to evaluate treatment efficacy.

“Cognitive therapies highlight the centrality of a person's thoughts, appraisals, and beliefs in guiding his or her feelings and actions” (p. 39).

Of all the different types of therapy, specific links have been found between successful cognitive-behavioral therapy and changes in brain functioning. . . . These findings strongly suggest that therapists can utilize cognition to alter the relationship among neural networks in a way that impacts their balance of activation and inhibition. In striving to activate cortical processing through conscious control of thoughts and feelings, these therapies enhance left cortical processing, inhibiting and regulating right hemispheric balance and subcortical activation. The reestablishment of hemispheric and top-down regulation allows for increases in positive attitudes and a sense of safety that counteract the depressing and frightening effects of right hemisphere and subcortical (amygdala) dominance. (Ochsner & Gross, 2008, as cited in Cozolino, p. 40)

“The inherent wisdom of this approach with depressed and anxious patients lies in the fact that disorders of affect need activation of cortical executive structures” (p. 41).

Cozolino identified cognitive therapy as the approach that has been most validated by neuroscience research, and he noted the suspected neurobiological

mechanism or process by which psychological interventions are purportedly effective. This suggested that neurobiological changes spurred by other therapy paradigms have been at least partly inferred from neuroimaging studies of cognitive therapy patients. His claim that “the inherent wisdom” of cognitive therapy for depression and anxiety is the need for “activation of cortical executive structures” implied that neuroimaging confirms that therapists have unknowingly been impacting the structures and functioning of the brain during treatment.

Systemic family therapy. In the following passage Cozolino argued that systems theories actually describe how patterns in human relationships become embedded in brain functioning of each individual in the system.

“Dysfunctional family patterns . . . sacrifice the growth and well-being of one or more members (often the children) to reduce the overall level of anxiety in the family” (p. 42).

Over time, the dysfunction becomes embedded in the personality and neural architecture of everyone in the family and they collude to maintain the system, because they now all require the status quo in order to feel safe. These experiences become embedded into their neural architecture and are carried forward into adult relationships. (p. 42)

As in other forms of psychotherapy, the goal of systems therapy is to integrate and balance the various cortical and subcortical, left and right hemisphere processing networks. . . . In essence, Bowen is highlighting that the simultaneous activation of cognition and emotion leads to neural integration. (pp. 42-43)

The first step in systems therapy is to educate the family about these concepts and to explore the history of both sides of the family through the past few generations. . . . Uncovering family secrets and reality testing around the myths and projections of each family member allow for cortical processing of primitive and unconscious defenses. (p. 43)

In his description of systems therapy Cozolino asserted that relationship dynamics or patterns between family members become imprinted as neural patterns of each

member's brain, causing people to strive to maintain homeostasis to avoid the anxiety caused by the threat of change. Cozolino's fusion between systems dynamics and individual brain patterns seemed contradictory and antithetical to systems theories' challenge to mainstream psychology's focus on the individual as the primary unit of analysis or location of psychological symptoms.

Cozolino's descriptions of these traditional therapy theories portrayed a materialized intrapsychic self, persons as individual brains, physical locations of the mechanisms of therapeutic efficacy, and individualized accounts of human relationships. All of these brain-based descriptions of psychotherapy theories overlooked how the claim of having discovered the material origins of longstanding psychological treatments is a reinterpretation of theories in accordance with a neuroscientific understanding of self rather than an uncovering of a true understanding of development, illness, and healing. Cozolino's brain-based depiction of family systems theory was especially striking given that family therapy theories have viewed psychological problems and solutions as residing between members rather than intrapsychically in the interior of any one person. The use of a brain-based interpretation of systems theory illustrated how a brain-based interpretation of social or relational theories might be contradictory.

Differences between Cozolino's theory and established psychotherapy theories.

In this section I identify passages in which Cozolino described his psychotherapy theory as a unique psychotherapy theory or practice, or as an original interpretation of already-established psychotherapy theories and practices.

Understanding the underlying neurobiology of effective psychotherapies rather than creating a new one. Cozolino did not create a new psychotherapy theory or specific

psychological treatment. Instead, he focused on a theoretical integration between already-existing psychotherapy theories on the basis of a brain-based interpretation of several well-known psychotherapies and common factors of effective psychotherapies.

From my perspective, the value of neuroscience for psychotherapists is not to explain away the mind or generate new forms of therapy, but to help us grasp the neurobiological substrates of the talking cure in an optimistic and enthusiastic continuation of Freud's *Project for a Scientific Psychology*. (p. 358)

In this statement on the last page of his book Cozolino denied that he intended to promote a reduction of mind to brain, and he also denied that his book had been an attempt to create a new therapy theory. Although he denied attempting to use neuroscience to reduce mind to brain, he then described neuroscience as valuable for a “continuation” of Freud’s initial intention for a brain-based paradigm explaining human behavior or experience as neurobiological processes. This attempt to depict Freud’s psychoanalytic theory as simply a placeholder for a psychotherapy-neuroscience integration overlooked the substantial effects of psychological and psychotherapy theories and practices on Western cultures, and Western cultural trends embodied by psychotherapy theories during the intervening decades of the 20th century. The claim that he was attempting to link his theory to Freud’s original intentions was part of Cozolino’s origin myth strategy (see above).

Using neuroscience in support of, or as a means for psychotherapy integration.

Cozolino’s use of neuroscience as a means for psychotherapy integration was an important premise of his book.

“Whether it is called symptom relief, differentiation, ego strength, or awareness, all forms of therapy are targeting dissociated neural networks for integration” (p. 46).

Cozolino's statement suggested that various understandings of ideal therapy outcomes are all descriptions or interpretations of neural network integration, and therefore should be combined under the overarching field of neuroscience, rather than combined according to psychological common factors or differentiated according to the unique understandings of self that psychotherapy theories embody. In my review of literature relevant to the integration between neuroscience and psychotherapy (see Chapter II) I discussed similar arguments put forward by other theorists and psychotherapy authors. This proposal appears to offer hope for establishing with certainty a set of best practices in psychotherapy that would transcend the contentious debates among advocates of disparate psychological research methodologies about what constitutes psychological change and successful treatment. However, forfeiting the debate entirely in an effort to simply subsume the entire enterprise of psychotherapy integration and psychotherapy outcome research under the higher-status domain of neuroscience research is a rewriting of the purpose of psychotherapy treatment, and it is reductionist. In the following passage, Cozolino described psychotherapy in exclusively neuroscientific terms.

When theories of neuroscience and psychotherapy are considered side by side, a number of working hypotheses emerge. First, given that the human brain is a social organ, safe and supportive relationships are the optimal environment for social and emotional learning. . . . Second, we appear to experience optimal development and integration in the context of a mild to moderate level of arousal or what we might call *optimal stress*. . . . A third hypothesis is that the involvement of affect and cognition appears necessary in the therapeutic process in order to create the context for integration of neural circuits with a high vulnerability to dissociation. . . . Fourth, the co-construction of narratives between parent and child or therapist and client provides a broad matrix supporting the integration of multiple neural networks. (pp. 46-47)

Cozolino argued that these four factors are common to effective psychotherapies because they appeal to some core traits or characteristics of the human brain, thereby activating networks in the brain in a certain way that makes therapy an effective psychological treatment through promoting the optimal functioning of the brain. By attributing neural integration to the combination of “safe and supportive relationships,” “optimal stress,” “the involvement of affect and cognition” and “the co-construction of narratives,” he described these important aspects of human psychology and development as central to patient health and wellbeing because of the effects of these conditions on the brain. This was one significant example of how he conflated personhood with the individual brain, repurposing psychotherapy in addition to his stated focus of validating already-existing practices. In other words, although Cozolino did not advocate for a therapy process or series of psychological interventions that might outwardly appear new, his re-visioning of therapy as effective for a brain rather than for an individual has important implications for how therapists think about their role as clinicians, the purpose of treating patients, and the proper area of study for psychological research methods.

In the following passage, Cozolino’s description of psychotherapy theories and neuroscience as both “heuristics” was noteworthy because he used that concept to describe both fields, and then he ascribed different qualities to each one.

Although each approach to psychotherapy is experienced as a fundamental truth by its disciples, all modes of therapy are actually *heuristics*. Heuristics are interpretations of experience or ways of understanding phenomena. The value of a heuristic lies in its ability to organize, explain, and predict what we observe. Neuroscience is another heuristic, one that we are using in the present discussion to explain the mechanisms of action of psychotherapy; in other words how and why it works. It is my belief that neuroscience is a helpful heuristic that will lead

us to a fuller understanding of the process of psychotherapy and may also serve as a rational means of selecting, combining, and evaluating treatment modalities. (p. 33)

In this passage Cozolino seemed at first to claim that neuroscience, similar to “each approach to psychotherapy,” might simply appear to be another paradigm masquerading as a “truth.” However, a closer reading suggests that by describing the heuristic of neuroscience as serving “to explain the mechanisms of action of psychotherapy,” Cozolino implied some primacy or transcending quality of neuroscience as an explanation of efficacy currently missing from psychotherapy theories. The way the passage was worded implied that the value of neuroscience for all psychotherapies is greater than the value of any particular psychotherapy since therapies are experienced as “a fundamental truth” by the “disciples” or followers of that therapy. In other words, he used the word heuristic to relegate all specific psychotherapy approaches to the status of “interpretations” that are merely experienced as truth for the fans of that theory. Cozolino claimed that neuroscience is a proper means of psychotherapy integration because of its ability to explain contentious issues across modalities, rather than as a way to interpret phenomena myopically as he accused discreet therapy theories (or at least their followers) of doing. This seemed to be a roundabout way of advocating for psychotherapy integration through reductionism.

My hope is that including neural network activity in our case conceptualization may help to establish a common language for us to select, combine, and evaluate the treatments we provide. It will, one hopes, help us to move past debates between competing schools of thought to a more inclusive approach to psychotherapy. (p. 353)

This was another statement advocating for neuroscience as a means of establishing best practices from among a vast array of varying talk therapy theories. In

this passage there was a general sense that neuroscience could offer the hope for improving psychotherapy as a profession. The prediction that neuroscience will be used as a uniting paradigm overlooked the absence of much agreement among therapists or theorists about fundamental issues related to the meaning and nature of mental illness and their treatment. It would also require a rather uncritical approach to the meaning and nature of neuroscience. His claims in these passages were highly suggestive of a reduction of psychology to neurobiology.

Predicting future involvement of neuroscience in psychotherapy practice.

Although he denied that his psychotherapy recommendations were meant to serve as a new and unique psychotherapy practice, and instead argued that his efforts represented a brain-based understanding of current psychotherapies and psychotherapy integration, Cozolino's predictions for the future involvement of neuroscience in psychotherapy were bold.

As part of an initial assessment, [neuroimaging] could help therapists pinpoint areas of neural activation and inhibition. Treatment planning will eventually come to include specific psychotherapeutic and pharmacological interventions to enhance the growth and integration of affected networks. Regular scans during the course of therapy may someday be a useful adjunct to psychological tests, as ways of fine-tuning the therapeutic process and measuring treatment success. (p. 345)

These predictions of a close relationship between psychotherapy and neuroscience in Cozolino's final chapter (titled "The Psychotherapist as Neuroscientist," pp. 341-358) were striking. Writing case conceptualizations in a neurobiology vernacular, or using neuroimaging to monitor psychotherapy patients' progress in treatment might sound exciting to readers and appeal to an ideal of a more exacting, scientized future that is drawing near. However, Cozolino neglected to describe further any specific details for

how those plans would be widely implemented or why they might be helpful for patients, or what would be the consequences of linking psychotherapy with neuroscience in such a sweeping way.

In sum, Cozolino identified his theory as an attempt at psychotherapy theory integration and he predicted a future in which the practice of psychotherapy will be closely aligned with neuroscience. These were dramatic predictions and reductionist interpretations that warrant examination in light of the criticisms that some scholars have raised against the claims and rhetoric used to depict the relationship between mind and brain. With all of these predictions Cozolino took for granted the significance of neuroscience in popular culture and in the understanding of self in contemporary Western cultures. Although techniques similar to those that he predicted are already practiced by some specialized psychologists, his casual prediction for these practices to become widespread assumed that these changes to typical psychotherapy practice could be feasible or at least without reason for concern about the implications of turning talk therapy practice into a technicized neuroscientific intervention as the standard for patient care.

The tenets of Cozolino's psychotherapy theory. In this section I focus on Cozolino's broadest understandings or descriptions of the purpose of psychotherapy, the general populations of psychotherapy patients or common reasons why people seek talk therapy (as well as types of abnormal behavior or psychopathology that psychotherapists treat), Cozolino's understanding of self, mind, and brain (and the relationships between those aspects of human experience), the neurobiological mechanisms of psychotherapy, the psychological mechanisms that activate those corresponding brain processes, ways in

which therapists should provide therapy so that those mechanisms are utilized, and indicators of successful psychotherapy outcomes. (For quotes from Cozolino's text for all of the following subsections, see Appendix A, pp. 298-324).

The definition or general purpose of psychotherapy. In this section I examine Cozolino's broadest descriptions of psychotherapy.

Psychotherapy as a venue for neural integration. Cozolino defined psychotherapy by its potential to restore neural integration or proper connectivity between brain regions. He asserted that therapies are able to be distinguished on the basis of which neural networks are involved, rather than on the basis of the tenets of the treatment, or the underlying assumptions about human behavior, change, health, or the best way of life—that is, aspects of self—constructed by an array of shared social and cultural values. He instead reduced those broadly shared values to neural networks within an individual's brain that he believed to be specifically influenced or activated in response to the “enriched environment” (p. 20) of therapy. In other words, he defined psychotherapy by the neurobiological mechanisms of change suspected to be involved with treatment.

According to Cozolino, the neurobiology that confers upon humans the potential to experience psychological problems is the same neurobiology that confers upon humans the capacity to reverse or remedy those problems in psychotherapy. In that way, human problems and their cures are highly individualized and the same process that explains the existence or continuance of individual difficulties (lack of neural integration) is related to the process that corrects those difficulties (establishing neural integration). This explanation was accomplished through a highly reductive understanding of problems and cures as physically localized and therefore able to be physically manipulated through the

qualities of the nonmaterial relationship and discourse of talk therapy acting in a material or physiological way on the human brain.

Psychotherapy as a relationship that is similar to other relationships that facilitate neural integration. Cozolino equated therapy with other human relationships that result in healing and corresponding brain change. His argument suggested that there is nothing inherently special or unique about the psychotherapy relationship, since its potential for healing exists in other relationships insofar as those other relationships produce similar changes in an individual's brain. This was a significant claim that could contradict the unique philosophies and history embedded within the practice of psychotherapy.

By viewing therapy as a venue for neural integration that is similar to other relationships that facilitate healing through identical neurobiological change, Cozolino at once reduced psychotherapy to technical interventions that alter the brain while subtly implying that there is nothing inherently unique to the institution of psychotherapy or to the outcomes it may confer upon patients.

General reasons why people seek psychotherapy. In this section I address the broadest reasons that Cozolino provided for why people seek or attend psychotherapy, such as general descriptions or typical populations of psychotherapy patients.

A lack of "optimal" neural functioning is implicated in the problems for which people seek treatment with psychotherapy regardless of the severity or types of problems. Cozolino asserted that all psychotherapy patients receive treatment for problems that are manifestations of their underlying neurobiological correlates, regardless of the degree of severity or symptomatology. In other words, he argued that whether a patient seeks

therapy for treatment of mental illness or general life issues that do not warrant a psychological diagnosis, there is some aspect of the functioning of the patient's brain that is relevant to the presenting problem and implicated when psychotherapy is successful. He speculated that neuroimaging might confirm this if neuroimaging studies of psychotherapy patients did not focus exclusively on treatment studies of specific mental illnesses, but instead broadened to include patients whose general personal issues or problems have not resulted in serious functional impairments. This materializing of all psychological difficulties and stressors was a significant claim in its assertion that even a lack of mental illness still implies that psychotherapy is a brain-based treatment.

Psychotherapy remedies problems that result because the human brain initially develops in accordance with early childhood experiences. According to Cozolino, early development influences later physiological and psychological wellbeing because brain development is sensitive to early negative interpersonal experiences (as well as later psychological traumas). He implied that individual functioning is determined early in the lifespan because the brain is especially adaptable to its surroundings during that phase of development. The brain was therefore portrayed as the source of individual personhood, and parenting was portrayed as significant for its effects on neurobiological development.

Patients are often being held back in their potential to enact desired changes because of the way in which their brains have constructed reality. Cozolino's brain-based psychotherapy integration was based on the premise that the human brain constructs reality, guides an individual's perceptions of reality, shapes personal identities, and in many ways exerts a vast amount of control over human behaviors and experiences. By redefining the unconscious mind as "hidden layers of neural processing" (p. 133),

Cozolino provided a materialized or brain-based explanation for patients' hindered personal growth or inability to change in the way that they think they need or desire. This reiterated the idea that changing oneself entails changing one's brain, and that the task of helping patients understand what is dissociated or outside of their awareness is a process of revealing the workings of hidden parts of the brain whose distortions are knowable only through patients' perceptions, thoughts, or interpretations of reality. Because the pertinent brain layers are allegedly hidden there seems to be faith required to believe that these brain structures exist, or faith that neuroscience will eventually discover them through continued advances in imaging technology. The hope that neuroscience will provide explanations for human propensities, values, and behaviors is deeply tied to the biomedical self described by scholars such as Vidal (2009) and Moreira and Palladino (2005).

Psychological defenses (also described as the adaptations of neural networks) are no longer effective for coping. Cozolino explained that patients seek treatment when the usefulness of typical coping strategies have been exhausted. He mapped the psychoanalytic concept of defense mechanisms onto "neural networks" (p. 34), noting that people often seek treatment when their usual ways of dealing with their symptoms have been rendered ineffective, and as a result they can no longer ignore or deny their psychological distress or symptoms. Although people were described as the entity that seeks treatment, neural networks were described as the entity that "adapts to cope with emotional stress" (p. 34). In other words, Cozolino ascribed the flexibility or adaptability of human beings to the neural networks in the human brain, thereby materializing an intrapsychic view of self (see also *Personification*, pp. 209-211).

All of these explanations for why patients attend therapy reduced the immense array of psychological conditions and general life problems typically treated in talk therapy to malfunctioning neural correlates. In general, even though Cozolino noted that social factors such as early relationships with caregivers may contribute to later mental problems, problems were typically depicted as individualized rather than systemic and interiorized rather than relational.

The definition and etiology of psychopathology. In this section I highlight Cozolino's definition and descriptions of psychopathology or established mental disorders, categories of abnormal psychology, or diagnosable psychological conditions.

Mental disorders are types of inadequate neural integration. Cozolino broadly defined psychopathology as a lack of optimal neural network integration, and he provided specific examples of mental disorders or conditions that neuroscience research has confirmed as being "linked to deficits in the integration and balance among the cerebral hemispheres" (p. 106). At times it was unclear whether he attributed the origins of an individual's psychopathology to the functioning of the human brain, or whether psychopathology has simply been observed to have neural correlates in the human brain (see also *Ambiguity*, pp. 171-178). Regardless, Cozolino paired the concept of mental disorder with the concept of inadequate or imbalanced integration between brain structures and functions. Through this understanding of psychopathology, mental or psychological conditions were portrayed as internalized by mapping an array of psychological symptoms onto individual neuroanatomy. This was significant because it implied an understanding of human difficulties as intrapsychic rather than interpersonal.

Humans have the potential to experience psychopathology because of how the brain evolved. Cozolino's understanding of psychopathology illustrated the centrality of evolutionary theory in his book (see *Themes*, pp. 213-220). According to Cozolino, psychopathology results from neurological processes that date back to the earliest human history, yet in modern life those processes are now often understood to be inappropriate or unreasonable psychological responses for the contemporary contexts or situations in which individuals might experience them. He suggested that because of the advancing complexity of the human brain over the course of human history, the experience of anxiety, for example, is the same fundamental process regardless of the psychological issue that is causing feelings of fear or worry, or the context in which those feelings are experienced. For example, he illustrated this argument by equating a physiological reflex resulting from an unexpected physical sensation with an "existential crisis" (p. 239) about issues that are not immediately inflicting physical harm upon a person. In other words, his understanding of all psychological distress as products of natural physiological processes regardless of the circumstances in which they occur was a reductionist understanding of problems of self, and exemplified his attitude of inevitability with respect to psychological problems and treatments that he described as timeless and natural occurrences.

The continuum of normality to abnormality represents a continuum of stress responses. Cozolino described stress as essential for healthy childhood development and later for effective psychotherapy when experienced in the correct amounts, yet quite harmful psychologically when individuals become overloaded with it, asserting that lasting anxiety and symptoms of psychological trauma often result from an

overabundance of stress. Cozolino explained the severity of both psychological and neurobiological indicators of trauma as correlating with the phase of individual development in which the trauma occurs, and the duration of the trauma. He identified neglectful, abusive, or otherwise harmful parenting as resulting in later psychological difficulties while asserting that ideal parenting leads to a proper balance of stress hormones in a child's body and a proper integration of experience by a child's brain. In these passages Cozolino implied that on a continuum from normality to abnormality, coherence among various aspects of human functioning ("sensation, perception, and emotion"; p. 151) are made possible by neural integration while symptoms of severe posttraumatic stress disorder indicate the most serious disruptions of neural integration and the "experience of self" (p. 151). In other words, he used his focus on trauma and dissociation to interpret psychopathology as a disruption in both neural integration and coherency of self, thereby portraying a close association between brain functioning and self.

Psychopathology resulting from nonsecure attachment experiences. Cozolino equated secure attachment with psychological wellbeing, and he associated insecure attachment with psychopathology. He claimed that a child forms a secure attachment with attuned and caring parents, which influences the development of the brain in a way that is likely to promote later mental and physical health. Cozolino reduced the parent-child relationship to the effects of that relationship on the child's brain, thereby technicizing and individualizing the parent-child relationship. Cozolino wrote that attachment schemas are stored "within networks of the social brain," (p. 198) thereby attributing social aspects of humans to a hypothesized innate drive in the brain for

attachment and the formation of relationships. The psychological concept of repeating relationship patterns in accordance with early experiences was materialized onto the brain and rewritten as “implicit” (p. 198) products of brain functioning that occur outside of individual awareness. One passage in this section was especially noteworthy for Cozolino’s assertion that aggressive and violent behaviors including acts of domestic violence may result from how early nonsecure attachment impacts the developing brain (p. 234). His simple and abrupt explanation overlooked the culpability of perpetrators of these crimes, as well as broader cultural understandings that may contribute to violence within relationships that is disproportionately committed against women and children.

Overall, these understandings of psychopathology mapped psychological symptoms onto the human brain, naturalizing and reducing them in order to portray them as disruptions in the coherent experience of self that results from inadequate neural integration. Cozolino described trauma and dissociation by their intrapsychic effects that he mapped onto the brain, thereby using that understanding to conflate the concepts of neural integration and psychological integration. The focus on attachment and the brain seemed to be an attempt at social or relational theory but was at best an understanding of self as emerging in a dyad or triad with parents, validated by a materialized interpretation of intrapsychic processes rather than expanded with a broader understanding of the fluidity between a broader cultural context and the private family unit.

The existence and definition of self. In this section I examine how Cozolino defined or described the concept of self (aside from the relationship between self and mind or self and brain).

Influenced by D.W. Winnicott, Cozolino described self as developing during periods in childhood marked by calmness and being alone. Cozolino linked Winnicott's true self—false self dichotomy with secure and insecure attachment styles and general psychological wellbeing. This was the primary psychological theory of self that Cozolino used to link his interpretation of brain research with human psychological development. Cozolino applied the Winnicottian theory to describe self in a way that emphasized the need for children to develop a sense of independence from parents. He associated true self with optimal emotional wellbeing and false self with maladaptive dependency on the needs of others resulting from parents having failed to provide adequate personal space for the development of individual identity and the ability to understand and care for oneself. He implied that “self-reflective capacity” (p. 192) or the ability to be alone and contemplative is a central gauge of proper child development and psychological health or stability. Later in this section I discuss how Cozolino used Winnicottian theory as an interpretation of ideal brain development.

Self formed through narrative. Cozolino argued that self is closely linked to narrative, that is, the language or story that a person uses to describe oneself, especially in regards to personal history. According to Cozolino, since language can be used in a flexible or creative way, the flexibility or adaptability of human beings stems from the vastness of possible narratives that individuals can construct. Cozolino suggested a transcendent quality that narrative confers upon humans by describing it as the tool by which a person can imagine alternate ways of being before attempting to implement changes that are consciously desired. Cozolino also asserted that shared narratives link individuals within a society. His statement that narratives link “feelings, actions, and

others to the self” (p. 207) implied that feelings, actions, and other people are not inherent to or inseparable from selfhood, but instead are detachable from the autonomous individual. Cozolino’s ambitious use of narrative to depict humans as capable of grand and imaginative changes seemed to be an example of what Cushman and Gilford (1999) described as a misuse of interpretive or postmodern concepts by some recent psychotherapy theories that inadvertently promote the idea of imagining quick and unproblematic personal changes, consistent with consumer culture rather than the critical philosophies that such rhetoric might at first appear to suggest. Later in this section I discuss how Cozolino emphasized how narrative activates neuroplasticity and creates lasting neural change.

Narrative or “stories of the self” enables affect regulation. In one statement Cozolino argued that the consistency of memory about personal history is essential for emotional regulation. He suggested that individuals regulate their affect through the use of narrative because narratives engender a sense of stability and predictability.

Self and imagination. Cozolino linked the flexibility of self to the capacity for a flexible and creative use of language and to the human imagination that this use of language supports. He also emphasized how the capacity for imagination is facilitated by the highly evolved human brain (see *The relationship between self and brain*, pp. 143-151). As I discussed above with Cozolino’s description of the close association between self and narrative, the assertion that subjectivity may so radically and whimsically shift has been identified as a misuse of postmodern theories of self that often encourages a decontextualized understanding of identity, moral relativism, and logical contradictions (see Cushman & Gilford, 1999).

Overall, these various understandings and depictions of self suggested a combination of early-20th century psychoanalytic theory (which held a vision of self was rooted in an interiorized and individualized personhood) with highly relativistic portrayals of selfhood as easily and quickly changed based on imagination and narrative. Of note, his uses of the concept of self implied a unitary rather than multiplistic vision of self, as his understanding of integration and dissociation focused on various aspects of individual human functioning (e.g., psychological and physiological) rather than integration of multiple self states.

The existence and definition of mind. In this section I examine ways in which Cozolino defined or described the concept of mind.

Mind is how Freud chose to describe the brain. Cozolino did not explicitly define mind, although he intermittently described certain qualities or processes of the human mind and the relationship between mind and brain (see below). Cozolino used his simplified and ahistorical depiction of psychoanalysis as originating from neurology to imply that the psychoanalytic theory of mind was used as a placeholder until recent neuroimaging could establish the brain-behavior relationships that Freud initially and correctly hypothesized. In other words, he used his origin myth of psychotherapy to argue that human psychology and subjective experience appears nonmaterial but are now objectively verifiable by brain science as products of physiological correlates.

The brain is what therapists have unknowingly been working with or describing while calling it mind. As I discussed above (see *General history of psychotherapy according to Cozolino*, pp. 112-117), Cozolino argued that in conducting psychotherapy therapists have always been performing an intervention on the human brain. His

statements exemplified how he combined the psychoanalytic concepts of conscious and unconscious mind with the unique functions of the hemispheres of the brain. This implied that the tenets of psychoanalytic theory (there are both conscious and unconscious aspects of human experience and volition) and the interplay between the left and right hemispheres of the human brain are two ways of describing the same phenomena of human experience. Cozolino's rhetorical strategy overlooked the unique histories of brain research and psychoanalytic theory and therefore overlooked the unique goals, uses, and purposes of those areas of study. This dismissed the important cultural and political fit between psychological theories or treatments and the Western philosophical traditions from which they have drawn, as well as the specific cultural circumstances embodied by psychological theories. However, Cozolino also needed to insert a great deal of speculative and ambiguous language when drawing conclusions about the relationship between mind and brain (see *Ambiguity*, pp. 171-178; see *Speculation language*, pp. 195-203), and at times he acknowledged that such arguments are not without controversy and are potentially incapable of being considered objective findings rather than interpretive claims (see *Aporia*, pp. 178-182).

In sum, Cozolino's descriptions of mind depicted the study of human conscious experience as an antiquated concept aside from its relationship to the brain and the interpretation of mind or consciousness as the experience produced by neurobiology. He used his origin myth strategy to assert that human experience is the result of material or physical processes in the brain. This is a controversial position rejected by many experts even within the field of neuroscience (see Bennett & Hacker, 2003; Brothers, 2001; Noë, 2009).

The relationship between mind and brain. In this section I examine ways in which Cozolino explicated or implied a relationship between mind and brain.

Mind and brain are “a unified process.” Although Cozolino claimed to reject the reduction of mind to brain, in the opening statement of his book he posited a unity between the workings of the physical brain and the concept of mind. In that passage he argued that mind-brain research has been stifled by interdisciplinary politics, and that the complexity of these issues have turned many people away from trying to understand them. These claims were surprising in light of research documenting the popular appeal and academic prevalence of neuroscience research. Regardless, he responded by asserting that mind and brain are “essentially a unified process,” (p. 1) quickly simplifying the issue as if to assuage concerns that the mind-brain integration in his book might be complicated. The meaning of that statement was unclear, and portraying the issue as a matter of whether therapists can understand neuroscience seemed is a distraction from broader issues such as the accuracy of his mind-brain synthesis, and more importantly, the relevance of that theory for psychotherapy practice.

Mind is “embedded” within processes of the brain. Cozolino posited that psychoanalytic theories have unknowingly described brain functioning and how mind is “embedded” (p. 196) in brain processes. It was unclear what he actually intended to assert with that statement. However, by suggesting that psychoanalytic theories are necessary for understanding the relationship between mind and brain, or that those theories correctly describe how human experience results from neural functioning, Cozolino seemed to employ a fallacy described by Bennett and Hacker (2003) that states that one cannot ascribe such psychological theories to the brain unless one was already seeking to

find them, as there is no way to elicit from the brain a verification of whether the psychological theory or principle correctly fits with its functioning. The use of psychoanalytic theory in this way also seems to exemplify Brothers' (2001) argument that the field of neuroscience needs the field of psychology a great deal more than the field of psychology needs the field of neuroscience since neuroscience requires the use of established theories of mind to use as a vehicle for inserting its language into common parlance.

Mind might emerge from the brain. In one statement Cozolino speculated that mind might emerge from the brain (p. 132) but it was unclear whether he attempted to imply that current research supports that claim, or that future research will likely provide evidence in support of this finding. The use of the concept of mind and the intended claim about it were both vague.

Certain states of mind might influence brain functioning. In one passage Cozolino seemed to describe mind as conscious volition and he implied that it activates the brain in ways that result in greater control over thoughts and behaviors. Although Cozolino primarily used the concept of self and descriptions of brain functioning (rather than descriptions of mind), here he implied that human intentionality or deliberately cultivating a certain "state of mind" (p. 169) may influence brain functioning in a way that fosters the type of self-control over emotions that is consciously desired. If Cozolino intended to imply that mind and brain are not synonymous because states of mind impact the functioning of the brain, then the reader may conclude from that passage whatever is typically described as mind exists at least partially outside of the workings of the material brain. However, since Cozolino also explicitly argued that the human brain creates and

exerts tremendous influence over the perception of reality, it was not clear whether he would contend that human intentionality as depicted in this passage is merely part of the illusion of freedom or control produced by the brain (see also *Aporia*, pp. 178-182). Cozolino did not discuss the possible contradictions, or the important implications, that necessary follow from his phrasing.

Phrases that suggested mind and brain are not synonymous. In addition to the passage described above that could imply that mind and brain are not synonymous or identical, other passages contained descriptions of mind that implied a separation between mind and brain. However, Cozolino did not provide sufficient clarification about these phrases or elaborate on the implications of these statements. Although these passages implied possible distinctions between mind and brain, this type of rhetoric was infrequent in Cozolino's book, and in the absence of any explicit definition of mind it was not clear whether these passages were intended to refer to mind as human cognition and intentionality broadly, or to some possibly nonmaterial entity with which individuals are endowed. For example, in one passage he stated that over the course of human history, some executive functions "were assumed by the mind" (p. 115), suggesting that mind as at least partially separate from the brain. In another passage, the use of the phrase "group mind" (p. 164) implied that some process or entity is shared amongst people and related somehow to human social interactions. In another passage, his assertion that "brain and mind have evolved" (p. 316) to allow for the physical and emotional experiences of threatening situations also suggested a distinction between the two concepts or entities. However, he did not elaborate upon the intended meanings of these phrases.

Cozolino's failure to provide a clear definition of mind caused his occasional use of the concept to seem colloquial, and his intended assertions in these passages were vague. Because his use of the concept of mind alongside descriptions of the brain resulted in confusing statements, the intended relationship between mind and brain would seemingly have to be inferred by the reader. This might unknowingly reduce the concept of mind to brain functioning. In so doing, readers might unintentionally dismiss the relevance of psychological concepts and experiences apart from their verifiable neural correlates. Rather than simply overcoming a mental-physical dichotomy, this use of grammar could negate the importance of subjectivity and agency associated with psychological descriptions that inherently assume mental-physical holism and are thought to mediate brain-behavior relations (see Brothers, 2001).

The relationship between self and brain. In this section I discuss ways in which Cozolino explicated and/or implied a relationship between self and brain.

The extent of neural integration corresponds to the extent of psychological integration or coherence of self. Cozolino described how neural integration enables a seamless assimilation or coordination amongst various physical and mental aspects of human functioning. He seemed to associate that seamless coordination of human functions with the concept of selfhood or coherent psychological experience. In other words, he equated neural integration with a coherent experience of self in order to imply that self emerges from neurobiology. In one passage he first asserted that neural integration leads to what has been described by psychoanalytic theory as ego, and then he defined ego as the amalgamation of the psychological qualities associated with self ("personality, affect regulation, coping styles, and self image"; p. 27). In another passage,

based on his understanding of psychopathology as a lack of neural integration, Cozolino stated that it is a “fact that the self is a fragile construction of the brain” (p. 286). In that same passage he stated that the experience and location of self is flexible “within our imagination” (p. 286), a claim I discussed earlier when examining Cozolino’s understanding of self. These passages all demonstrated how Cozolino’s understanding of the relationship between self and brain at times had to be inferred based on the recurring ways in which it was used. Regardless, his uses of the concept of self alongside descriptions of the brain implied a decontextualized, material, and individual selfhood localized in the brain, and by happenstance or intuition had been described correctly by psychoanalytic and other psychological theories. His individualized vision of self was at once a physicalized self that can also utilize the properties of the brain to imagine boundlessness and freedom from apparent limitations, in order to facilitate desired personal changes.

Left and right hemispheres of the brain correspond to distinct aspects of self.

Cozolino emphasized how two remarkably specialized hemispheres of the brain are each responsible for different aspects of human perception and experience, and that the integration or coordination between the two regions is essential for a coherent experience of self. In the passages I identified, Cozolino mapped aspects of the psychoanalytic theory of mind onto the left and right hemispheres of the human brain. He asserted that the right hemisphere of the brain operates in a way that is similar to how psychoanalytic theorists describe the unconscious mind, while describing “the *left hemisphere interpreter*” (p. 103) as the process by which a person’s brain knowingly and decidedly chooses how he or she will form coherent perceptions, and then directs or portrays that

person to other people. Cozolino then speculated that this function of the left hemisphere is a possible explanation for psychological defense mechanisms as described by psychoanalytic theory. The use of left and right brain hemispheres to describe the localization (and ideally a balance) of distinct aspects of human beings highlighted Cozolino's use of the brain to support a veiled moral discourse whose origins were attributed (and reduced) to brain structures rather than shared culture and historical traditions that hold certain values and lifestyles in high esteem. For instance, by attributing rational self-control to the left hemisphere and unbridled mental processes to the right hemisphere, Cozolino naturalized a modern Western view of personhood that results in what is typically understood to be an indicator of adequate social functioning and general wellbeing. In other words, there are moral consequences to recommendations that are disguised as objective or neutral scientific findings.

The parietal lobes of the brain contribute significantly to the experience of self.

Cozolino argued that the parietal lobes have been overlooked as a likely significant contributor to the experience of self. The passages in this section exemplified the underlying logic that Cozolino used throughout his book to link human psychology or conscious experience with processes in the brain. Cozolino first described certain human characteristics or abilities that he identified as most defining of self (and accurately intuited by early psychoanalytic theorists) and then he localized those defining capacities of self in the brain (especially the parietal lobes). He thereby implied that self emerges from the brain and that early psychoanalytic theories happened to be correct in describing the experience of self that the brain enables. As I discussed above, the circular logic used

to attribute a theory of self or mind to the functioning of the brain warrants exploration in light of challenges to this logic by scientists and other theorists.

Winnicott's concept of true self describes neural integration and healthy psychological development. As I discussed above (see *The existence and definition of self*, pp. 135-138), Cozolino endorsed a Winnicottian vision of the emergence and development of self. He then used this theory to describe the results of brain development by speculating that the way in which an individual develops a self mirrors the way in which his or her brain develops, and that this brain development reflects the “neural organization” (p. 146) transmitted from parents to their children. With an attitude of certainty Cozolino described the true self as “obviously” (p. 191) a description of self that emerges from optimal development of neural networks. He described the concept of a true self as one that is psychologically integrated or conscious of and able to cope with negative feelings, and that the true self reflects proper mind-body integration. This is a depiction of self as an individual material being whose specific neurobiology (and therefore his or her mental or nonmaterial life) is formed primarily within the dyad or triad of parent-child relationships and is identical to a Winnicottian developmental scheme. This claim relied on the use of a psychological theory in a way that extracted it from the cultural circumstance in which that theory emerged and gained favor, and portrayed it as originally based on the intuition of the theorist who devised it, in order to re-appropriate it for use in the current era as verification of how brain science correctly explains the material origins of self.

Self and contemporary problems of the self both result from how the brain evolved to allow for imagination. Cozolino argued that the cerebral cortex of the brain

allows for the remarkable mental abilities that are unique to humans, such as the ability to imagine oneself in alternative circumstances, or to care about one's place in a complex social order. He argued that the human imagination is also the cause of psychological problems that stem from unrealistic fears and expectations. According to Cozolino, because the human brain has advanced with the evolution of the human species, feelings such as fear and worry, which originally were useful to ensure physical survival, are now experienced as a result of concerns about psychological integrity that are often unfounded or irrational. For example, he identified the human brain as implicated even in symptoms such as malaise or worry resulting from a consideration of issues such as the finitude of human existence, negative social standing, or catastrophes that are unlikely to happen. Above I discussed some of the problems with reducing and naturalizing all psychological experiences to material processes (see *General reasons why people seek psychotherapy*, pp. 129-132).

The ways in which the brain interprets social interactions contributes to a sense of self. Cozolino described how the human brain recognizes and interprets nuances during interpersonal communication. He suggested that social aspects of selfhood result from “automatic” (p. 189) brain processes. He implied that social reciprocity and shared customs or ways of living are possible to the extent that the human brain receives input from other people through circuits that synthesize this input and infer what other people might be experiencing. This brain-to-brain explanation for human society is a highly individualized and scientized depiction of human beings as inherently removed from ideas about a shared world based on a moral tradition, that is, a shared understanding of the good. In other words, his strategy for challenging modern isolated individualism

exemplified a technical understanding of selfhood that could ultimately reinforce individualism rather than adequately support social or relational visions of human being.

Neural integration enables self to be experienced as embodied. In at least two statements Cozolino used neural integration to explain the human experience of physicality. Cozolino depicted the connection between mind and body as occurring through an integration of networks in the brain. This seemed to be an attempt to use neuroscience to resolve the problems raised by the presupposition of doubt about physical existence underlying the mind-body dualism central to modern era philosophy. This use of brain research to link mind and body is problematic because it relies on materializing rather than contextualizing human psychology, thereby replicating the interiorized modern era vision of self it sought to rectify. Some psychotherapy theorists have applied late-20th century sociocultural theories such as philosophical hermeneutics to psychotherapy theories and practices that have addressed Cartesian dualism by rejecting as a central concern the efforts to prove the existence of a material self, thereby contextualizing therapy practice as a social and relational endeavor rather than inadvertently reinforcing the interiorized and intrapsychic modern view of self (Kirschner & Martin, 2010). Naturalizing the material view of self as a product of brain functioning dismisses interpretations of embodied selfhood as a cultural and historical viewpoint rather than a timeless truth regardless of the extent to which the idea of a physicalized individual self currently appears to be intrinsic.

Language and narrative foster neural integration, thereby enabling a coherent experience of self. As I noted above (see *The existence and definition of self*,

pp. 135-138), Cozolino identified narrative or language as essential for the formation and ongoing flexibility of self. He also posited that narrative facilitates neural network integration that corresponds to the experience of self and emotional regulation. In doing so he implied a correlation but not any specific directionality between psychological and neurobiological processes. In other words, it was unclear whether neural integration results from or produces the psychological experiences of emotional regulation and a sense of self. His emphasis on the role of language and narrative or discourse in the construction of self or the understanding of human beings seems to incorporate late-20th century social and interpretive theory (such as hermeneutics) that have been influential to contemporary psychotherapy theories. However, the idea that language joins people by connecting brains seems to be an attempt to use relational thinking in the service of reinforcing a materialized intrapsychic view of self.

Self-reflection facilitates neural integration. As I discussed above, Cozolino argued that deep and calm personal reflection is essential for the emergence and development of a coherent experience of self (see *The existence and definition of self*, pp. 135-138). Cozolino also suggested a fit between this kind of reflection or contemplation and neural integration. He argued that the development of an integrated brain and an integrated self are dependent upon self-reflection, which facilitates coordination between emotions, thoughts, and other aspects of human functioning. This was an example of assigning qualities to the brain that he had also assigned to the self, thereby linking self and brain using a rhetorical device rather than verifiable neuroscientific findings. This argument illustrated how Cozolino's view of self-contained individualism as both emerging from and facilitating healthy brain development was a

vision of acquiring self-control through a process of regaining power from the influence of the brain that seemed more akin to early modern era philosophy than contemporary interpretive understandings of human selfhood.

Narratives foster neural integration which enables affect regulation. Cozolino asserted that the way in which a person reflects upon his or her life can facilitate affect regulation or conscious control over mood and emotion. He also speculated that narratives about personal history serve to “maximize” (p. 47) neural integration because this fusion of memory and narrative supports affect regulation and predictable psychological functioning. This use of memory as a link between psychotherapy and the brain was an example of how Cozolino selected psychological theories and then explained them as the products of brain functioning, effectively naturalizing a philosophical discourse that has been seminal to the modern understanding of self in the west.

The array of uses of the concept of self alongside interpretations of brain functioning showed Cozolino’s emphasis on the relationship between self and brain. His statements implied that the concept of self was intended to describe the coherence of conscious experience through the integration of physical and psychological aspects of functioning. He mapped that understanding of self onto the brain by describing a relationship between neural integration and coherent or healthy psychological functioning. This served to individualize and naturalize the concept of self, portraying human beings as defined by the consistency of individual experience as allotted by and processed through the brain. This inner view of self seemed contrary to contextual or relational understandings of selfhood. Therefore the mapping of self onto brain seems to

perpetuate a view of human beings that is reminiscent of Cartesian dualism and early modern philosophy yet does little to foster an understanding of why these arguments might seem appealing or even necessary for psychotherapy theory and practice.

The relationship between self, mind, and brain. In this section I examine how Cozolino explained the relationship between self, mind, and brain by analyzing passages in which all three of those concepts or entities were discussed.

Exemplary of his self-mind-brain integration was Cozolino's depiction of the relationship between the right hemisphere of the brain, the "unconscious" mind, and physical and emotional aspects of self. Cozolino did not define mind and he seemed to focus primarily on the relationship between self and brain rather than the relationship between all three concepts. In one exemplary passage (see Appendix A, p. 311) he included direct reference to mind, self, and brain. It was a good illustration of how Cozolino depicted the human brain as the interpreter of context and the source of self, while using the concept of mind primarily to illustrate how certain aspects of human experience that have typically been discussed in psychological theories (such as the unconscious in psychoanalytic theory) are actually localized in the brain. In that passage mind was portrayed as an antiquated term, as Cozolino used the phrase "the unconscious mind" (p. 97) to refer to how one region of the human brain exerts control over perception and judgment and connects emotions and physicality to the experience of self. This passage fit with Cozolino's general strategy of focusing on the brain alongside descriptions of human experience while requiring that readers infer arguments about the relationship between mind and self through his portrayals of those concepts. This ultimately seemed to perpetuate a reductionist view of human being that not only failed to

account for the historical and philosophical differences between the study of mind and the study of brain, but served to promote a discourse about humans based on fusing neurobiological terms with human experiences and dismissing the use of mind as a concept that is central to valuing subjective conscious experience. In other words, this passage exemplifies the type of cognitive neuroscience discourse that Tallis (2004) cautioned could be challenge to the existence of psychology.

Neurobiological mechanisms of effective psychotherapy. In this section I identify some of the neurobiological mechanisms of effective psychotherapy that Cozolino discussed throughout his book.

The ability to alter gene expression. According to Cozolino, experience-dependent gene expression explains neural plasticity or how the structures and functions of the human brain develop based on the qualities of the early childhood environment and retain malleability which enables neurobiological and psychological change during later interpersonal relationships or experiences such as psychotherapy (see also *Neural plasticity*, below). Cozolino explained that the adaptability of the human brain in response to context is possible because the way in which certain genes are expressed is not predetermined, but instead emerge based on context and experience. According to Cozolino psychotherapy can “reprogram” (p. 65) or alter certain brain structures in order to create or restore health because the brain adapts to social and physical environments. This underlying argument for human selfhood and change showed a genomic understanding of human beings while offering hope for proving the existence of human agency and self-directness through confirmatory neuroscience research. This fits with a biomedicalized understanding of self I discussed in Chapter I.

Neural plasticity. The adaptability or plasticity of the human brain was central to Cozolino's explanation for the effectiveness of psychotherapy. According to Cozolino, human change is a process of learning and adaptation enabled by neural plasticity or the capacity of neurons to connect, expand, and form in accordance with human experience. This premise connected individuals to their broader contexts through brain functioning, thereby naturalizing the moral discourse of change, improvement, adaptability, and psychological healing.

Neural integration. According to Cozolino, successful psychotherapy or psychological healing corresponds with neural integration or newly formed connectivity within the brain. He provided examples of neural integration including integration between left and right hemispheres, enhancing executive functions, and inhibiting the activity of the amygdala. These passages (see Appendix A, pp. 312-313) highlighted Cozolino's use of neuroscience as evidence for a common factors approach to psychotherapy integration, that is, an understanding of the curative elements shared across various psychotherapies that are well established as effective psychological treatments. In these passages he described all successful psychotherapies as facilitating neural integration in the brains of therapy patients. Elsewhere he described how neural integration is fostered by each of the established common factors central to his psychotherapy integration (see *Psychological mechanisms that enable neurobiological mechanisms of effective therapy to occur*, pp. 155-157). He furthermore listed psychological symptoms and broad categories of abnormal behavior that have been "linked to deficits" (p. 106) in integration between the left and right hemispheres of the brain. With that claim, Cozolino did not specify whether deficits in neural integration are

believed to cause, result from, or simply co-occur with these psychological symptoms. In one passage he explained that a formerly narrow localized understanding of executive functions has been replaced by an understanding that brain functioning is best understood as integration between its many processes and regions. As an example of this he described how brain research validates an understanding of emotions and rational decision-making as not entirely separable from each other. This seemed to be a slightly updated localization theory that is only slightly less decontextualized.

New learning alters the effects of memories on psychological functioning or subjective experience. Cozolino suggested that memories are “encoded” (p. 16) or stored in the brain, and psychotherapy often alleviates symptoms or distress by reducing the impact of distressing or traumatic memories on later subjective experience. Cozolino used this link between memory and psychotherapy as evidence for why psychotherapy is a brain-based intervention. His statements were noteworthy because he specified a direct relationship between the brain and conscious experience. He identified neural firing patterns as first “sculpted by experience” (p. 16) before they are able to produce “organized patterns of behavior and experience” (p. 16), thereby positing directionality between mind and brain instead of simply providing a nonspecific description of correlation. With these passages Cozolino described the process of modifying patients’ reactions to memories as an essential psychological mechanism by which psychotherapy may be effective in reducing distress and changing the functioning of a patient’s brain. In one noteworthy passage, after stating that the flexibility of memory is “an observable manifestation” (p. 89) of neural plasticity because memory is encoded within or between neurons, he used this as evidence that psychotherapy is a direct intervention on the

human brain. These passages suggested an effort to depict individuals and personal history as tangible and manifested in an observable form, thereby verifying nonmaterial existence and explaining how it is physically alterable. These passages promulgated a view of human beings as configured through a neurobiological selfhood and connected to their broader environments and other people through the organ of the brain that functions outside of conscious control yet may respond to human volition in a way that enables human agency.

Psychological mechanisms that enable neurobiological mechanisms of effective therapy to occur. In this section I survey the broadest aspects of psychological experience that Cozolino claimed directly activate the neurobiological mechanisms I discussed in the previous section. Specific therapy interventions and other recommendations seemed to emerge from these broad psychological mechanisms, and I discuss those in the next section.

Four general conditions common to successful psychotherapies. Cozolino argued that four common factors—safety and trust in the therapy relationship, appropriate amounts of stress, the use of both emotion and cognition, and creating new narratives—are required for psychotherapy to be effective. He stated that neural change and integration is the marker of success for every psychotherapy, and he then asserted that neural integration is “enhanced” (p. 25) by these four psychological mechanisms. The purpose of therapy was therefore depicted through descriptions of processes that alter neurobiological mechanisms.

Language and narrative. Above I discussed how Cozolino identified language and narrative as defining features of self, and he described how these human abilities

provide a link between the experience of self and the functioning of the brain. Cozolino also identified narrative and specific types of narrative or uses of language as significant for psychotherapy and neural integration. He portrayed narrative as a primary means by which therapists collaborate with patients in order to assist them with developing new thoughts and behaviors, and he depicted narrative as a primary psychological mechanism by which neural integration is activated. These statements were significant because he described narrative as the means by which whatever was previously unconscious or outside of a patient's awareness becomes conscious and leads to changes in self.

According to Cozolino, narrative leads to increases in self-reflection and self-awareness.

He argued that this process may allow patients to appraise thoughts in ways that expand choice and separate themselves from social expectations or expectations of other people that might previously have appeared inflexible and prevented greater self-directedness.

According to Cozolino, self-reflective language integrates thoughts and emotions in a way that may eventually foster a depth of understanding that facilitates a meditative state, that is, a higher level of consciousness wherein a patient can "move beyond words"

(p. 171). It was unclear what that phrase meant but it seemed to imply some feeling or experience of transcendence. In this way narrative was portrayed as a mechanized tool that alters the brain and makes changes to psychological functioning that are potentially permanent. This was a technicized and reductionist use of the concept of narrative.

Create a nurturing and supportive therapeutic relationship that facilitates secure attachment. Cozolino argued that the therapy relationship itself guides gene expression in a healthful way that confers psychological change, thereby positioning this relationship as an instrument capable of activating the neurophysiological processes he identified as

necessary for psychological change. This focus on the therapy relationship might appear to challenge technicized ways of conducting therapy. However, it may instead perpetuate instrumentalism or a technicized understanding of therapy practices by appealing to the possible effects of human interconnectedness on the brain. This seems contrary to an understanding that the relationship itself is a way of understanding human psychology beyond the internalized physical effects to which interpersonal experiences are allegedly reducible.

An appropriate amount of stress helps patients learn to regulate their own affect.

Cozolino described successful psychotherapy as requiring a balance between challenging and supporting patients in order to establish an ideal setting for new learning and affect regulation. Cozolino mapped the combination of supportive and challenging conditions in therapy onto the human brain. He described this process as activating neural processing and allowing a patient to internalize the stability of a therapist, sharing the therapist's capacity for self-regulation while the patient works to develop those abilities in order to use them independent of the assistance of others. This was an example of a brain-to-brain depiction of affect regulation and social selfhood.

Overall, these psychological principles were technicized as conditions that activate desired brain changes believed to be the underlying mechanisms of psychological change rather than unique or important experiences or ways of knowing that are separate from the physical correlates of the psychological and interpersonal processes.

How therapists should provide psychotherapy. In this section I highlight some of the specific psychotherapy interventions that Cozolino recommended.

Common interventions across established psychotherapy models that stimulate neuroplasticity. In two exemplary passages (see Appendix A, pp. 316-317) Cozolino listed examples of psychotherapy interventions. These lists present very brief and general descriptions of a variety of typical therapy interventions. He argued that these therapy strategies or techniques all stimulate patients' brains in ways that lead to neural integration. This was an example of a casual appeal to neuroscience as validation for therapy integration and the understanding amongst many therapists that over the course of therapy with any one patient, a therapist might incorporate a variety of strategies that at one point were traceable to specific paradigms yet now may be identified as part of a generalist psychotherapy approach. This reduced a psychotherapy trend that developed over many years (and which also has cultural, historical, and economic factors) to a simple explanation for the convergence of therapy interventions as an inevitable result of the functioning or needs of the brain.

Consider how the brain distorts thinking and listen for what is not being talked about. Cozolino argued that the brain generates and distorts each patient's perception of reality, and he recommended that therapists remember this and even inform patients about this in order to provide evidence that their difficulties may stem from beliefs that are inaccurate. He argued that conscious thoughts or mental processes are products of the "left hemisphere interpreter" (p. 111), that is, the function of the left hemisphere of the brain he described as actively choosing for an individual how he or she presents himself or herself to other people. Cozolino used this understanding of brain functioning to suggest that the process of identifying a patient's dissociated experiences leads to an integration of those experiences into consciousness, while also facilitating integration

between brain hemispheres. In other words, pairing psychotherapy concepts with brain regions allowed Cozolino to portray neural and psychological integration as simultaneous processes.

Attribute psychological symptoms to the brain or body in order to depathologize them and to engender a sense of control for patients. Cozolino suggested that therapists might build rapport and engender a sense of egalitarianism in the therapy relationship by discussing how they share with patients the same potential for imperfections or difficulties because they are also endowed, as all humans are, with a brain that distorts reality. In this way patients might see difficulties and challenges as common occurrences and feel relief after recognizing that their troubling experiences are not unique. Although this recommendation was mentioned infrequently, it is significant to note because it showed how Cozolino recommended directly incorporating a discussion of brain research into the psychotherapy discourse, therefore illustrating the claims about self-perpetuated by a therapy discussion about the brain in accordance with his recommendation.

Identify the congruence between a patient's cognition and affect. Cozolino suggested that recognizing the fit between a patient's thoughts and feelings is a way to identify the extent of that patient's neural integration. He attributed the capacity for conscious narrative to the left hemisphere of the brain and he attributed nonverbal communication or affect to the right hemisphere, thereby portraying the effort to facilitate congruence between thought and affect as an exercise in brain hemisphere integration. This is an example of mapping onto the brain a cultural narrative or moral discourse that describes a balanced or self-controlled manner in which a person should interact with other people and live and work effectively. In other words, Cozolino appealed to a

fascination with the brain to naturalize an understanding of modern social norms and the good.

Using narratives in a way that puts feelings into words and engenders emotional regulation and a sense of control. Cozolino argued that accurately identifying feelings and consciously rewriting stories about personal history builds self-efficacy, and enables desired changes and healing in psychotherapy. He suggested helping patients as they create narratives that contain a more “objective” (p. 161) understanding of whatever issues are being discussed. These passages were noteworthy for how Cozolino depicted the brain as creating a flexible self and the ability to change in accordance with personal goals or aspirations (suggesting a subjective interpretation of reality), while paradoxically also providing an objectively verifiable neural location of those attributes. This appeal to a belief in the objectivity of science to validate human subjectivity in a highly reductive and technicized way seemed to fit with the dichotomy between inner subjectivity and external material reality that was central to early modern philosophy.

Make interpretations, analyze projection, and discuss whatever is dissociated or not being talked about. Some of Cozolino’s therapy recommendations drew from a psychoanalytic approach re-envisioned as a brain intervention. In one passage Cozolino asserted that patients reorganize their brains through becoming aware of unconscious experiences that result from the functioning of “hidden layers” (p. 138) in the brain that distort the perception of reality and lead to biases and irrational ways of thinking. Cozolino described typical changes in affect when a patient is confronted with unconscious or dissociated aspects of his or her experience, thus beginning “to fully experience the emotions against which he or she was defending” (p. 295). In other words,

Cozolino highlighted interventions intended to expose thoughts that patients are defending against or avoiding, and he incorporated these therapeutic strategies into his brain-based therapy theory.

In general, with all of the passages advising therapist how to practice psychotherapy, broad and longstanding psychotherapy theories were first reduced to obvious technical interventions and then repurposed according to their brain-changing capabilities.

Indicators of successful psychotherapy outcomes. In this section I identify psychotherapy outcomes that Cozolino considered to be desirable and therefore indicative of therapy efficacy or success.

Neural integration. Although neural change is not observable without neuroimaging, the argument that neural plasticity allows therapy to activate the brain in ways that support neural integration was ubiquitous throughout Cozolino's book. As I noted earlier, Cozolino predicted that psychotherapy will begin to routinely include neuroimaging as a part of treatment planning, case conceptualization, and outcome assessment (see *Differences between Cozolino's theory and established psychotherapy theories*, pp. 121-127). He also acknowledged that neuroimaging studies of psychotherapy patients had not been conducted with patients seeking therapy for general life problems rather than diagnosable mental illness (see also *General reasons why people seek psychotherapy*, pp. 129-132). Cozolino therefore portrayed neuroscience as a source of objective proof of psychotherapy's efficacy and of the mechanisms through which therapy is beneficial, but he noted that for some patient populations this remains speculative.

Less dissociation or greater integration. Cozolino used the concepts of dissociation and integration in descriptions of both psychological and neurobiological processes. At times he seemed to depict psychological and neurobiological integration as concurrent processes, and at other times Cozolino implied a direct or causal relationship between neural integration and psychological integration or coherent human experience. For example, in one passage (see Appendix A, p. 322), Cozolino described the integration of psychological aspects of human functioning such as thoughts and behaviors as “an active neurobiological process” (Cozolino, p. 21). However, there he provided no direct evidence supporting that assertion or its implication that psychological experience emerges from human neurobiological processes. Cozolino’s use of the concept of integration across psychological and neuroscientific descriptions of functioning and wellbeing ultimately confused and conflated separate epistemologies or ways of understanding human beings.

Symptom reduction. Cozolino recognized that some theories identify the purpose of psychotherapy as an effort to reduce or alleviate specific psychological symptoms. He implied that this description of a successful therapy outcome is equal to other theories’ descriptions of the purpose of psychotherapy (such as differentiation or ego strength) because all of those are interpretations of the same neural change. In other words, he used this indicator of successful therapy to argue that therapy theories offer quite different interpretations of the same objective truth that brain research best articulates.

Affect regulation. According to Cozolino, affect regulation is closely tied to secure attachment and a cohesive sense of self (see *Secure attachment* below). In one statement he proposed that affect regulation is “the most important result” (p. 47) of

therapy because psychological integration (coherence amongst various mental and physical processes essential for mental health) is impossible without it.

Secure attachment. Cozolino described the psychotherapy relationship as activating the brain's innate drive for communication and social interaction in a way that helps patients develop a secure attachment style. Cozolino described secure attachment as synonymous with the ability to appropriately engage with other people in ways that help regulate emotions and exert conscious control over psychological and physiological reactivity.

Ego strength and higher-order defenses. Tenets of psychoanalytic or psychodynamic therapies were prominent in Cozolino's book, and in some passages Cozolino used psychoanalytic concepts to describe successful psychotherapy. For example, he described the quality and characteristics of an individual's functioning as dependent upon, or indicated by which defenses are used, rather than whether defenses are used, thereby implying that psychological defenses are indispensable in human life. In another passage, secure attachment and ego strength were combined as measures of psychological wellbeing that he described as coinciding with more adaptive psychological defenses (for passages, see Appendix A, p. 323).

Self-reflective language. According to Cozolino, self-reflective language is indicative of an increased capacity for self-awareness and understanding, and suggestive of positive changes in psychological functioning. Elsewhere in his book he described self-reflective language as an important indicator of healthy psychological development and the emergence of self, and he implied that therapy may serve as a corrective

intervention for patients whose parents or caregivers did not facilitate the development of this type of language during early childhood.

Earned autonomy and avoiding pathological caretaking of others. According to Cozolino, appropriate psychological separateness and boundaries with other people (especially family members) are indicative of psychological health. Further, these qualities would ideally have developed during childhood through parenting that adequately respected this developmental need. He described a lack of autonomy between a child and his or her parents as a cause of the tendency to form relationships later in life in which the emotional needs of others is placed above one's own emotional needs. The values of independence and self-directedness were essential to Cozolino's understanding of self or ideal development and functioning.

In sum, Cozolino supported a variety of ways to identify therapy success that represented the tenets of several psychotherapy theories and a variety of interpretations of mental health and wellbeing. This probably served to maintain a broad appeal for his text, and incorporating a variety of indicators of psychological functioning seemed to further repurpose a multitude of therapy theories as unknowingly describing the same underlying neuroscientific phenomena or material truth. This is also an explanation for the popularity of his work.

Case vignettes from Cozolino's psychotherapy practice. I located 13 case vignettes throughout Cozolino's book, nine of which described his outpatient psychotherapy treatment of individual adult patients (of note, one of those nine cases involved a patient whom Cozolino had treated for one month in a hospital setting with individual and group therapy, and it was unclear whether the patient attended more than

one outpatient therapy session because that case vignette was brief and it was used to explain symptoms of Capgras syndrome (a serious mental disorder) rather than a course of treatment). With the remaining four vignettes, one described psychotherapy with a child patient, one described psychological assessment and treatment recommendations with a child rather than psychotherapy, one depicted family therapy with an adult brain injury survivor that involved cognitive rehabilitation strategies such as education about head injuries and support during a transition to appropriate community services (such as vocational rehabilitation), and one described a single consultation session with a patient experiencing severe flashbacks of childhood trauma in which Cozolino unexpectedly performed a crisis intervention. The vignettes were dispersed throughout the book and ranged from approximately two to six pages in length, with almost all of them being less than three pages long. In this section I examine two of Cozolino's psychotherapy case vignettes. I provide the demographics of each patient and I outline the presenting problem and course of treatment that Cozolino described. The purpose of this section is to examine the ways in which these case vignettes illustrate some of his broader understandings about human psychology and recommendations for conceptualizing and treating psychological problems. I selected these vignettes because they were representative of some of his general understandings about self, illness, and change.

Sandy. Sandy, a patient in her mid-40s, sought treatment for "the usual concerns about relationships, family, and career" (p. 148). After some initial therapy sessions Cozolino realized that Sandy experienced intermittent depressive episodes characterized by irritability and feelings of hopelessness. He spent time trying to discover a possible genetic, medical, lifestyle, or developmental origin of these episodes, but he eventually

recognized a behavior cycle wherein Sandy's mood swings tended to precede recurring sinus infections. In an attempt to relieve Sandy's anxiety and feelings of self-doubt, and to help her create a narrative about the origins of her mood swings and practice behavioral changes to avert them, Cozolino attributed the mood swings to her pattern of physical symptoms.

We decided to anticipate her next dip in mood with a new plan. We agreed that she would stop evaluating her life on days that she lost her will to live. She was not allowed to think about leaving her husband or her job, or assess her worth as a person. Instead, the mood dip would be a cue for her to go to the health food store, buy vitamin C and zinc tablets, and rearrange her schedule to reduce stress. . . . Sandy had to remain mindful of the possibility that what she experienced as negative emotions was really a result of biological changes related to a physical illness and not a collapse of character or impending global catastrophe. We worked on developing a safe internal place for her to retreat to at these times, where she could soothe and comfort herself and focus on healing. Over time, the association between sinus infections and mood changes held up—we had created a new narrative with far more explanatory power than the one it replaced. For some unknown reason, Sandy's biochemistry reacted to infection with a sharp drop in mood, most likely related to drops in serotonin and dopamine. The psychological depression experienced as a result of these changes led her to reinterpret, in a negative way, the value of all aspects of her existence. By being mindful of this process and using her frontal and parietal executive functions to associate experiences with new meanings, she was able to engage in different behaviors and create a better outcome. We had converted what usually led to an existential crisis into a trigger for enhanced self-awareness, self-care, and medical management. Sandy needed to learn how to pay attention to her feelings, reflect on them with past experiences in mind, and follow a new plan of action contrary to old reflective patterns. (pp. 149-150)

Cozolino speculated that Sandy's depressive episodes were caused by neurochemical changes that accompanied sinus infections, and he also stated that this physiological explanation might not have been supported by established medical theory. With his case formulation he disregarded any psychological or psychosocial origin for his patient's depression, favoring instead whatever physiological explanation was plausible. He incorporated his preferred psychoanalytic theory of the emergence of self

(encouraging Sandy to develop “a safe internal place for her to retreat”) into a behavioral approach that focused on improvements in practical coping skills to reduce the occurrence of mood swings rather than helping Sandy understand the possible significance of her thoughts and emotions during depressive episodes. It was noteworthy that Cozolino discounted the possibility that Sandy’s thoughts and impulses during her depressive episodes might in fact be related to unmet needs, legitimate concerns, or difficulties with her family or other aspects of her life. Cozolino replaced psychological insight with information about how the interactions between neurobiological and other physical processes might cause symptoms of depression. His preferred explanation suggested that if physical processes can be identified as the cause of psychological symptoms, then the symptoms should be explained as such and treatment should proceed accordingly. His justification for this approach was that the narrative he created was helpful for explaining symptoms and providing implementable solutions.

Sheldon. Sheldon, a Holocaust survivor in his late 60s, sought treatment for “his many anxieties and fears” (p. 89). His family members perished during the genocide while he survived in hiding.

As a child, his parents had hidden him from the Nazis in a storage room behind the home of family friends. . . . Describing these days, Sheldon recalled alternating states of terror and boredom, during which he would either sit and rock or ride his tricycle around in slow tight circles. . . . 60 years later, he still found himself reflexively rocking or walking in small slow circles when he became frightened. His life felt like one long, fear-filled day. (pp. 89-90)

Cozolino intervened by asking Sheldon to imagine that as a child he had been able to escape from his confinement on his tricycle rather than having ridden it in circles in the storage room where he was forced to hide during the war.

One day, I asked him for permission to change his memories just a bit. . . . I asked him, “What would you do if this was a magic tricycle and it could take you through walls without getting hurt?”. . . . Sheldon said, “I would ride right through the house and out onto the sidewalk”. . . . I felt that an imaginative task like this was not only accessible to him but would also serve the purpose of bridging the positive affect from his grandchildren to his lonely and frightened experiences as a child. Imagining he was making up the story for his grandchildren might also help him cope with the embarrassment of doing this with another adult. (p. 90)

Over the next few months, whenever Sheldon experienced his childhood fears and anxieties, we would revisit his story and modify different details. These changes seemed to grow more detailed and more vivid in his mind. His imagination gave him the power to master many of his past fears. . . . Sheldon was a very special man who was able to take advantage of the malleability of memory to make his inner world a safer place. Nothing had changed about his childhood except that now, when he remembered his hiding place, he also remembered his magic tricycle. (p. 91)

With his creative exercise Cozolino helped Sheldon practice coping with symptoms of trauma-related anxiety by pairing elements of the traumatic memories with an imagined escape from his forced hiding during childhood. Cozolino used this imaginative activity in order to illustrate how psychological reactions to anxiety-provoking memories are alterable because of the plasticity of the brain in which the memories are stored. This vignette was striking. In the description of his treatment of Sheldon’s psychological trauma Cozolino never discussed Sheldon’s experience as a member of a major religious group that was targeted for total eradication. Sheldon’s experience of trauma was described as a curable set of materialized symptoms rather than a part of his cultural heritage that may have been exacerbated by acculturation stressors during resettlement in the United States. Culturally sensitive and relevant psychotherapy for psychological trauma following ethnic persecution might have included a discussion of whether Sheldon sought sanctuary amidst his religious community in the United

States, and why he might or might not have experienced such religious and community involvement as helpful.

The two case vignettes discussed above were exemplary of some of the recurring therapy recommendations and general themes in Cozolino's book. In the first vignette, Cozolino alluded to his preferred psychoanalytic theory of the development of the self when suggesting that his patient, Sandy, needed to learn to cope with depression by spending time alone to develop a safe, "internal" place to turn to during stress. He placed that recommendation alongside behavioral changes that seemed to dismiss the importance of the patient using her difficulties with mood to learn about herself or to evaluate the context in which those symptoms emerged. His case conceptualization relied on a possible behavior cycle that Cozolino admitted might be tenuous, and his subsequent treatment approach dismissed any relational or depth-oriented course of therapy. With Cozolino's treatment of Sheldon, his creative role-play intervention decontextualized that patient's history of surviving genocide, reducing it from an experience shared by millions of people with the same religious history to isolated symptoms portrayed as curable by imagining a different personal history. His approach with both cases rested on a brain-based explanation for why creating a new way of thinking and talking about a situation can lead to a reduction in presenting symptoms.

Summary of primary content. In *The Neuroscience of Psychotherapy: Healing the Social Brain*, Cozolino (2010) used the origin myth that psychotherapy originated from neurology to portray his text as an inevitable return Freud's intended brain-based explanations of human psychological experience or mind now that neuroimaging technology has advanced quite remarkably. This suggested an attempt to argue that the

concept mind (especially as delineated in psychoanalytic theory) has been a historical placeholder for brain functioning rather than a culturally significant and very different understanding of human selfhood than the reductionist understanding of mind often associated with cognitive neuroscience. Cozolino described traditional therapy theories in terms of their proposed underlying neural correlates, and he stated that rather than an original psychotherapy theory, his text was intended as an integration of the common factors of the most well-known therapy theories based on the understanding that all effective therapies foster neural integration. Passages defining mind and self, and depicting a relationship between mind, self, and brain, were noteworthy for their generally unclear (and altogether infrequent) use of the concept of mind aside from the assertion that Freud's tripartite theory of mind can be thought to represent three parts of the human brain that have evolved over the course of human history. Although Cozolino's text incorporated a wide array of psychotherapy concepts, psychoanalytic concepts were especially represented in discussions of self, therapy interventions, and indicators of successful therapy outcomes, and those concepts were often mapped on the brain. For example, he described the experience of the self as the extent of neural integration. Cozolino's case vignettes often used descriptions of brain functioning to justify the efficacy of an assortment of talk therapy interventions. The vignettes I reviewed showed Cozolino's use of creative role-play exercises, as well as attributing psychological symptoms to physiological processes rather than a combination of personality characteristics and psychosocial stressors. Throughout my interpretations of passages related to these primary content categories, I noted ways in which Cozolino's

text was often reductionist and scientific, and based on ahistorical and materialized claims about human mind or self.

Rhetorical Strategies and Elements of Writing Style

In this section I provide examples of rhetorical strategies or devices in Cozolino's (2010) text. I primarily reference the *Oxford Dictionary of Literary Terms* (Baldick, 2008) in my descriptions of these devices and strategies.

Ambiguity. Ambiguity refers to statements that may be interpreted in two or more distinct ways, or statements for which the meaning in general was unclear. Examining ambiguous statements was important for revealing how Cozolino's rhetoric might have led readers to confuse or conflate separate concepts because he did not sufficiently differentiate them. Ambiguity in a mind-brain integration project is also significant because this rhetoric blurs psychology and neuroscience, thereby equating them through obscured sentence structure and word choice rather than clear supportive evidence.

Statements that were unclear about the directionality or relationship between mind and brain. In the following statements it was unclear whether Cozolino intended to portray mind or human volition as initiating changes in neurobiology, or if he intended to portray the brain as influencing or controlling human psychology.

“The ebb and flow of emotion over the course of therapy reflects the underlying neural rhythms of growth and change” (p. 46).

In this passage it was unclear whether “neural rhythms” cause changes in emotion or whether emotions and neural rhythms are co-occurring phenomena. In other words, Cozolino did not specify the relationship between the brain and human experience.

The following two passages also contained phrases that caused ambiguity about the relationship between mind and brain.

These processes of mind, which insecurely attached children often lack, reflect the utilization of narratives in the development of self and self-identity. They also point to a more sophisticated ability to metacognize (think about thinking), that represents a high level of neurolinguistic self-regulation. (p. 208)

“The popularity of this game reflects the development of these systems as well as a way to exercise voluntary control over impulses” (p. 130).

In these passages, the phrases “point to,” “represents,” and “reflects” were seemingly used to describe a relationship between mind and brain but the specific relationship or order between psychological and neurobiological processes was unclear.

In the passages above, readers are left to either assume the correct relationship between mind and brain, or to simply conflate the two processes if they appear to be simultaneous.

Statements in which it was unclear whether Cozolino intended to describe an animal or a human. Throughout his book, Cozolino described animal experiments for which findings were portrayed as relevant for human psychology and neuroscience. However, in some passages it was unclear whether he attempted to use those experiments to draw a conclusion about humans.

Mother rats lick, nurse, and retrieve their pups when they roll out of the nest. These three behaviors are easily observed and counted by willing undergraduates, and correlated with behavioral and biological variables in the brains of both mothers and children. (p. 217)

Here it was unclear whether “behavioral and biological variables in the brains of both mothers and children” was intended to refer to human mothers and children or rat mothers and children.

“Even virgin rats who are given pups to care for experience increased dendritic growth and neuronal excitation. . . . Thus, just as in children, interpersonal contact changes the brains of parents” (pp. 224-225).

Here it was unclear whether Cozolino intended to conclude that human children and parents or rat children and parents experience brain changes through interpersonal contact.

Because it was unclear whether the conclusions in those passages were intended to apply to animals or humans, it was unknowable whether Cozolino intended to infer, accurately explain, or speculate about the relevance of animal neurobiology to the understanding of human functioning.

Statements in which it was unclear whether Cozolino intended to describe humans or brains. These statements were noteworthy for ambiguity that might cause readers to conflate the concept of self or personhood with the brain.

Only through trial-and-error learning are early clumsy movements slowly shaped into functional skills. Children and their brains intuitively know this and will resist being held back or helped too much. When we attempt to help, a child’s impatient protest of “Let me do it!” reflects instinctual wisdom of the importance of trial and error learning in the growth of neural networks. (p. 69)

It was unclear whether “instinctual wisdom of the importance of trial and error learning in the growth of neural networks” was intended to imply that children possess instinctual wisdom about the brain’s need to have growth of neural networks, or, that instinctual wisdom is stored within neural networks and therefore activated by the growth of those networks. Further, if Cozolino’s intention was to describe instinctual wisdom of children, then it was unclear whether he posited that a child has innate wisdom from the brain about the way the brain needs to grow, or that a child has wisdom about how he or

she needs to grow, and therefore the growth of neural networks is simply spurred by the child's subsequent actions.

The exploration of human consciousness is a vast new frontier for neuroscience where there may always be more questions than answers. We know consciousness exists; we just have no idea of how it emerges from the functioning of the brain. An inherent challenge to this exploration will always be the conflict of interest involved when something is studying itself with all the bias and distortion that interferes with objective observation. There is no easy way around this. (p. 150)

The phrase "when something is studying itself" could imply that the brain is studying itself through directing humans to study it, or it might imply that humans are studying themselves through studying the brain.

Consider what we do when we assist clients in shifting their own perspective to looking at a situation from another point of view, to thinking about the situation once again from a more objective perspective. We are calling upon the ompfc and dlpc in different ways as we attempt to guide them to a more holistic perspective of a life situation. (p. 161)

It was unclear whether therapists "guide" clients or guide the two regions of the brain ("ompfc and dlpc").

An exaggerated reliance on intellectual defenses, overemotionality, or a negative attachment experience can become established as self-perpetuating patterns that lead to social isolation and underperformance. All of these suboptimal lifestyles are most likely reflected in biased patterns of neural activation, which become the focus of psychotherapy. (p. 163)

It was unclear whether "suboptimal lifestyles" or "biased patterns of neural activation" become the focus of psychotherapy.

"When verbal interactions include references to sensations, feelings, behaviors, and knowledge, they provide a medium through which the child's brain is able to integrate the various aspects of its experience in a coherent manner" (p. 207).

In that statement it was unclear whether the phrase “various aspects of its experience” was meant to imply various aspects of the child’s experience or various aspects of the brain’s experience.

Like the attachment system described earlier, the development of this engagement system and the fine-tuning of the vagal brake to regulate affect appear to depend on the quality of attachment relationships in early childhood. This allows us to internalize what we learn from experience with caretakers into moment-to-moment somatic regulation. (p. 234).

It is unclear whether the “development of this engagement system,” the “fine-tuning of the vagal brake to regulate affect,” the “quality of attachment relationships,” or some combination of all three enables individuals to “internalize” whatever is learned from experience.

Ambiguity in the passages above was noteworthy because readers may interpret the focus of psychotherapy as the brain rather than the patient, and neurobiological and psychological concepts may be read as interchangeable. This obfuscated the purpose of psychotherapy, as well as the differences between theories that typically have focused on explaining the concept of mind and those explaining the functioning of the brain. Further, a lack of clarity could create suggestibility about the relationship between mind and brain, and detract from readers considering how the everyday understanding that a person is integrated mentally and physically does not translate easily into integrating distinct psychological and neuroscientific methods of inquiry.

Analogy. An analogy is a comparison between two sets of phenomena that is based on a logical argument (rather than a figure of speech such as metaphor that compares unrelated objects or concepts based on a similar quality and often in an illustrative fashion; see p. 206 below). Cozolino used analogy to compare various human

endeavors or types of relationships, often by asserting that the same neurobiological processes underlie both relationships. The use of neuroscience as a tool for explaining the interdependence of valued social institutions was noteworthy for how it overlooked longstanding and shared cultural traditions that those institutions embody.

The theory that ontogeny recapitulates phylogeny refers to the concept that the evolution of the species is recreated in the gestation and development of each individual. To use Maclean's terms, we pass through the reptilian and paleomammalian stages before we develop into a fully human being. (p. 8)

In this passage Cozolino compared the evolution of the human species to the lifespan development of each individual on the basis that both processes manifest an incremental progression or maturing of the human brain. He implied that the phases of personal development are accelerated versions of the epochs in which humans gradually evolved from lower life forms to the dominant yet civilized species characteristic of its current form.

At the heart of the interface between neuroscience and psychotherapy is the fact that human experience is mediated via two interacting processes. The first is the expression of our evolutionary past via the organization, development, and functioning of the nervous system. . . . The second is the contemporary shaping of our neural architecture within the context of relationships. (p. 12)

In the passage above, Cozolino turned the analogy between evolution and lifespan development into the central component of his brain-based psychotherapy book. In the following passage he used analogy to compare brain and self.

We have equated psychological health with optimal neural network growth and integration. Both the brain and the self are built in a stepwise manner by experience. The nervous system is made up of millions of neurons while human experience is constructed within countless moments of learning. (p. 31)

In this passage Cozolino compared the relationship between the nervous system and neurons to the relationship between human experience and the single moments that

comprise it, on the basis that the nervous system and human experience are both very complex and constructed from large numbers of their smaller components. Cozolino did not propose a specific relationship between self and brain in this passage, and the strategy of analogy enabled him to use a comparison between human psychological and neurobiological development to portray a relationship between brain and self without specifying how the concepts are directly related.

Neuroscientists already possess the perfect model for understanding interdependency—the individual neuron. We know that neither the individual neuron nor the single human being exist in nature. Without mutually stimulating interactions, people and neurons wither and die. In neurons, this process is called apoptosis, while in humans, it is called anaclitic depression. (p. 179)

Here Cozolino compared the relationship between a person and a group of people to the relationship between a neuron and a group of neurons on the basis that both relationships imply interdependency among members or parts of a larger functioning group or system. Because the concepts are juxtaposed, readers might infer a relationship between neuron functioning and psychopathology even though Cozolino did not actually argue that cell death leads to depression. In the following passage Cozolino used analogy to compare psychotherapy to other relationships.

Relationships are our natural habitat, while the isolated brain is an abstract concept. Thus, understanding the brain requires knowledge of the person embedded within a community of others. Therapists, teachers, and parents intuitively grasp this profound reality just as laboratory scientists often do not. We are now in a position to help research scientists know where to look as they explore how the brain grows, learns, and changes throughout life. (p. 179)

This passage implied that therapists and patients, teachers and students, and parents and children are all comparable relationships insofar as each necessitates the person in the helping or leading role to understand the significance of interdependence or

community. The two sentences were noteworthy for how Cozolino seamlessly interchanged the concepts of “relationships,” “person,” and “brain” by first ascribing to human relationships the quality of naturalness and then criticizing the idea of an isolated brain instead of criticizing the idea of an isolated human. This may convey that people interact with the brains of other people, or that brains interact on behalf of people, or the passage may simply lead readers to assume synonymity or interchangeability between descriptions of people and descriptions of brains.

All of these analogies were significant because they portrayed relationships between humans and brains or might even have suggested direct arguments about mind and brain, yet the rhetorical device suggested that Cozolino linked self and brain through sentence structure and word choice in those passages rather than through a coherent philosophical argument.

Aporia. Aporia is an admission of doubt (in this case by an author) about the ability of a text to resolve a dilemma or answer a question that the text has raised. Examples of aporia were significant because they raised doubts about the usefulness of integrating mind-brain research into psychotherapy theory, or at least about the ways in which that research had been applied in Cozolino’s book. These were noteworthy not only for the implications of how Cozolino addressed possible contradictions or other flaws in his arguments, but also because he typically admitted little doubt about the importance of his efforts aside from these statements.

Because of the nature of neural processing, it might not be possible to ensure objectivity in the interpretation of brain research. Consistent with his argument that human psychology or experience arises from the functioning of an imperfect and biased

human brain, Cozolino acknowledged that this premise implies a glaring fallibility for any attempt to objectively interpret brain research.

The exploration of human consciousness is a vast new frontier for neuroscience where there may always be more questions than answers. We know consciousness exists; we just have no idea of how it emerges from the functioning of the brain. An inherent challenge to this exploration will always be the conflict of interest involved when something is studying itself with all the bias and distortion that interferes with objective observation. There is no easy way around this. (p. 150)

With this passage Cozolino acknowledged that by following his own argument that each individual's brain distorts his or her perceptions of reality, he must contend with the possibility that neuroscience research cannot be objective because it is a study of that organ and therefore subject to the "biases" and misperceptions that are among its defining qualities. Therefore it might be impossible to understand brain research in a way that is free of those factors. If humans cannot study the brain objectively, it becomes questionable why it is helpful for psychological theories and psychotherapy modalities to be linked to neuroscience research. Cozolino ends discussion of this issue entirely with the final statement "there is no easy way around this." He did not further discuss the important dilemmas that necessarily follow from acknowledging that integrating psychological and neurological language is a questionable or possibly inadequate way of describing a singular unified process.

Denying responsibility as the author if readers interpret his book as supporting a reduction of mind to brain. Cozolino began his book by denying that reductionism was likely to result from it, yet he concluded his book with a statement claiming that he was blameless if such an interpretation resulted.

And while I dislike reductionism as much as the next person, doesn't a tendency toward reductionism say more about the thinker than the nature of natural

phenomena? Our knowledge of neuroscience highlights the fact that we primates have complex and imperfect brains and should remain skeptical about what we think we know. In other words, primates would be wise to doubt their beliefs and remain open to new ideas. (p. 357).

Here Cozolino denied responsibility for the possible impressions or conclusions that audiences might draw from his mind-brain integration efforts, which was noteworthy for a book that relied heavily on neuroanatomy or other scientific terminology. In fact, he seemed to blame the reader for any improper interpretations of his text. This draws on a particular understanding of text interpretation. Further, the example set for therapists by abdicating responsibility for the effects of a book that could be influential also warrants highlighting, as he seemed to display indifference toward the broader historical contexts—both professional and societal—that are likely to make a brain-based psychotherapy book appealing. The passage was a surprising demonstration of an apparent disconnection between the claims of the text and an understanding of the broader cultural values that would make it appealing.

Appealing to neuroscience but rejecting the authority of neuroscience

“*experts.*” In Chapter 4 Cozolino proposed, “the question for therapists is: How amenable are these established structures to modification? This is a topic we will come back to again and again in later chapters” (p. 71). With that statement he seemed to imply that answering this question would be a central purpose of his text. In Chapter 11 he appeared to directly respond to this question, first by noting a shared interest among legislators, adoptive parents, and therapists in being able to identify which survivors of psychological trauma are likely to respond positively to psychological treatment or

reparative attachment efforts. However, he responded to the question by rejecting its premise rather than offering a neuroscientific answer.

Getting to the heart of the issue, the true question becomes: Who is worth seeing as a client, adopting as a child, or investing public funds in for rehabilitation? In my mind these are moral rather than scientific questions. I have become very skeptical of “experts” who think they have found answers to any issue in neuroscience. My bias is to trust in plasticity and our own ingenuity to discover new solutions to these problems. (p. 210)

Cozolino’s response to this question (which he earlier had identified as an important issue, and which would seemingly be paramount to the entire purpose of his book) is surprising in that he responded by rebuffing or declining to address the issue altogether. Several possible implications of his response warrant discussion. First, his refusal to address the issue raises the possibility that neuroscience may be unable to determine with precision which individuals can experience a reduction in psychological symptoms or behavioral change. In that case this issue would be better addressed by psychological rather than neurological research methods, as would the understanding of a therapy patient’s presenting problems and progress in a psychological treatment. His answer therefore casts doubt on the idea that neuroscience is sufficient for the purpose of devising, practicing, and studying mental health treatments apart from whatever psychological or other relevant concepts are connected to the study of the human brain.

Importantly, Cozolino also avoided answering the question that he had raised earlier by arguing that the question is a moral rather than scientific one and therefore cannot be answered by neuroimaging research. While the question does indeed raise moral issues, he seemed to be trying to appeal to the sentiments raised by that premise without exploring the possibility that psychological research and treatment could admit

that they are inextricably linked with issues of morality. However, by sidestepping the issue through acknowledging the limitations of neuroscience research, readers may also come to believe that the issue would be inadequately addressed by the psychological methods that are intertwined with brain research in the book. Therefore the doubt Cozolino cast on neuroscience with this statement serves a twofold effect. His response detracts from readers' ability to consider the ways in which psychology and psychotherapy research may actually be better suited to answer questions about mental health and individual change without neuroscience research. Moreover, his response discourages readers from considering ways in which they could engage in a more meaningful discussion about the role of morality in psychology and psychotherapy research (see Cushman, 1995; F. C. Richardson et al., 1999).

All of these examples of aporia raised questions about the extent to which human psychology can be correlated so closely with physiological underpinnings. It was noteworthy that Cozolino raised these significant issues and then backed away from engaging in any further discussion of them. This demonstrated that the way in which he managed or wrestled with the important societal implications he raised was inadequate and warrants further interpretation.

Diction. The following were examples of Cozolino's use of diction or word choice. Close attention to diction revealed how Cozolino attempted to integrate fields of study (primarily psychology and neuroscience) by combining or juxtaposing terminology from these unique fields. This subtle use of language to integrate epistemologies may not be apparent to many readers. In other words, in many passages his choice of words warrants close examination because they highlight how rhetoric was used to assimilate

mind and brain rather than a careful survey of the nuanced scientific and philosophical issues that brain research raises.

Integrating and synthesizing epistemologies. Cozolino's use of language was noteworthy for the various ways in which he synthesized neurobiological and psychological concepts by intertwining the terminology of separate fields of study in the same sentences. At times he acknowledged his integration of theories and at other times he seamlessly combined the vernacular or terminology from various fields without informing readers of the distinct fields of study or paradigms represented within single phrases or passages.

Synthesizing the purpose of psychotherapy with the effects of psychotherapy on the brain. These were examples of how Cozolino combined terms from distinct fields without informing readers that he had done this. This strategy was used to portray psychotherapy as a process of directly providing brain-based interventions through psychological or noninvasive means. For example, early in his book Cozolino defined "hidden layers" (p. 16) of the brain as the deepest levels of neural organization that are unobservable yet recognizable by the distortions and biases they project in the service of coherently organizing perception and behavior. Shortly therefore, he wrote,

"Based on observations of all levels of the client's behavior, the therapist attempts to bring the processing of the hidden layers to the client's conscious attention" (p. 35).

With the statement above, Cozolino described psychotherapy as the process of interpreting the hidden layers (presumably the hidden layers of the brain as he elsewhere discussed). In other words, instead of describing the purpose of therapy as revealing unconscious aspects of human experience, he described therapy as the process of

revealing the functioning of underlying neurobiological correlates of those unconscious experiences. In this passage the reader was not specifically informed about the integrative use of language, and therefore the psychoanalytic concept of the unconscious mind was presented as inseparable from or interchangeable with an understanding of the human brain.

The following passages were also exemplary of this mind-brain synthesis strategy.

“As therapists we intuitively work to regulate stress and integrate neural networks, a process that is essentially the opposite of the dissociation observed in reaction to trauma” (p. 21).

The organization of autobiographical memory that includes input from multiple neural networks enhances self-awareness and increases the ability to solve problems, cope with stress, and regulate affect. This integrative process is what psychotherapy attempts to establish when it is absent. (p. 207)

Successful psychotherapy for anxiety, fears, and phobias has been shaped by the necessity of integrating fast and slow circuits, taxon and locale systems, and affect and cognition. Educating patients about panic leads to increased participation of the cortex during anxiety states. (p. 258)

“On another level, the therapist serves as an external neural circuit to aid in the integration of networks left disconnected during development” (p. 283).

“The safe emergency of psychotherapy activates dissociated neural networks and attempts to reintegrate them in the service of decreased arousal and improved functioning” (p. 284).

Psychotherapists are trained to use their social brains as a tool to connect to and modify the brains of their clients. Through interpersonal neurobiological processes, therapists serve as an external regulatory circuit to help reestablish the optimal flow of energy and information. (p. 322)

With these passages Cozolino implied that by effectively providing mental health treatment, psychotherapists have unknowingly been utilizing neuroplasticity in order to restore or create healthy brain functioning. By portraying vocabularies typically used to

describe either mind or brain as interchangeable, these statements implied that mind and brain themselves are in fact interchangeable.

Reappropriating psychological terms as neurobiological concepts without directly informing readers of this strategy. At times Cozolino inserted psychological terms into descriptions of brain functioning without acknowledging the original uses of those concepts.

The statement “explicit memory is the tip of our experiential iceberg; implicit memory is the vast structure below the surface” (p. 77) was a good example of how Cozolino used a phrase with longstanding ties to the psychoanalytic metaphor for the unconscious (“iceberg”) in Freud’s theory of the topography of mind. Cozolino reappropriated the term for the purpose of mapping a psychoanalytic concept onto the human brain. Further, he implied that the concept had always referred to its underlying neurobiological substrate and that recent advances in neuroimaging are simply confirmation or objective proof of this claim.

Cozolino also referred to “the tripartite division of the brain” (p. 59), another reference to an early psychoanalytic concept of the three-tiered or tripartite mind comprised of id, ego, and superego. In the following statement, Cozolino used the psychoanalytic concept of enactment in a description of how the brain integrates visual perception with knowledge of language.

“While there is overlap of activation during picture naming, the nature of the visual image triggers brain areas relevant to what is depicted. Thus, memory is a form of internal enactment of whatever is being recalled” (p. 80).

In the statement above, Cozolino reappropriated the psychotherapy concept of enactment in his interpretation of a neuroimaging study in which researchers found that

the same part of the human brain that stored memory for the names of hand tools was the same part of the brain involved in the physical control over hands. In other words, through the misuse of a psychotherapy concept Cozolino portrayed the brain as the location of integration between physical and psychological aspects of human beings.

These examples were important because Cozolino did not inform readers of his synthesizing of two epistemologies, so some readers might not immediately recognize his efforts or their implications. In the next section I show how Cozolino acknowledged his integration between psychological and neuroscientific epistemologies.

Explaining one field of study from the perspective of another field of study. At times Cozolino described how one field of study (i.e., psychotherapy) could be interpreted by another field of study, putatively demonstrating how a single human phenomenon or activity may be described in equally helpful ways by separate fields of study (i.e., neuroscience).

“Remember, from the perspective of neuroscience, psychotherapists are in the brain-rebuilding business” (p. 33).

“From the standpoint of neurobiology, most of Freud’s work addressed the discontinuities and dissociations between networks of conscious and unconscious processing. Freud focused on the role of overwhelming emotion as the cause of unintegrated neural processing” (p. 33).

In the second example above, Cozolino acknowledged that he was providing a neurobiological interpretation of Freud’s work, and then provided an example of the argument using direct or matter-of-fact language, as if the argument was no longer an interpretation. The effect on the reader may be a blurring of epistemologies that uniquely embody aspects of the historical eras from which they separately emerged, or an

interpretation of history (especially the history of science) as linear, inevitable, and removable from the circumstances that gave rise to their discourses and their appeal.

Freud believed that a fundamental goal of therapy is to make the unconscious conscious. From the perspective of rebuilding the brain, this goal can be described as increasing the interconnection and integration of neural networks dedicated to unconscious and conscious memory. This process makes understanding the evolution, development, and functioning of the various systems of memory crucial to conceptualizing and treating psychological distress and mental illnesses. (p. 74)

Here Cozolino provided a neuroscience interpretation of the psychoanalytic concepts of conscious and unconscious mind. He then used this to argue that it is “crucial” for psychotherapists to understand the brain systems related to memory in order to understand and provide treatment for psychological conditions. It was unclear from this passage why knowledge of neurobiology is necessary for providing psychological treatment.

In the passages above, the importance of neuroscience as confirmatory research for psychological theories was taken for granted. This underlying assumption led to Cozolino’s use of assertions instead of arguments, since arguments are based on a structure of logic that builds to a plausible conclusion or understandable theory. Theorists and historians such as Canguilhem (1977/1988) have criticized this type of ahistorical understanding of science whereby current findings or paradigms are portrayed to explain or correct earlier theories from other fields of study.

Incorporating neurobiology into the definition of a psychological concept. The following passages suggested a rewriting of traditional psychological conceptualizations of mental experiences as neurobiological processes. The implication of these statements was that brain research serves as proof of a timeless truth, rather than brain research

being portrayed as a contemporary or recent revision to concepts typically under the domain of psychological theories.

“Freud’s *projective hypothesis* described the process by which our brains create and organize the world around us. As the clarity of a situation decreases, the brain naturally generates structure and projects it onto the world” (p. 34).

“Early relationships become encoded in networks of sensory, motor, and emotional learning to form what dynamic therapists call *inner objects*” (p. 41).

“Early brain development is highlighted by periods of exuberant neural growth and connectivity called *sensitive periods* triggered by the interaction of genes and experience” (p. 70).

“Estimating reward value is a joint operation between the *ompgc* and the amygdala (Dolan, 2007; Gottfried, O’Doherty, & Dolan, 2003). Much of this analysis occurs out of conscious awareness and is commonly called *intuition*” (Cozolino, 2010, p. 127).

Cozolino suggested that certain key words in psychological discourse are shorthand for descriptions of the neurobiological processes from which they result. Although physiological processes are present in any human experience, emphasizing that fact shifts the primary understanding of what it means to be human or to have a subjective experience away from the psychological and toward the physiological. For example, by asserting that object relations theory has been proven by neuroscientific research, Cozolino created a materialist explanation for structuralism.

Although the combination of neuroscientific and psychological vernaculars might seem to legitimate psychological and psychotherapy concepts by pairing them with material correlates, Cozolino’s uses of these diction strategies also suggest an effort to validate neuroscience, since the psychological concepts are part of common parlance and important aspects of Western culture. Therefore, although neuroscience is already popular and appealing (see pp. 23-24), synthesizing neurobiological and psychological

concepts in the way that he has done seems to introduce a discourse centered on a neuroscientific understanding of self into everyday language.

Repetition. Cozolino used recurring words across a variety of contexts in order to subtly portray themes or bolster arguments. Here I provide several examples of this rhetorical device and the subtle implications of the varied uses of key words.

“*Best guess.*” Cozolino used this phrase to describe neuroscientific speculation about the brain, and to depict the brain itself as engaging in speculative thinking (see also *Personification*, pp. 209-211).

“Although these movements may look random, they are the brain’s best guess at which movements will eventually be needed” (p. 68)

“What do we inherit, and what do we learn from experience? Our best guess is that almost everything involves an interaction between the two” (p. 64).

Our understanding of the brains of individuals with ADHD is still limited. . . . The best guess at this point is that individuals diagnosed with ADHD likely reflect a number of subgroups with different types of brain involvement. (pp. 131-132)
 “Our best guess is that larger and more complex brains allow for more diverse responses in challenging situations and across diverse environments” (p. 214).

By using the same phrase to describe both the brain and current neuroscientific hypotheses about the role of brain functioning in human development, Cozolino portrayed a similarity between the tendencies of the brain and the tendencies of humans who study it.

“*Bias.*” Cozolino used this word to describe personal beliefs (including his own beliefs), common beliefs or tendencies among individuals, and tendencies or typical processing in the brain.

“These connections, and their bias toward the right hemisphere, are associated with extremes of emotional processing” (p. 121).

“The consistency of many perceptual and cognitive biases across individuals reflects our shared neural organization and functioning” (p. 136).

“I have become very skeptical of ‘experts’ who think they have found answers to any issue in neuroscience. My bias is to trust plasticity and our own ingenuity to discover new solutions to these problems” (p. 210).

The word bias was used to imply that humans and the brain both have opinions. By reducing the concept of an opinion to a guess, Cozolino reaffirmed the privilege of objective quantitative studies. This implies that for now such guesswork is the best that can be done until progressive science provides conclusive proof for whatever is being studied (e.g., the relationship between brain function and human experience).

“*Complexity.*” Cozolino used this word to describe brain functioning that is capable of facilitating the multifaceted psychological processing necessary for the range of behaviors required for adequate functioning in modern civilization. He also used the word complexity to describe psychological functioning, and to generally describe intricate systems that emerge from their constituent parts.

“To accomplish the complexity required for behavior, neurons organize into neural networks” (p. 14).

Psychotherapy can be thought of as a specific type of enriched environment that promotes social and emotional development, neural integration, and processing complexity” (p. 20).

“A basic assumption of both neuroscience and psychotherapy is that optimal functioning and mental health are related to increasingly advanced levels of growth, integration, and complexity” (p. 25).

“Although redundant hemispheres provide certain benefits, such as a backup system in case of injury, hemispheric specialization via natural selection promotes neural complexity” (p. 94).

The focus on integration exists at each level of nature’s complexity from neurons to narratives to nations. As systems become more complex, it takes more

sophisticated mechanisms and increasing amounts of energy to support their continuing interconnection and homeostatic balance. (p. 174)

“Because increasing complexity requires greater interdependency, our brains have come to exist more and more profoundly within a matrix of other brains” (p. 216).

“The very complexity of the development and functioning of the brain is also what makes it such a fragile structure” (p. 321).

Cozolino’s use of the word complexity implied a connection between the properties of the human brain and the advancement of civilization, and equivalence between the goals of psychotherapy and the findings of brain research. Importantly, in these passages the word complexity substitutes for a delineated, logical explanation for how the brain creates reality, facilitates a coherent perception and interpretation of that reality, and correlates with the advancements of human societies. The assertion that mental processes are complex is not a substitute for an argument.

“*Fragile.*” Personal identity, the self, and the brain were all described as fragile.

“Stories connect us to others prop up our often fragile identities, and keep our brains regulated” (p. 163).

“Pathological states highlight the fact that the self is a fragile construction of the brain” (p. 286).

“The very complexity of the development and functioning of the brain is also what makes it such a fragile structure” (p. 321).

Together these passages implied that self and brain have similar qualities, and in the second passage above Cozolino directly suggested that self is generated by the brain. By using the word fragile in a variety of contexts Cozolino substituted a comparison or a use of rhetoric for a coherent argument about how self emerges from the brain. Although brain disease and injury can certainly alter psychological experience and identity, the use of the word fragile in descriptions of self and brain cannot substitute for an articulate

explanation of how understanding typical experience as the product of brain functioning is scientifically accurate or a helpful paradigm for therapists and general audiences.

“*Plasticity.*” Cozolino discussed the plasticity of the human brain as the quality by which the brain changes or adapts in relation to the environment in which a person exists. He also used that word to describe the self.

“Neural plasticity refers to the ability of neurons to change the way they are shaped and relate to one another as the brain adapts to the environment through time” (pp. 56-57).

“Patients with multiple personalities are perhaps the most complex example of the plasticity of self, because they generate many different subpersonalities associated with different experiences and emotional states” (p. 287).

Because neural plasticity was a central concept for Cozolino’s brain-based psychotherapy theory, the assertion that the self also has plasticity suggested a use of rhetoric to either conflate self and brain or to imply that self emerges from the functioning of the brain.

“*Primitive.*” Cozolino used the word primitive to describe the early development of the brain, maladaptive psychological defense mechanisms, and traditional or relatively less-advanced societies.

Freud argued that in order to understand who and what we are, we need to understand the primal unconscious elements of experience. He called this the *id*—the primitive and uncivilized life energy that we share with our reptilian and mammalian ancestors. (p. 3)

“The more primitive or immature the defense mechanism, the more reality is distorted and the more functional impairment occurs” (p. 34).

“Evolution has shaped the primitive areas of our visual brains to recognize and react quickly to threats from possible predators” (p. 80).

“Winnicott defined the early and intense focus on the baby as *primary maternal preoccupation*, and understood it to include the mother’s absorption into and attunement to the experiences with her baby’s primitive developmental state” (p. 189).

Co-constructed narratives form the core of human groups, from primitive tribes to modern families. The combined participation of caretakers and children in narrating shared experiences organizes memories, embeds them within a social context, and assists in linking feelings, actions, and others to the self. (p. 207)

Stress impairs or downgrades the functioning of the locale system, causing us to fall back on the more primitive organization of taxon (amygdaloid) systems. From a psychoanalytic perspective, this process may be understood as regression to more primitive self states and defense mechanisms. (pp. 257-258)

“The most primitive subcortical fight-or-flight circuitry, shared with our reptilian ancestors, interacts with the most highly evolved regions of the cortex” (p. 289).

The recurring use of the word primitive described a linear and hierarchical transition process for a brain, a psyche, and a society. How these concepts are interrelated, aside from Cozolino’s use of evolution to vaguely connect them all, was unclear. Regardless, his use of evolutionary theory to substantiate differences between industrialized and pre-capitalist societies overlooked the well-known controversies associated with the use of evolutionary theory as an explanation for differences in cultural and economic arrangements that overlooks the impact of global war and colonialism over the past several hundred years.

“*Trial and error.*” Cozolino used this recurring phrase to describe human learning, the effects of learning on the brain, and the history of psychotherapy during the 20th century.

“Learning within neural networks occurs as a result of trial and error” (p. 16).

“Like other scientific discoveries, psychotherapy developed from a combination of trial-and-error learning, the intuition of its founder, and plain luck” (p. 32).

Only through trial-and-error learning are early clumsy movements slowly shaped into functional skills. Children and their brains intuitively know this and will resist being held back or helped too much. When we attempt to help, a child's impatient protest of "Let me do it!" reflects instinctual wisdom of the importance of trial and error learning in the growth of neural networks. (p. 69).

The use of this phrase in these three contexts implied similarities between the processes of brain growth and development, childhood development, and the development of the important cultural institution of psychotherapy. Collectively, these passages scientized human development and cultural institutions such as psychotherapy.

"*Worlds.*" Cozolino used the term worlds to describe various aspects of psychological experience, change, and the features of self that explain and facilitate the potential for change.

"Our imaginations can simultaneously create exciting new worlds, as well as the fears that prevent us from living in them" (p. 10).

"These unconscious memories organize our inner worlds when we are with others and when we are alone" (p. 41).

"The cortex is experience dependent, which means that it is shaped through countless interactions with our social and physical worlds. In this way we grow to adapt to the particular niche into which we are born" (p. 59).

"In the middle of the second year, a growth spurt occurs in the left hemisphere and an explosion in language and locomotion launches children into the broader physical and social worlds" (p. 95).

"From a psychodynamic perspective, these patients seem trapped in secondary process thinking, disconnected from their inner physical and emotional worlds" (p. 107).

"Dorsolateral areas exhibit an initial lag and then growth spurt with the development of language and the exploration of our physical and conceptual worlds" (p. 122).

"In essence, both inner and outer worlds need to be balanced and adequately regulated for optimal functioning" (p. 128).

Cozolino used the term worlds in varying contexts in order to portray individuals and social phenomena as existing in separate realms or realities. This implied a dichotomous private and public existence, a move that reinforces the early modern value of innerness. Although psychological theories have traditionally been based on modern era philosophy and its vision of a self or subjectivity that is separate from the neutral and scientized material world, the language in the passages above were especially contradictory of mind-body integration that Cozolino seemingly used neuroscience as a way to overcome. In other words, the statements above suggest mind-body dualism.

In sum, the examples of repetition in Cozolino's text suggested a subtle way of portraying important concepts or entities as related or even quite similar, either without formal arguments or as a way to unsuspectingly reinforce arguments he had posited. Over the course of a reading of his book it might be easy to overlook the covert yet persuasive effects of this rhetorical strategy.

Speculation language. Cozolino's use of language that implied a finding or argument to be only potentially true was ubiquitous. He also used this rhetorical strategy to predict future neuroscience discoveries. At times Cozolino juxtaposed speculative statements with statements that suggested certainty.

Speculation about the fit between neuroscience findings and general psychological phenomena. The following statements exemplified uncertainty about mind-brain integration.

“What Charcot and Freud called dissociation and hysteria could well have been the result of inadequate integration and coordination among these different, cohabiting brains” (p. 6).

“By activating processes involved in secure attachment, empathic attunement likely creates an optimal biochemical environment for neural plasticity” (p. 46).

“The emotions, images, and thoughts that emerge in conditions of low stimulation (or the absence of distraction) may hold clues to the workings of our brains and the aftereffects of early learning” (p. 88).

“Perhaps the left hemisphere interpreter may explain why we are all above average in our own minds” (p. 103)

“The momentary bubbling up of feelings or images, which are then quickly lost, may reflect one aspect of the intrusion of right hemisphere processing into left hemisphere control” (p. 104).

Given that we use our internal expressions as implicit models for how we understand others, it could be that what Freud called the defense mechanism of projection is actually a simple byproduct of how our brains interweave our automatic theories of others’ minds with understandings of ourselves. (p. 314)

Speculation about the fit between neuroscience and psychology or psychotherapy theories implied hope or expectation that future brain research will confirm or deny hypotheses about the relationship between mind and brain. Scholars (e.g., Brothers, 2001; Uttal, 1999) have cautioned that this rhetorical strategy in cognitive neuroscience literature is likely to cause audiences to mistake a faith in future scientific studies for actual scientific facts, thereby ignoring the flawed logic underlying many studies trying to ascertain neurobiological correlates for psychological concepts. In other words, this rhetoric is likely to cause some readers to confuse the goals of neuroscience with the established findings of neuroscience, which mistakenly reinforces a possibly unfounded synthesis between brain functioning and the concept of mind or mental states.

Speculation about evolution. Cozolino’s central premise was that evolutionary theory is an explanation for human neurobiology and therefore for psychology, psychotherapy, and contemporary human societies (see also *Themes*, pp. 213-220).

However, he acknowledged that some of the claims generated by evolutionary theory are hypothetical.

The portion of the visual system activated by pictures of animals is an area involved with very early stages of visual processing. This may be a reflection of how evolution has shaped the primitive areas of our visual brains to recognize and react quickly to threats from possible predators. (Cozolino, p. 80)

“This model of laterality may have reflected an intermediate evolutionary stage between having two modes of conscious awareness and our current bias toward right hemisphere inhibition” (p. 109).

“It is likely that evolution has used these core visual-spatial networks to serve as an infrastructure for language” (p. 143).

Spoken language is sound, which primitive fear circuitry is able to silence. Perhaps those early prehumans who hung around for conversation and negotiation with predators didn't fare well enough to pass down as many genes as did those who either kept quiet, fought, or ran away. (p. 278)

Cozolino's speculation about evolutionary processes that were quite central to his brain-based psychotherapy theory raises a broader uncertainty about his mind-brain integration efforts altogether. In other words, speculative rhetoric about human evolution naturalized psychotherapy and psychological problems by depicting them as products of intrinsic physical processes and suggested that his integration project may be more of a precarious effort than the frequent use of scientific terminology and a steadfast attitude toward the subject matter might otherwise suggest. The rhetorical strategy could therefore serve as a way for Cozolino to circumvent criticism about his weighty claims about human functioning and the relationship between mind or self and brain.

Speculation about the history of psychotherapy. In Cozolino's introductory chapter he described the purpose of his book as building on Freud's original intention of

a brain-based explanation for human psychology (see *General history of psychotherapy according to Cozolino*, pp. 107-110; see *History of Cozolino's psychotherapy theory*, pp. 113-117). However, Cozolino acknowledged some uncertainty about relevant historical details.

“Freud started out as a rebel, a neurologist curious about the mind. I suspect he was frustrated with the mind-brain partisanship of medical school, and longed to work with others who shared his interests” (p. 1).

In Charcot, Freud sought a teacher who was well-established, confident, and unafraid of the no-man's-land between mind and brain. One can imagine Freud's excitement as he walked the streets of Paris on his way to meet the great man, a possible kindred spirit (p. 2).

“Perhaps Freud kept the *Project* to himself because he feared that it would be relegated to the same sort of obscurity as the case of Phinneas Gage” (p. 4).

“Perhaps Freud anticipated that in the future, psychoanalysis would eventually be integrated with its neurobiological substrates” (p. 5).

Cozolino's speculations about the history of psychotherapy cast doubt on the purpose of his text as building upon Freud's original intention of a brain-based understanding of human experience as Cozolino initially explained. Speculative rhetoric in these passages suggests an attempt to hedge on these historical claims, circumventing criticism about the use of an origin myth (claiming that psychotherapy emerged from neurology) to justify a merger between the two fields now that neuroimaging technology has advanced dramatically.

Speculative language alongside language implying certainty. At times statements that were speculative were placed alongside statements in which Cozolino's choice of language denoted a significant amount of certainty.

The early interpersonal environment may be imprinted in the human brain by shaping the child's neural networks and establishing the biochemical set points in

circuitry dedicated to memory, emotion, safety, and survival. Later, these structures and processes come to serve as the infrastructure for social and intellectual skills, affect regulation, and the sense of self. (p. 10)

In this passage Cozolino first speculated that early relationships have a role in organizing structures of the brain that have been implicated in a variety of psychological experiences (memory, emotion, safety, and survival) and he then asserted that these brain structures are related to psychological aspects of human functioning (intellectual skills, affect regulation, and the sense of self). Therefore he drew a conclusion based on a hypothetical argument. In the following passages he also used this strategy.

In taking a sample of general theoretical approaches to psychotherapy, we will look for common elements among them, and how these elements may relate to neural network development. Remember, from the perspective of neuroscience, psychotherapists are in the brain-rebuilding business. (p. 33)

Here Cozolino speculated that common factors of psychotherapy theories are related to underlying neural integration, and then stated with certainty that therapy is a “brain-rebuilding” task. This rhetorical strategy implies that a strong belief in therapy as a brain intervention may suffice for conclusive evidence supporting that claim or explaining its relevance. The passage is therefore noteworthy because it shows how confidence in brain research and in the assumption that brain and selfhood are closely linked (or even interchangeable concepts) is such a powerful belief that speculating about the specific science that could support this claim is permissible.

“Earned autonomy is convincing evidence that early negative experiences can be reinstated and repaired later in life. Personal growth has the ability to heal because the social brain remains plastic” (p. 209).

With the phrase “convincing evidence,” Cozolino first speculated that individuals are able to overcome the negative effects of early experiences, yet he then stated with

sureness that healing is enabled by neuroplasticity. This was surprising because it would seem that the capacity for psychological change has been well established, in fact, probably more established than the neuroscience thought to underlie the types of healing experiences Cozolino described. This juxtaposition of speculation and certainty was noteworthy because it suggests unnecessary doubt about psychology amidst possibly unfounded certainty in the ability of neuroscience to attenuate that doubt by serving as a material truth about psychological concepts and the cultural values that they embody. In other words, by juxtaposing speculation and certainty in the passage above, Cozolino privileged recent scientific research (and the assumption of objectivity in that research) over a longstanding psychological theory (attachment theory). Because it is unclear why psychologists would need neuroscience to prove the relevance or accuracy of this theory, the passage reinforces the model of a higher-order or higher-status science confirming that a psychological concept or paradigm is an accurate understanding of human functioning.

Like the attachment system...the development of this engagement system and the fine-tuning of the vagal brake to regulate affect appear to depend on the quality of attachment relationships in early childhood. This allows us to internalize what we learn from experience with caretakers into moment-to-moment somatic regulation. (p. 234).

In this passage Cozolino first speculated that the development of brain structures that are related to affect regulation is dependent upon the quality of early relationships, and then he concluded with an attitude of certainty that these developmental processes explain how self-control of the body is facilitated by formative early relational experiences. This passage highlights a significant contradiction because he at once claimed that scientists know and do not know that brain research explains how the quality

of early relationships is related to later psychological functioning and stability. Similar to the previous examples of this rhetorical device, this passage is noteworthy because it shows how Cozolino assumed or relied on a strong belief amongst readers in a relationship between self and brain to obfuscate the lack of clear evidence for a direct relationship between affect, attachment, and brain functioning.

In sum, the examples of placing speculation language alongside language implying certainty were noteworthy because they exemplify a reliance on a strong convictions of a relationship between mind or self and brain in order to assert conclusions about the brain based on claims that remain unproven.

Predicting future discoveries. At times Cozolino suggested that continued brain research will eventually answer some of the difficult yet important questions about human mind and consciousness.

In the case of the imagined memory, the prefrontal area also becomes activated, reflecting its role in processing the instructions, staying on task, and accessing imagination. How neural networks in the prefrontal cortex know how to do this is as yet unknown. (p. 80)

How does the brain achieve conscious awareness? Where is the seat of consciousness? The answer to both of these questions is that we don't yet know. At this point, we must be satisfied with discovering pieces of this complex puzzle of consciousness that will be assembled sometime in the future. (p. 140)

“Although this research has yet to be done with humans, the behavioral and neurobiological parallels between rats and humans are striking, making rats very helpful in understanding the interpersonal aspects of neurobiology” (p. 214).

“As the dialogue between psychotherapy and neuroscience continues to evolve, an increasing number of scientific findings will be applied to both theory and clinical practice” (p. 342).

With these statements Cozolino used speculative rhetoric to portray the discovery of the neurobiological locations of mind or human experience as inevitable. Cozolino's

predictions for a confirmed material understanding of human psychology may generate excitement, yet this view is not without scientific and philosophical controversies, and seems to have little to do with improving the practice and profession of psychotherapy. In Chapter I, I discussed the widespread optimism about neuroscientific advances contributing to the alteration of life on a genetic and molecular level that scholars believe to be a firmly engrained aspects of contemporary Western selfhood (see Rose, 2007), the well-documented criticisms of the use of this optimism as a rhetorical strategy in cognitive neuroscience literature (see Brothers, 2001; Vidal, 2009), and the arguments against the neuroscientific efforts to localize consciousness within the brain (see Bennett & Hacker, 2003; Noë, 2009; Tallis, 2004). In light of those critical perspectives, the use of a psychotherapy text as a venue to perpetuate neuroscientific speculation should be brought to the attention of psychotherapists studying this material or applying it to clinical practice.

Cozolino providing personal speculations. In several passages, Cozolino (2010) provided personal (and therefore unconfirmed) interpretations of neuroscience research.

“I strongly suspect that left-right integration is an experience-dependent process” (p. 109).

“In my mind, the parallels as well as the tendency for evolution to conserve such mechanisms form a strong case for the theory that what Meaney and his colleagues are finding in rats is at work in humans” (p. 223)

What might be happening in the brain during and after an accurate and well-timed interpretation? Each interpretation that hits home is like the death of a small aspect of the false self. My suspicion is that it begins with seeing past the products of the left hemisphere interpreter, which disinhibits the activation of subcortical circuits containing negative memories. (p. 295)

“I suspect that telling the story builds circuitry, which contributes to amygdala inhibition and the dissipation of fear” (p. 307)

These speculative statements demonstrated how Cozolino (2010) expressed personal interest or investment in neuroscience research by proposing his own interpretations of it. This strategy implied that with sufficient interest in the integration of neuroscience and psychology, one individual may impact popular beliefs about the relationships between brain functioning and human psychology or self. In fact, the final chapter of his book (“The Psychotherapist as Neuroscientist,” pp. 341-358) begins with a quote (see *Epigraph* below) by seminal neuroscience researcher Eric Kandel about this field of study: “Unlike other areas of science, it is still possible for an individual or small group to make important contributions” (p. 341). With the passages above Cozolino illustrated those exact efforts and he depicted an interest in neuroscience as a way for psychotherapists to contribute to a grander and epochal scientific endeavor. This is significant because the depiction of psychotherapists as brain science enthusiasts represents a departure from the generally understood purpose of therapy and the professional identity of therapists.

These statements are also noteworthy because they exemplify the problems with cognitive neuroscience that Brothers (2001) highlighted in her discussion of how authors are able to creatively permeate cognitive neuroscience with tenuous claims about human experience and the brain that are actually disguised cultural discourses, since cognitive neuroscience lacks a central organizing theory against which to test hypotheses (a defining characteristic of other scientific disciplines), the brain is extremely complicated and contemporary brain science is relatively new, and the vernaculars of psychology and brain science might be fundamentally incompatible (see also Bennett & Hacker, 2003).

Epigraph. Cozolino started every chapter and each subsection of every chapter with an epigraph, that is, a short quote from any one of a variety of historical figures, scientists, authors, psychotherapists, and others. The quotes represented a wide array of statements on topics ranging from scientific issues to general human concerns. The variety and placement of the quotations suggested that they were intended to link mind-brain research with psychotherapy and broader values or principles with which readers may find solace. In other words, they were used to depict brain-based explanations for psychotherapy and human psychology as being intuitive, natural, and highly relevant to nearly any endeavor to which neuroscience is applied.

For example, Chapter 11 (“Building the Social Brain: Shaping Attachment Schemas”) begins with the quote, “Experience is a biochemical intervention” by Jason Seidel (p. 197). To introduce Chapter 7 (“The Executive Brain”), he quoted Virginia Woolf, “My own brain is to me the most unaccountable of machinery—always buzzing, humming, soaring roaring diving, and then buried in mud. And why? What’s this passion for?” (p. 115). To introduce Chapter 14 (“Trauma and Neural Network Dissociation”), he quoted Virginia Woolf again, “The beauty of the world has two edges, one of laughter, one of anguish, cutting the heart asunder” (p. 262). In Chapter 12 (“The Neurobiology of Attachment”), to start the subsection titled “The Human Social Brain,” Cozolino quoted the French Renaissance philosopher Montaigne, “It is good to rub and polish our brains against those of others” (p. 227).

By providing such a large number and variety of quotes from important figures likely to be regarded as wise, daring, or socially impactful, Cozolino implied that there is a broad societal significance to each chapter and subsection, and showed that the

significance of neuroscience research transcends specific historical eras because it confirms whatever was observed or suspected about humans beings generally and the social arrangements humans have formed. Because the epigraphs that Cozolino selected were short and used without further elaboration, they seem to support especially a sense of universality of his efforts. In other words, epigraphs supported the argument that much of human culture, history, successes, and problems are explainable by the evolution of the brain, and that over time many great figures realized this. The quotes set a frame for his chapters and subsections as supporting a vast array of disciplinary efforts through the expansive scope and incisiveness of epigraphs that preceded each one. By placing his chapters and subsections alongside quotes from prominent and insightful figures, Cozolino might also be regarded as bold or revolutionary for tying brain research to psychology and therapy in such a comprehensive effort.

Figures of speech. The following were examples of figures of speech in Cozolino's book that are disguised forms of persuasion (for further examples of Cozolino's use of this rhetorical strategy, see Appendix B, pp. 325-328).

Apposition. Examples of apposition (that is, the use of a phrase consisting of a noun used to modify or describe another noun), included "attachment circuitry" (p. 211, p. 210, p. 184), "familiarity circuits" (p. 153), "social brain" (p. 8, p. 244), "social engagement system" (p. 233), "social neural networks" (p. 182), and "social synapse" (p. 179, p. 180, p. 195, p. 182, p. 187, p. 189, p. 196).

Apposition synthesized neurobiological and psychological or colloquial concepts, thereby identifying a typical subjective experience by emphasizing its neurobiological origin. These phrases easily insert neurobiological terms into common descriptions of

subjective experience, thereby encouraging a discourse that perpetuates a reductionist and mechanical vision of self through a disguised form of persuasion.

Metaphor. Cozolino used metaphor (that is, a comparison between two objects or concepts without using the words “like” or “as”). The metaphors he selected for describing the brain represented several recurring categories of objects or themes.

Human development metaphors used to describe the brain. Cozolino often compared the development of the brain to the physical and psychological development of a child.

“Consequently, many of our most important socioemotional learning experiences are organized and controlled by reflexes, behaviors, and emotions outside of our awareness and distorted by our immature brains” (p. 9).

“In contrast to the brainstem and limbic system, the cortex is immature at birth and continues to develop throughout adulthood” (p. 68).

“The maturation and sculpting of so much of the cortex after birth allows for highly specific environmental adaptations” (p. 72).

“During the first 2 years of life, the right hemisphere has a growth spurt” (p. 95).

“In contrast to the amygdala, the hippocampus is a late bloomer, continuing to mature into early adulthood” (p. 231).

These metaphors paired images of human maturation with descriptions of the brain, implying an association between developmental stages and the growth or expansion of the brain during each stage. Cozolino’s use of developmental metaphors had the effect of humanizing the brain and naturalizing human development concepts. By unproblematically sharing psychological and neuroscientific discourses, these metaphors foster a vision of human development that is synonymous with, or reduced to brain development. This vision reproduces the understanding that the brain is the only entity

needed for the self, or as Vidal (2009) noted, the brain and the self become “consubstantial” (p. 7).

Technology metaphors. Cozolino often described the structure and function of the brain as a computer or other communication and information processing device.

“Although we usually think of the cortex as a giant hard drive capable of storing huge amounts of data, another primary role of the cortex is inhibition” (p. 22).

“In order for a neuron to survive and grow, it must wire with other neurons in increasingly complex interconnections” (p. 67).

“Because these neural networks are sculpted during early interactions, we emerge into self-awareness preprogrammed by unconsciously organized hidden layers of neural processing” (p. 72).

“Early memories stored in circuits of the amygdala and right hemisphere can intrude into adult consciousness in a variety of ways” (p. 87).

“Although redundant hemispheres provide certain benefits, such as a backup system in case of injury, hemispheric specialization via natural selection promotes neural complexity” (p. 94).

“Genetic expression is programmed by experience” (p. 217).

“We have seen a great deal of evidence of the impact of early nurturance on the shaping of the social brain and its emotional circuitry” (p. 227).

“In fact the human brain is criss-crossed with neural networks dedicated to receiving, processing, and communicating messages across the social synapse” (p. 227).

“Since the networks connecting the *ompc* and the amygdala are shaped by experience, our learning history of what is safe and dangerous, including our attachment schema, is thought to be encoded within this system” (p. 231).

These metaphors were noteworthy because they equate the brain with contemporary machinery, thereby also equating the functioning of the self with the functioning of modern devices devised by applied science. In other words, this figure of speech reduces human mentation to machine processes.

Building and infrastructure metaphors. Cozolino characterized the structure and functioning of the brain by comparing it to architectural design and infrastructure.

“A therapist attempts to restructure neural architecture in the service of more adaptive behavior, cognition, and emotion” (p. 9).

“The neural architecture of the brain comes to embody the environment that shapes it. You could also think of our neural architecture as a tangible expression of our learning history” (p. 19).

The way we organize and understand ambiguous stimuli gives us clues about the architecture of the hidden layers of neural processing (how our unconscious organizes the world; p. 34).

“This process most likely enhances the growth of omgpc and dlpgc systems, while building new brain networks to bridge the two for higher level awareness” (p. 161).

“The hippocampus is constantly remodeled in response to new information” (p. 310).

By describing the brain as a physical structure that manifests self and personal history, Cozolino portrayed psychological changes or changes in self in a highly reified and materialistic manner.

Earlier (see pp. 9-16) I discussed examples of historical research about neuroscientific endeavors that suggested ways in which the brain has been used in popular culture to depict a materialization of mind or psyche in accordance with various Western cultural and societal movements during the 19th and 20th centuries. The metaphors above suggested ways in which Cozolino replicated that trend. In the context of a book promoted as a psychotherapy text, these metaphors extract self (and therefore valuable concepts such as insight and agency) from social context and instead place self in a discourse of instrumentalism and materialism regardless of the appeals to visions of self as inherently social, or initially formed within the context of relationships, which also

appear in his text. This produces a basic contradiction in Cozolino's argument that works against his professed ideals.

Personification. Personification is the attribution of human abilities to nonhuman objects. Cozolino used personification to depict the brain as possessing qualities or capable of performing tasks typically associated with human beings.

“A brain which is challenged comes to be more complex, active, and robust” (p. 19).

Our cortex then provides us with rationalizations and beliefs about our behaviors that help keep our coping strategies in place, possibly for a lifetime. These neural and psychic structures can lead to either psychological and physical health, or illness and disability. (p. 23)

“The very way that the brain has evolved to successfully cope with immediate threat appears to have created a vulnerability to longer term psychological distress: Enter psychotherapy” (p. 25).

“The neural circuitry involved with fear has a tenacious memory and can invisibly influence conscious awareness for a lifetime” (p. 34).

After birth, newborns continue to move all parts of their bodies, allowing them to discover their hands and feet as they pass in front of their faces. Although these movements may look random, they are the brain's best guess at which movements will eventually be needed” (p. 68).

“This confabulatory and positive self-bias. . . also reflects the brain's basic instinct to engage in explanatory behavior for things it cannot understand” (pp. 103-104).

“The posterior parietal regions weave together sensory information about our physical environment with networks of organized motoric actions and intentions which (along with the frontal lobes) create goal-directed action plans” (p. 142).

“The brain's ability to take our physical experience and use it metaphorically is the basis of imagination” (p. 146).

“Thus, if our neurons become depressed so do we” (p. 220).

“So, by the time we become conscious of others, our brain has already made decisions about them” (p. 244).

“The amygdala can learn, throughout life, to pair any stimulus (even physical affection or praise) with fear” (p. 245).

“The existence of these sophisticated social neural systems reflects the millions of years of natural selection that have been refining our brain’s ability to read the emotions, thoughts, and intentions of others” (p. 314).

Personification of the brain was significant because it suggests that the brain has its own volition independent of individuals that influences and asserts control over behavior and thinking. The portrayal of the brain as a source of human experience and functioning implies an understanding of human selfhood as extracted from sociocultural expectations and reduces experience to an observable location within the human body. Since this rhetorical device renders agency, identity, and choice as concepts that are best studied through a scientific study of the brain, the understanding of human selfhood becomes greatly dependent upon however brain research is interpreted.

These statements evoke an understanding of human beings that is consistent with an interiorized yet materialized self, similar to the challenge to the idea of a “ghost in the machine” posited by philosopher Gilbert Ryle (1949). This view understands the brain to be the source of the mind and human behavior, thereby attempting to reconcile the problems of mind-body dualism based on the idea that mind is a nonmaterial entity (comparable to a ghost) inhabiting the physical body. Personification of the brain in these passages therefore establishes human agency as a matter of influencing or controlling brain functioning to gain control over one’s life, and it implies that without recent neuroscientific advances it would be unknowable why humans think, behave, and interact with each other in the ways that they do. As Vidal (2009) summarized, even when neuroscientific literature states an objection to reducing mind to brain, if personification

is used to describe brain functions, the result is a twofold reductionism: First, a reduction of self to brain, and second, a reduction of psychology or social knowledge to neuroscientific information.

Prosopopoeia. Prosopopoeia is a type of personification in which human abilities are ascribed to a nonmaterial entity or concept such as mind or emotion rather than a physical object such as brain.

“As affect is repeatedly brought into the therapeutic relationship and successfully managed, the client gradually internalizes these skills by sculpting the neural structures necessary for autoregulation” (p. 21).

“Flashbacks, memories from traumatic experiences, likely reside in amygdaloid-driven memory networks” (p. 86).

“Language within significant relationships has shaped the brain during evolution and continues to do so throughout our lives. (p. 343)

Narratives embedded within an emotionally meaningful relationship (like psychotherapy) are capable of resculpting neural networks throughout life” (p. 343).

“The pathways containing these traumatic memories become hyperpotentiated, meaning that they are more easily triggered by less severe subsequent stressors” (p. 249).

This type of personification was significant because it was used to explain how individual subjectivity is connected to the material or external world (which includes the human body itself) by depicting the brain as receiving nonmaterial experience and storing information or memories. Integrating the external world and private experience by describing the brain as a connective organ within the body assumes a split between public and private or social and individual realms in a way that perpetuates dualist philosophy.

Summary of rhetorical strategies and elements of writing style. In *The Neuroscience of Psychotherapy: Healing the Social Brain*, Cozolino (2010) applied a

variety of recurring rhetorical strategies that were noteworthy for how they fused mind and brain through his use of language. For example, some statements were ambiguous or unclear with regard to whether they were intended to refer to brains or to humans; other statements suggested (but did not clearly articulate) a relationship between brain functioning and mind or subjective experience. Further, Cozolino used analogies to imply specific relationships between human experience and neurobiology, yet often those statements also lacked any clearly delineated arguments. Cozolino's infrequent, brief, yet very important statements casting serious doubt on the entire premise of his book seemed to be what literary experts call *aporia*, and the dismissive and inadequate discussions about those doubts seemed to annul any genuine concern he might have had with those problematic aspects of his book.

Cozolino used diction (word choice) to redefine or reappropriate psychological terms as neuroscientific concepts, thereby synthesizing psychology and neuroscience through the use of rhetoric rather than through scientific argument. This obfuscated the boundaries between neuroscience and psychological or psychotherapy theories instead of directly defining those boundaries or giving good reason why they should be combined in such an unproblematic way. Epigraphs (quotes preceding chapters and subsections of the book) were ubiquitous and suggestive of an attempt to universalize Cozolino's neuroscience-psychotherapy integration and to portray brain research as providing evidence that confirms the legitimacy of timeless observations about humans and human society. Figures of speech were also frequent and they included metaphors (such as technological and child development metaphors for the brain), and personification of the structure and functioning of the brain. The figures of speech suggested reductionist and

scientized depictions of relationships between unique concepts or fields of study without adequate discussion about the implications of these discourses. In general, Cozolino's book was heavy with rhetoric in a way that is noteworthy in light of the criticisms leveled against cognitive neuroscience literature with regards to language that could be obfuscating or misleading despite appearing to many readers as legitimate and truthful scientific evidence that mind or self is easily studied through brain science.

Themes

In this section I discuss themes that emerged from recurring topics or arguments throughout Cozolino's book.

Evolution as a central organizing principle. This appeared to be Cozolino's overarching theme. He used evolution or Darwinian theory of natural selection to argue that the human brain is responsible for human development, psychology, self, psychological problems or illness, the emergence of psychotherapy as a mental health treatment, and physiological mechanisms of effective psychotherapy.

The evolution of the human brain explains the growth and advancement of human societies. Cozolino argued that humans organized into groups because doing so enhanced survival, which in turn supported the evolution of a brain capable of complex language and thinking abilities necessary for the advancement of societies.

“Using evolution as an organizing principle, we begin with the assumption that our highly social brains have been shaped by natural selection because banding together in groups enhances survival” (p. 177).

As social groups grew even larger, more cortical geography was needed to process increasingly complicated social information. This coevolution of relationships, language, and brain allowed for the development of higher levels of symbolic and abstract functioning. In other words, early caretaking and intimate

relationships are a fundamental building block in the evolution of the human brain. (p. 178)

In these passages Cozolino argued for a co-occurring and interdependent relationship between the progression of the brain across the history of the human species, and the advancement of human societies into their vast and complex manifestations. In other words, he asserted a correlation between changes in the brain and changes in human society but he evaded phrasing that would have posited a causal relationship. This naturalized culture, human relationships, and social order.

The evolution of the human brain explains human culture. Cozolino speculated that a variety of human abilities, endeavors, and shared traditions result from the evolution of the human brain.

Because of the evolutionary links between motor behavior and cognition, some theorists consider cognition to be a derivative of motor behavior (Wilson, 1998). Support for this idea may exist in that much of our symbolic and abstract thinking is organized by the visceral, sensory, and motor metaphors that permeate our language. (Johnson, 1987, as cited in Cozolino, 2010, p. 117)

According to Cozolino, the fact that some common metaphors use descriptions of physical abilities or sensations to illustrate abstract or nonmaterial concepts might be evidence that mind or cognition emerges from bodily processes. His argument extracted nuances of contemporary language such as figures of speech from their social and historical context and depicted them as illustrative of inseparability between mind and body. In other words, rather than embodying a shared way of communicating and understanding within a culture or social group, Cozolino instead portrayed certain metaphors as a means by which the human brain projects some primitive knowledge

about how the human species was adept at physical development and survival prior to its advanced psychological functioning.

“When we think of the human cerebral cortex, we may think of the accomplishments of music, art, and culture—products of cortical and especially prefrontal evolution” (p. 119).

This passage suggested that higher-order thinking abilities such as planning, organizing, mental manipulation, and abstract thinking, which have been associated with the functioning of the outer layers of the human brain, explain or are necessary for the remarkable human developments of “music, art, and culture” and the uniquely human way of creating and appreciating these social practices. While it is true that humans require brains for devising and sharing phenomena such as music and art, Cozolino made an assertion about the evolution of the brain (especially the cortex that he valorized) instead of building a coherent argument about how brain functioning explains societal institutions and their significant historical purposes. This is problematic because his assertion ambitiously conveys a reduction of social traditions and practices to the brain without providing a clear understanding for why this vision of human beings is accurate.

Our brains allow us to fashion clothing, build houses with heating systems, and create sophisticated farming techniques that allow us to expand our habitats and sources of food. But does this explain why we have relationships? We know that the expansion of the cortex in primates correlates with increasingly large social groups. (pp. 214-215)

With this passage Cozolino argued that the brain rather than societies facilitated the progression of civilization toward effectively functioning and providing physical sustenance to multitudes of citizens. He then used that argument to compare technological advancements to human relationships by asserting that both phenomena are enabled by the way in which the human brain evolved and the human cortex expanded.

Although complex social groups and complex human technologies may have emerged together, Cozolino's deemphasizing of human relationships or shared historical traditions exemplified how it is problematic or at least incomplete to apply Darwinian theory as an explanation for every aspect of human life. As with the passages above, his assertion cannot adequately substitute for a properly delineated argument.

The evolution of the human brain explains the emergence of self. In the following passage Cozolino attributed some of the defining features of self to the parietal lobes of the human brain, thereby using the evolution of the human brain as an explanation for the accuracy of the psychological theories of self that he favored.

The parietal lobes' interconnections with the rest of the cortex allowed for the integration of working visual memory, attentional capacities, and bodily awareness necessary for these imaginal abilities. This suggests that our self-awareness was likely built in a stepwise manner during evolution through a series of overlapping "maps"—first of the physical environment, then of self in environment, and later of self as environment. Thus, the growth of imaginal abilities allowed us to create an increasingly sophisticated inner topography. (p. 141)

Cozolino emphasized the concept of an inner world as a necessary and defining feature of self. With this concept Cozolino differentiated between public and private lives and the need to balance personal space or tolerance for being alone with interpersonal involvement or emotional attunement with other people. He portrayed the balance between these aspects of contemporary human beings as possible because of the way that the brain supports those competing and complementary needs. In other words, social artifacts such as the concept of the self are reduced in an ahistorical and scientized manner to neurological products. His passage naturalizes and materializes the concept of an inner world or inner self, and therefore also reduces psychology to neurology.

Psychoanalytic theory of mind was actually a description for how the human brain evolved and generates human experience. Cozolino described traditional psychoanalytic theory of mind as a description of the functioning of the human brain.

“Maclean described the human brain as a three-part system that embodies our evolutionary connection to both reptiles and lower mammals” (p. 5)

“What Charcot and Freud called dissociation and hysteria could well have been the result of inadequate integration and coordination among these different, cohabitating brains. MacLean’s description...roughly parallels Freud’s distinction of the conscious and unconscious minds” (p. 6).

Cozolino argued that Freud’s theory of a tripartite division of mind was unknowingly a description of the brain, which Cozolino understood to be comprised of three parts that produce competing needs and other aspects of human beings that Freud described. Earlier (see pp. 106-110) I discussed how this claim was a major premise for Cozolino’s mind-brain integration in the context of psychotherapy. These passages illustrate how a reduction of mind to brain entails a reduction of psychology to neurology and other neuroscientific disciplines, and Cozolino acknowledged that this broad disciplinary reduction was one of the purposes of his book.

The evolution of the human brain explains contemporary problems of self.

Cozolino depicted a close relationship between brain and self, and he concluded that psychological problems are a disruption in how the brain facilitates the human experience of a coherent sense of self. In the following passage, he attributed many emotional and psychological problems to irrational thinking caused by human imagination.

With the expansion of the cerebral cortex and the emergence of imagination, we have become capable of being anxious about situations we will never experience. We can now worry about monsters living under our beds and the incineration of the earth resulting from the sun’s expansion. Because our imaginal capabilities

have allowed for the construction of the self, we can also become anxious about potential threats to our psychological survival. (p. 240)

In this passage Cozolino argued that imagination is a defining characteristic of selfhood and it is enabled by the complexity of the brain. This is one of the primary ways by which Cozolino linked brain and self, and he used that connection to describe many contemporary problems of self as products of imagination or irrational thinking caused by the brain. This was a remarkably reductionist and asocial vision of human self.

Psychopathology inhibits fitness or survival of the species. The following passage described the effects of childhood trauma using evolutionary rhetoric.

“When children are traumatized, abused, or neglected, they are taught that they are not among the chosen. They grow to have thoughts, states of mind, emotions, and immunological functions that are inconsistent with well-being, successful procreation, and long-term survival” (p. 206).

Some readers might overlook the association between phrases such as “successful procreation” and “long-term survival” as components of Darwinian theory because Cozolino insufficiently outlined evolutionary theory before applying it and referencing it in such a sweeping and connective way throughout his book. The implication that typical psychological functioning and wellbeing or the absence of psychological illness supports evolutionary theory is a rather scientized and limiting view of psychological health and illness that stands counter to a view of health and illness as social constructs which are certainly important for many Western cultures but not at all universal across human societies.

Psychotherapy emerged because of how the brain evolved. Cozolino argued that the brain evolved so as to develop in accordance with a person’s environment and the quality of relationships and is negatively affected by the developmental limitations in the

immature brain. According to his theory, early childhood development is formative for psychological health, yet because of the plasticity that the brain retains throughout the lifespan, change is possible after early childhood. This implied that psychotherapy happens to correct or heal difficulties that arise from these characteristics of the brain.

Many of our most important socioemotional learning experiences are organized and controlled by reflexes, behaviors, and emotions outside of our awareness and distorted by our immature brains. To a great extent, psychotherapy owes its existence to these artifacts of evolution and development. (p. 9)

Evolution's legacy is a complex brain, vulnerable to a variety of factors that can disrupt the growth and integration of important neural networks. The field of psychotherapy has emerged because of the brain's vulnerability to these developmental and environmental risks. (p. 11)

The human brain is an amazing organ, capable of continual growth and lifelong adaptation to an ever-changing array of challenges. Our understanding of how the brain accomplishes this mandate increases with each new theoretical development and technological advance. At the same time, we are uncovering some of natural selection's more problematic choices. If necessity is the mother of invention, then evolution itself has created the necessity for psychotherapy by shaping a brain that is vulnerable to a wide array of difficulties. (p. 306)

These ahistorical passages placed psychotherapy as a corrective intervention for natural problems caused by or manifested in the functioning of the human brain (see also *General history of psychotherapy according to Cozolino*, pp. 106-113). By explaining psychological difficulties as inevitable products of the brain, Cozolino implied that mental problems and disorders are ahistorical phenomena that would have appeared regardless of however else societies and cultures developed over the course of human history. This was a reductionist and scientized understanding of selfhood and problems of the self.

In sum, Cozolino used evolutionary theory to portray a relationship between the advancement of the human brain and the advancement of human societies, as well as the

emergence of culture and selfhood. He applied evolution as an all-encompassing theory that is able to link neuroscience and psychology generally, and mind and brain specifically, through materializing psychological problems and the curative mechanisms of psychotherapy. The passages above suggested that Cozolino used evolutionary theory to portray an ahistorical and scientific vision of human beings, culture, and psychology.

Synonymity and convergence between academic disciplines, areas of study, and types of human relationships. Another primary theme of Cozolino's book was the integration between various fields of study and human relationships. He positioned neuroscience research as evidence that neural functioning is the common underlying factor uniting disparate fields or social institutions that might otherwise be considered as fundamentally separate.

Reducing various fields of study to molecular biology. In the following passage Cozolino argued that molecular biology is the newest field of research that might unify a variety of psychological and medical disciplines by reducing the findings and practices of those disciplines to underlying gene expression that they each may actually be describing.

Research in psychoanalysis, epidemiology, developmental psychology, and psychiatry have all supported what we think of as common sense: A good childhood is better than a bad one; positive parental attention is important; and less stress early in life is a good thing. Of course, each field explains these findings from its own theoretical model and tends to see other perspectives as secondary. Recent research in molecular biology offers us a groundbreaking view into the underlying mechanism of the effects of early experience on genetic expression, that is, how early experience triggers gene expression to guide our brains onto particular adaptational trajectories. (p. 213)

With these statements Cozolino first criticized a number of fields of study for disregarding what he portrayed as equally valid points of other fields in regards to ideal qualities for childhood development. He then grouped all of those fields together and

argued that they are secondary to the study of how genetic predisposition and human experience interact to form the totality of a human being. Instead of integrating the epistemologies by broadening them to include an understanding of the larger cultural context in which they are all fighting for primacy, he reduced them all as secondary to the “underlying mechanisms” of gene expression researched by the field of molecular biology. Neuroscience, he proclaimed, is the master science. However, an assertion is not a solid argument.

Recent advances in mind-brain research suggest that psychology and neurology should be integrated into a single field as Freud intended. Earlier (pp. 107-110) I discussed how Cozolino claimed that psychology emerged from neurology because Freud (who first trained and practiced as a neurologist) was the founding psychoanalytic theorist. Cozolino identified the split between the two fields as having emerged when Freud gave up on his early interest in exploring a brain-based explanation for human cognition and psychopathology in favor of a theory of a nonmaterial mind after realizing that a mind-brain connection would have received little acceptance among the medical establishment, and would lack scientific evidence without the advances in neuroscience developed later in the 20th century (see *General history of psychotherapy according to Cozolino*, pp. 106-113). In those passages Cozolino asserted that the differences between psychology and neurology are artificial because the two fields both provide treatment for conditions that arise from the brain.

However exciting the goal of merging psychology and neurology may seem to some readers, the rationale underlying that vision was a historical inaccuracy about Freud’s intentions which, even if it was true, seems irrelevant to the tenuous argument

that self or mind is actually brain and therefore neurology and psychology should be combined even though each field serves extremely different yet significant purposes. The effect of advocating for an integration between the two fields was a further blurring between mind and brain. His advocacy for integration might just be a justification for how he does it.

Psychoanalytic theory, Buddhist philosophy, and neuroscience all reach the same conclusions. Cozolino asserted that Buddhist philosophy (which he identified as a personal longstanding interest) and psychoanalytic theory both contend that the perception of reality is illusory or highly subjective, even though it appears certain to individuals. He asserted that this area of convergence convergence is further supported by the findings of brain research.

Although controversial, the way in which the brain generates consciousness, including its many distortions, may have been subject to the pressures of natural selection. . . . You will soon see that the take-home message from psychoanalysis, Buddhism, and neuroscience is to be a skeptical consumer of the offerings of your mind. (pp. 133-134)

With this passage Cozolino posited that Buddhist philosophy and psychoanalytic theory share a common interpretation of the relationship between individual human life and the external world, and then he claimed that neuroscientific research explains and offers proof for why those two worldviews are both correct in valuing a skeptical outlook about the world. He also treats the mind as separate from the individual since it offers things to the “consumer.” This reinforces a view of self as an individual that has little control over his or her psychological experiences yet gains agency by learning that the findings of neuroscience confirm that reality is illusory, perceptions of truth are questionable, and identity is ultimately flexible. The use of neuroscience to support a

highly ideological view of reality presents possible philosophical contradictions between the alluring prospect of scientific objectivity and the assertion that a shared truth may ultimately be absent.

Using neuroscience to integrate psychotherapy theories. Earlier (pp. 121-126) I discussed Cozolino's use of neuroscience to promote what is called a common factors approach to psychotherapy. According to this integration, therapy tends to be effective when several core qualities or principles are all present. Cozolino argued that each of these common qualities or factors represents a specific type of neural integration, that is, a syncing or coordination between areas of the brain required for coherent psychological functioning and wellbeing. With his explanation of the purpose and efficacy of psychotherapy, Cozolino asserted that therapy utilizes the neurobiological property of neuroplasticity in a way that coincides with intended psychological change. In other words, therapy modalities facilitate the corresponding or underlying neural integration processes, as confirmed by the findings of recent neuroimaging studies used in mind-brain research. I discussed the ways in which this argument is reductionist and relies on neuroscience to resolve contentious debates in professional psychology about the standards of patient care and the best ways to assess of psychological healing.

Neuroscience provides psychotherapists with an explanation for how and why therapy is effective. The following two statements were exemplary of Cozolino's claim that neuroscience shows physical correlates for what had previously been assumed to be a nonmaterial or nonphysical psychological or relational process.

Social relationships have the power to stimulate the neural plasticity required for new learning. The interpersonal and emotional aspects of the therapeutic relationship, referred to as a *nonspecific factor* in the psychotherapy outcome

literature, may be the primary mechanism of therapeutic action. . . . These nonspecific factors are, in fact, quite specific, as early maternal care has been linked to increased neural plasticity, emotional regulation, and attachment behavior. (p. 38)

What is it that allows us to become self-aware, generate explanations, and modify long-standing ways of being? How do we expand conscious awareness in ways that allow us to change? Obviously, something has to change in the way our brains process information when we benefit from psychotherapy. (p. 140)

With these statements Cozolino positioned psychotherapy as a physiological restructuring that he claimed is observable through neuroimaging. He stated that “nonspecific factors” (p. 38) or the broad qualities necessary for successful therapy outcomes yet not necessarily tied to specific techniques or interventions are now measurable as brain changes that coincide with positive therapeutic results. In other words, by reducing therapeutic processes to brain functioning Cozolino believed he had provided a straightforward and concise explanation for an issue that has been the subject of much research and debate in psychotherapy. Earlier (p. 125) I discussed how this attempt at psychotherapy integration is simplistic, assumes that agreement is possible among competing psychotherapy scholars and their often-disparate approaches, and would furthermore require an uncritical acceptance of neuroscience as a true and unifying institution in psychology and psychotherapy.

Equating parenting and psychotherapy. Cozolino compared parenting and psychotherapy on the basis that each relationship alters gene expression in the same way.

“The idea that psychotherapy is a kind of reparenting may be more than a metaphor; it may be precisely what we are attempting to accomplish at the level of the epigenome” (p. 227).

Cozolino speculated that parents may influence the brains of children in a way that is identical to how therapists influence the brains of patients, thereby proving that

therapists re-parent patients. This was an example of reducing a cultural metaphor (and the moral discourse it represents about the origins of illness and healing) to a physical organ that has the capacity to recognize and respond to the qualities of ideal parents regardless of the unique purpose or boundaries of the relationship. In other words, Cozolino appealed to brain research as identifying the similar functions of valued societal institutions such as therapy and parenting. This exemplified how reductionism might overlook important cultural nuances in an effort to depict unique relationships as significant insofar as they use technical means to confer physiological change upon a person in times of growth or healing. This is also an understanding of psychotherapy as a process of re-parenting that infantilizes patients and draws from a romanticism philosophy that ideas such as innerness and authenticity, replicating an individualized view of self as extractable from its broader context and striving toward a knowable personal potential or ideal (see Sass, 1988).

In sum, Cozolino portrayed a convergence among various areas of study and concepts within those areas of study, and between types of human relationships. For example, he suggested that psychoanalytic theory, and theories of human development and psychopathology are all observations of genetic inheritance (and the environmental malleability of that biological predisposition). In his book he also argued that psychology and neurology should be reunited now that neuroimaging can evaluate the legitimacy of Freudian theory. Cozolino used neuroscience as the basis of psychotherapy integration, and he suggested that neuroscience confirms a highly subjective view of reality (he stated that psychoanalysis and Buddhism each value such a philosophical position). He also argued that psychotherapy leads to changes in patients' brains in ways that are similar to

how parents support healthy neural development in children. Throughout his book, these efforts at disciplinary integration often suggested reductionism of unique fields of study, and significant aspects of human development and experience, to the same material explanations or origins.

The brain as an inexact controller of perception. According to Cozolino, the human brain organizes and controls perception in accordance with what it learned about relationships and the world during early childhood. He explained that over the course of human history the brain evolved to function in this way, thereby making each person's experience of the world unique and based on personal biases or expectations even when individuals believe that they are experiencing an objective or truthful view of the world.

Despite the appearance of personal control and volition, the brain dictates individual functioning and experience of the world. Cozolino described how the brain evolved to exert a great deal of control over individual functioning. He also asserted that the brain has “hidden layers” that function outside of awareness and drive subjective psychological experience and functioning. In other words, he discussed the hidden layers of the brain as if they are the location of the unconscious mind—that is, they cannot be observed yet their existence can be ascertained by how they cause people to behave and think.

“Although we tend to think of our brains as processing information from the environment, the vast majority of the input to the cerebral cortex comes from what is already inside the brain” (p. 135).

“By now it is clear that our brains are in the business of constructing rather than conveying reality” (p. 138).

We actually live about 500 milliseconds after the moment and our past learning severely limits our free will. The illusion of free will and control have obvious

survival advantages, foremost of which is the ability to be assertive and confident in complex situations. (p. 313)

This projection onto the screen of our Cartesian theater is actually generated within the hidden layers of our neural architecture prior to conscious awareness. This leads us to assume that the world of our experience and the objective world are one and the same. We also tend to believe that we have all the necessary information we need to make choices. In truth, we often have little or no access to the information or logic upon which we base our decisions. (p. 135)

These passages were all exemplary of Cozolino's claim that humans are generally under the control of the brain while remaining under the "illusion" that they have volition or "free will." In these passages Cozolino explained that an individual's brain makes decisions without his or her input. For example, his claim that "the illusion of free will and control have obvious survival advantages, foremost of which is the ability to be assertive and confident in complex situations" (p. 313) implied that brains deceive individuals (rather than individuals deceiving themselves) in order to adapt to stressful situations and perform tasks well under pressure. From this premise it would seem that learning about the brain is a necessary step in a process of regaining a sense of control or self-directedness. His assertions draw from a vision of self that is consistent with the problems of the "ghost in the machine" (Ryle, 1949); it is an attempt to overcome the Cartesian illusion by materializing the mind, which requires taking for granted the compartmentalized view of personhood and the personification of the brain as the source of human beings that this materializing and localizing of self necessarily requires. This appears to be a form of cognitivism (which is common to many psychotherapy theories; see Cushman, 1995) although it is at once dressed up and justified by neuroscience. The implication is that we must take control over our lives by taking control over our brains. The implications of the use of personification in these passages is a good example of

Vidal's (2009) argument that even when neuroscientific literature states an objection to reducing mind or self to brain, personification of the brain often implies mind-brain reductionism anyway—not only of mind to brain, but also a reduction of psychology to neuroscience. For example, since the hidden layers of the brain were suggested to be the source of the Freudian unconscious, the concept of the unconscious mind might be inferred to be a historical placeholder for a neurobiological concept rather than an corresponding location (or an alternative explanation) for it. As I discussed earlier (see *Aporia*, pp. 178-182), Cozolino briefly acknowledged this important issue, and then he responded by abdicating responsibility as the author for how readers might interpret his text.

Cozolino's concept of hidden layers mapped unconscious experience onto the human brain, and this warrants some discussion. He stated that the hidden layers organize experience outside of individual awareness and therefore produce defenses that emerge spontaneously, thereby causing disorganized and immature reactions to distress, which then impairs psychosocial functioning. In other words, as therapists we recognize the workings of the hidden layers by observing how patients adapt, cope, and function, but it was unclear whether Cozolino intended to imply that these neural layers are hidden because they are unobservable by current neuroimaging techniques, or whether they are hidden from humans yet observed by neuroimaging. Regardless, with this concept Cozolino established a reason for individuals to be skeptical of what they think is reality, yet he also encouraged readers to trust that the functioning of the brain is the reason why that skepticism or uncertainty is warranted. This is a disguised ideology or moral discourse. Cozolino valorized an attitude of skepticism about the external material world

(which would seemingly suggest a loss of self-directedness or personal control), and then he implied that a person may regain that control over his or her life because the amount of freedom or agency that individuals possess may be ascertained by learning about the internal physical location of that control and recognizing how to influence and change it. In this view one way to change the hidden layers is through psychotherapy, which I discuss in the following subsection.

The therapeutic correction to the distortions of the hidden layers of neural processing. Cozolino explained psychotherapy as a process that corrects problems caused by the brain by counteracting the brain's decisions and reorganizing its functioning.

Based on observations of all levels of the client's behavior, the therapist attempts to bring the processing of the hidden layers to the client's attention. Repeated and skillful attention to unconscious material via interpretations, confrontations, and clarifications results in a gradually expanded awareness of unconscious processes and the integration of dissociated top-down and right-left processing networks. (p. 35)

Most forms of psychotherapy attempt to shine the light of conscious awareness on belief perseverance and attribution biases, and undermine the conservative nature of the hidden layers. Others engage in a deep exploration of the dynamic unconscious, defenses, and primitive emotional states. By encouraging clients to be open to new ideas, explore the connections within their hidden layers, and take responsibility for positive change, we challenge them to reorganize the neural networks of their hidden layers. (p. 138)

Once we wake up to how our brains work, what do we do? How can we overcome or at least cope with our distortions, impulses, and unconscious drives in constructive and healthy ways? Fortunately, our brains contain structures and networks that allow us to counteract some of the hidden layers. (pp. 138-139)

In these passages Cozolino described therapy as a means of coping with and counteracting the brain. This was suggestive of cognitivism. Since he equated the material brain with the psychological mind, his theory is an extraordinary effort at reductionism. Cozolino argued that patients must remain open to new ways of thinking

and take responsibility for changing, and through those steps patients alter the functioning of their brains in ways that makes these changes permanent. This is similar to an early modern era understanding of madness and sanity (see Cushman, 1995; Foucault, 1961/1988; Scull, 1975) and it fails to explain how humans are to think rationally in order to doubt the reality produced by the brain if it is through the brain that humans think. As I discussed earlier (see *Aporia*, pp. 178-182), Cozolino explicitly acknowledged this problem but refused to even address it, thereby raising doubts about the purpose and meaningfulness of the entire text. It hints at the disguised ideology of skepticism or doubt about the external material world.

Neurobiological functioning explains many typical human experiences.

Cozolino provided numerous examples of neuroscientific explanations for how humans commonly think, act, and talk about themselves and the world.

For example, Cozolino described the game Simon Says, and the neurophysiological systems needed to participate in it, by noting, “The popularity of this game reflects the development of these systems as well as a way to exercise voluntary control over impulses” (p. 130). Cozolino linked the psychological experience (“popularity”) of a common children’s activity to the development stage at which they are able to participate in it. Of note, it was unclear how the popularity of a children’s game (rather than the ability of children to perform the tasks required for it) reflects neurophysiological development.

The brain’s ability to take our physical experience and use it metaphorically is the basis of imagination. For example, jumping down a slide may serve as a sensory-motor metaphor for falling in love. The child’s experience of emerging from under the covers into the light of day provides a metaphor for religious enlightenment later in life. The balance provided by the vestibular system may be

the model for psychological and emotional stability, and ultimately for leading a more balanced life (Frick, 1982). Physical metaphors provide a contextual grounding in time and space that helps us grasp our experience and may serve as an infrastructure of higher cognitive processes. (Cozolino, 2010, pp. 146-147)

This passage exemplified Cozolino's argument that cultural traditions and shared descriptions of them emanate from certain desires or intentions of the brain itself, which people happen to have in common because of the way the brain evolved over the history of the species. In the passage above, Cozolino asserted that the brain recognizes when certain meaningful human experiences (such as falling in love or having a spiritual awakening) produce similar feelings as certain physical sensations, and then it decides to compare the physical and psychological experiences using the figure of speech of metaphor. Because members of a society share colloquial or idiomatic expressions (and therefore share the moral understandings that are implicated in those cultural expressions), the passage naturalized those values and discourses by identifying them as products of the material world that are produced by the brain in order to coordinate bodily processes. The passage was noteworthy because it illustrates how the reduction of mind to brain can lead to an individualized material reduction of the social or shared understanding of the good. This a good example of how the use of evolutionary theory and neuroscience to explain social traditions seems to primarily reinforce a modern era understanding of the self as a detached, private, and somatic individual.

“Most of us have felt the firing of these familiarity circuits in an exaggerated form when we unexpectedly run into a friend in an unusual place” (p. 153).

In this passage Cozolino described the feeling of familiarity or recognition of other people as the experience of having “felt” the neurobiological process that is

believed to correspond or coincide with that social experience. Cozolino rewrote an important yet typical human experience in terms of neurobiology.

“Many new mothers report an increasing need during the first year to get out into the world of adults or back to work. This need may parallel a shift back to previous levels of left-right hemisphere balance” (p. 190).

This brain-based explanation for why women often find themselves returning to work soon after childbirth was quite surprising. By depoliticizing this issue Cozolino entirely overlooked the broader political and economic issues related to inadequate workers’ rights and family services that have been associated with this issue. Further, it was also unclear how new mothers are removed from “the world of adults” simply because they have spent time with an infant. Yet it is characteristic of his overall strategy of naturalizing cultural phenomena by attributing them to common neurobiological functioning (in this case neurobiological functioning that is assumed to be gender specific), thereby implying that typical experiences such as these are evidence that the behavior is generally desirable (rather than compulsory by economic circumstances or cultural prescriptions), controlled by brain functioning, and somehow present across cultures and historical periods. This passage was important because it illustrated an overreach by Cozolino in his use of neuroscience to explain this particular trend as somehow natural, ahistorical, and apolitical.

To summarize, a main premise of Cozolino’s book is that the brain exerts a great deal of control over behavior and conscious experience, and therefore individual volition and agency are more illusory than they might seem. He used this foundation to describe how psychotherapy allows individuals to regain self-directedness by exerting influence over the brain’s engrained processing. This implies that without neuroscientific research,

humans would be unaware of whether valued beliefs about freedom and agency actually exist. He also reduced cultural phenomena to brain functioning, thereby removing customs and social norms from their broader historical traditions and shared context. I showed one noteworthy example of how this type of thinking led Cozolino to the apolitical conclusion that many women currently return to work following childbirth because of the natural needs of their brains, rather than economic conditions or public policy.

Integration. Cozolino described various types of integration, ranging from mind-body integration to various examples of the integration of psychotherapy theories.

Mind-body integration via the brain. Cozolino frequently described the integration or convergence of physical and psychological aspects of human life through the integration of their corresponding neural correlates.

“A therapist attempts to restructure neural architecture in the service of more adaptive behavior, cognition, and emotion” (p. 9)

“Healthy functioning requires proper development and functioning of neural networks organizing conscious awareness, behavior, emotion, and sensation” (p. 21).

These top-down networks provide the pathways for inhibiting reflexes and bringing the body and emotions under increasing cortical control. . . Thus, a vital aspect of the development of the cortex is inhibitory—first of reflexes, later of spontaneous movements and even later of emotions and inappropriate social behavior. (p. 69).

“Cells in the parietal lobes respond to hand position, eye movement, words, motivational relevance, body position, and other factors relevant to the integration of experience” (p. 100).

“The learning of these skills in therapy occurs in the context of emotional and cognitive integration, requiring the participation of both hemispheres, reflective language, feelings, sensations, and behaviors” (p. 111).

These statements illustrated how Cozolino portrayed various aspects of human psychology and physiology as converging within the human brain in ways that allow for a coherent experience of objective reality and self-control over physical and emotional functioning. Further, he implied that because of this convergence within the brain, psychological and physiological aspects of experience are inextricable during typical functioning. This explanation of the connection between mind and body through the brain is similar to early modern era theory that stressed the importance of rationality over emotion (see Cushman, 1995; Taylor, 1989). Therefore, Cozolino's descriptions of the brain as the source of cognitive and emotional coordination are indicative of an underlying moral discourse about standards of normativity and the best way of life.

The co-occurrence of neural integration and psychological integration. The following passages exemplified how Cozolino described psychological integration as the observable manifestation of neural integration.

A basic assumption of both neuroscience and psychotherapy is that optimal functioning and mental health are related to increasingly advanced levels of growth, integration, and complexity. On a neurological level, this equates to the integration and communication of neural networks dedicated to emotion, cognition, sensation, and behavior and a proper balance between excitation and inhibition. On an experiential level, integration is the ability to live life—love and work—while employing a minimum of defensiveness. (p. 25)

“Ultimately, psychological, interpersonal, and neural integration are different levels and manifestations of the same process” (p. 43).

“The three nonsecure patterns of attachment research all reflect lower levels of psychological and neurological integration” (p. 205).

With these statements Cozolino implied that psychological integration and neural integration are processes that are inseparable, because psychological integration is the experience that results from neural integration. These statements also suggested that both

types of integration described the extent of typical functioning and therefore may be used interchangeably. In the third statement above, psychopathology was portrayed as a breakdown or deficiency in the integration of both psychological and neurobiological realms although it is commonly described as insecure attachment (see also *The definition and etiology of psychopathology*, pp. 132-135). The use of the concept of integration to describe both psychological and neurological functioning was central to Cozolino's theory and illustrative of the use of rhetoric to portray concepts with a possible relationship as closely related and even alternate descriptions of the same objective truth or reality.

Human experiences and relationships shape neurobiology and contribute to health and wellbeing. These passages exemplified how Cozolino described human experience as tangibly represented by how they impact the brain or its early development.

“You could also think of our neural architecture as a tangible expression of our learning history” (p. 19).

“So as we show affection and kindness to our children, we may be building more resilient brains, an expression of genetic variation” (p. 218).

“Perhaps caring for our children and grandchildren may be more supportive of health and longevity than cholesterol medication and treadmills” (p. 226)

These statements illustrated how Cozolino depicted the brain as the materialization of human experience. For example, with the first statement above, he described a person's learning history as “tangible” through how this history shapes the brain. The second and third statements above exemplified his argument that the experiences of family life can be useful for maximizing the genetic potential for brain health or other biomedical indicators of wellbeing. These types of statements suggested

an attempt to overcome the mind-body problem by identifying ways in which personal history and seemingly nonmaterial experiences manifest as observable physiological changes. Despite the relatively recent emergence of remarkable scientific advancements, the underlying focus on finding scientific (especially neuroscientific) evidence for how individuals are connected to a broader context (and to each other) personifies brain functioning and replicates mind-brain dualism instead of providing an alternative to Cartesian philosophy (Bennett & Hacker, 2003). In their critiques of the logic of cognitive neuroscience or mind-brain research, scholars (e.g., I. Gold & Stoljar, 1999; Noë, 2009; Tallis, 2011) have argued that the portrayal of neuroscience as a revolutionary endeavor that disproves dualism overlooks how an assumed relationship between mind or self and brain has in fact been a hallmark of Western culture for many centuries, while the excitement generated by neuroscientific research and technologies masks the flawed logic that underlies much of the research seeking to explain conscious experience in terms of its neural correlates.

Psychotherapy theory integration via neuroscience. Earlier (see pp. 121-127) I discussed how Cozolino portrayed neuroscience as a field of study that can transcend the differences between psychotherapy theories by explaining how effective psychological treatments all enable neural integration. I also showed (see p. 126) how his use of brain science to validate this common factors approach to psychotherapy assumed both an uncritical stance toward neuroscience, as well as a belief that competing therapy theories will easily surrender their differences in favor of adopting a new explanation for the effectiveness of therapy and the best ways to measure that efficacy.

Throughout Cozolino's book, integration was a primary theme. Aside from the disciplinary integration between neuroscience and psychotherapy, he also used neuroscience to integrate psychotherapy theories on the basis of their common factors or shared aspects that explain the efficacy of various treatment approaches. Further, through these disciplinary integrations, he integrated psychological concepts with brain functioning, thereby linking mind and brain or mind and body. The use of neuroscience to resolve the Cartesian split or explain the connection between individuals and their broader context reinforces dualism by personifying the brain and assuming a need to find scientific evidence to contradict the idea of a mind-body split.

The progression of neuroscience. Cozolino supported a socially-minded yet personally applicable interpretation of neuroscience through his taken-for-granted belief in the inevitability of progressive achievements in science.

The transition from neuroscience to social neuroscience. Cozolino discussed the late-20th century transition within the field of neuroscience from its use of neuroimaging to study the neural correlates of individual behavior to its use of neuroimaging to study social behaviors.

“The notion of the brain as a social organ emerged in neuroscience during the 1970s as animal researchers slowly began to appreciate that neuroanatomy, neurochemistry, and social relationships are inextricably woven” (p. 178).

Lessons learned during a century of dynamic psychotherapy may have important neuroscientific implications. The most basic is that we are born into relationships and come to our individual identity while resting upon social connectivity. Another is that social interactions affect everything from our biology to our intellectual abilities. Neuroscience researchers are slowly coming to the realization that the scope of their scientific observation needs to expand to include relationships. (pp. 178-179)

In this passage Cozolino praised the field of social neuroscience and he supported a continued effort within neuroscience to continue its research in this direction. He also argued that psychotherapy theories have described a social emergence of selfhood and therefore those theories have unknowingly described a social brain. In this passage the reduction of psychology to neuroscience leads to a reduction of social selfhood as important insofar as its effects on biology are measured. The use of a material or physical location of self to explain the emergence of human communication and interconnectedness might be fundamentally incompatible with the idea of a social or relational self that it purportedly proves because this vision emphasizes a somatic individual self defined by a materialized inner world.

Individuals or groups of individuals can impact the paradigms of neuroscience research. In the following passage Cozolino suggested that one role for therapists, parents, and teachers is to advocate for interpretations of neuroscience research that focus on human interdependence.

Relationships are our natural habitat, while the isolated brain is an abstract concept. Thus, understanding the brain requires knowledge of the person embedded within a community of others. Therapists, teachers, and parents intuitively grasp this profound reality just as laboratory scientists often do not. We are now in a position to help research scientists know where to look as they explore how the brain grows, learns, and changes throughout life. (p. 179)

In this passage, Cozolino suggested a role for parents, teachers, and therapists as advocates for directing brain research toward an understanding of how humans are interconnected and dependent upon each other, especially during periods of learning, personal growth, healing, and early development. He described parenting, education, and psychotherapy as tasks or roles that have resulted from personal intuition, rather than

social institutions or shared traditions that have emerged over many centuries. This reduction of traditional social roles to intuition appears to justify his implication that such intuition is now able to initiate hard science research that will determine definitively and objectively what is and is not real. His claim that therapists and other nonscientists can now contribute to the work of higher-order scientific research might generate excitement that the value of non-scientific endeavors will be demonstrated by science, but it ultimately serves to mask the disciplinary reductionism in the passage.

In this passage it is also noteworthy how Cozolino switched back and forth between descriptions of social experiences and descriptions of the brain, thereby portraying brains instead of people as the entities that are either thought to be isolated or social. The passage builds to a conclusion that brains learn, grow, and change. The reduction of mind or self to brain that results from the rhetorical device of personification in this passage further reinforces a reduction of cultural institutions such as therapy and parenting to neuroscience under the guise that therapists, teachers, and parents could help broaden neuroscience and reverse its reductionist tendencies. Finally, it was unclear how exactly therapists and other nonscientists might go about participating in this progressive neuroscientific movement. Readers might simply be left with feelings of excitement or gratitude that Cozolino advocated for finding neuroscientific evidence for why teachers, parents, and therapists exist. Or, readers might be inspired to talk about neuroscience and the brain more in their daily life or careers. Regardless, the passage perpetuates an understanding of self as brain.

Personalizing neuroscience. In some passages Cozolino discussed how his knowledge about neuroscience has impacted his understanding of his own thinking and behavior.

For example, in the following passage Cozolino described how he used his understanding of brain functioning in order to understand why people habituate to patterns and are unable to perform random behaviors.

I remember being surprised to find a table of random numbers in an appendix of my college statistics textbook. . . . This finally makes sense to me based on neural network organization: We are unable to engage in random actions because our behaviors are guided by patterns established through previous learning to which we automatically return. (p. 16)

In the above example Cozolino identified the predictability of human beings as the habituation of the brain to early experiences. In the following passage Cozolino described his insight into the origins of his struggle with dieting as an adult, and how this struggle resulted from what his brain had learned when he was a child.

I was a young boy of 5 or 6 standing in my grandmother's kitchen and had just expressed being upset about something. . . . Without saying a word she pivoted around, opened the freezer, took out a large box of Neapolitan ice cream. . . . There was no memory of discussing how I felt. Whatever bad feelings I may have been having quickly dissolved in a haze of glucose. The similarity of this memory to my experience in my adult life was striking. My hidden layers had learned a pattern—feel tired, sad, stressed, or disappointed; get lots of calories; watch TV; and the feelings pass. (p. 139)

In this passage Cozolino attributed his ongoing dieting failures to his grandmother's use of food to soothe him during childhood. However, rather than presenting this interpretation as a solely psychological or behavioral cycle, he posited that his brain had learned a pattern that became permanent until he gained insight into the origins of the behaviors. In the following passage Cozolino recalled a childhood

experience that he identified as essential to the development of self, and he speculated that the parietal lobes were significant in that process.

As a child I had an imaginary retreat. I would close my eyes and picture the back of my grandmother's closet, always piled high with shoe boxes. Behind these boxes was a hidden door just large enough for me (but not an adult) to squeeze through. . . . This was a safe place for me—quiet and private—where I could imagine other worlds, reflect on life, and fantasize about the future. The evolution and expansion of the parietal lobes were likely essential to the emergence of this kind of imaginal self. (p. 146)

In this passage Cozolino demonstrated his understanding of Winnicottian theory by using it to understand his own psychological development and emergence of self during his childhood. He then concluded that the parietal lobes of the human brain facilitated the development of self in the way described by psychoanalytic theory. In the following passage Cozolino demonstrated his brain-based understanding of a startle response.

I walked into my garage one day to look for a tool when, out of the corner of my eye, I saw a small brown object near my foot. . . . I immediately jumped back, my heart rate increased, my eyes widened, and I became tense, ready to act. . . . My peripheral vision saw the object and my amygdala appraised it in an overgeneralized fashion to be a threat. My amygdala activated a variety of sympathetic responses including startle, increased respiration, and avoidance. (p. 244).

While there are obviously physiological processes occurring during experiences such as the abrupt scare that Cozolino recalled above, he demonstrated a rather scientized and reductionist understanding of self and behavior.

By explaining personal experiences in terms of the physiology and neurobiology correlated with those experiences, Cozolino used the narratives above to illustrate the relevance of neuroscience for explaining common human behaviors and daily life. His statements also implied that his book was an endeavor born from his life experiences and

personal interests, and exemplified how he incorporated neuroscience into those personal interests.

Criticism of reductionism and other tenets of Western science. In some brief passages Cozolino criticized reductionism in neuroscience and the use of scientific approaches for solving human problems.

For example, in the following statement Cozolino criticized the lack of appreciation for how psychological wellbeing may aid in improving physical wellbeing.

“Perhaps caring for our children and grandchildren may be more supportive of health and longevity than cholesterol medication and treadmills” (p. 226).

With that statement Cozolino leveled a fair criticism against individuality and loss of close familial bonds in the United States. He then supported that criticism with claims that spending time with family can positively impact physiological wellbeing and biomedical indicators of health or disease prevention. Cozolino’s argument placed cholesterol medicine and exercise equipment alongside time spent with family as equally viable healthcare options. He furthermore overlooked the paradox of viewing social interactions as valuable for strengthening individual health, since a concern for individual enhancement could undermine the priority of social good and family commitment. In other words, there is a worthwhile argument that spending time with family solely for the purpose of trying to lower one’s blood cholesterol might inadvertently subvert the sense of history and tradition that contribute to the sustainability of the institution of family. In other words, Cozolino’s argument is built on a contradiction.

In the following passage Cozolino criticized the scientific method for using individuals rather than relationships as its unit of analysis.

Despite the fact that our brains are social organs, Western science studies each individual as a single, isolated organism rather than one embedded within the human community. This way of thinking leads us in the West to search for technical and abstract answers to human problems instead of looking at day-to-day human interactions. Take, for example, how physicians responded to the high mortality rate among children in orphanages during the last century. Assuming that microorganisms were to blame, they separated children from one another and ordered their handling to be kept to a minimum It was not until children were held and played with by consistent caretakers and allowed to interact with one another that their survival rate improved. (Blum, 2002, as cited in Cozolino 2010, p. 178)

In this passage Cozolino began by asserting that humans cannot be scientifically studied in isolation because the human brain is a social organ (in his book he identified the brain as intrinsically seeking attachment relationships and social interactions, especially during the formative early childhood years). This was an example of using a philosophical claim about the nature of human selfhood as an interpretation of natural brain functioning. He then criticized the effects of a scientific understanding of human life by proving an example of children who died from lack of attention when it was wrongly assumed that they were dying from a contagious disease. He suggested a relationship between interpersonal human experience and physical wellbeing using evidence that children had died from lack of care rather than physical disease, which itself seems to be a scientized understanding of that tragedy. Cozolino was correct to caution about the effects of using the scientific method as a model to study human interrelatedness and subjective experience. However, rather than proposing a way to study relational selfhood that is extricated from the scientific method, he seemed to advocate instead for a revised science that studies the effects of social relationships on physical health (and elsewhere he praised the efforts of social neuroscience). Throughout his book, regardless of whether he was advocating for either scientists to change their

thinking, or therapists and general audiences to interpret neuroscience findings in a more progressive or contextual way to support human science theories, the option to question entirely the helpfulness of brain-based understandings of self was never an option.

In the following passage, Cozolino challenged the comparison between the brain and technology, asserting that the brain creates reality (often problematically) whereas technology functions in accordance with human demands and has no volition.

By now it is clear that our brains are in the business of constructing rather than conveying reality. This perspective is in sharp contrast to the modern Western notion of the brain as a combination camera, tape recorder, and computer. If our electronic equipment really did function like our brains, we would replace them at the first opportunity. (p. 138)

It was noteworthy that Cozolino decried the comparison between the brain and electronic equipment despite his frequent use of metaphors for the brain that suggested that the brain is very much like an electronic device, albeit an electronic device with a volition or will of its own (see *Metaphor*, pp. 206-209). The passage above actually suggested a criticism of the brain itself for causing misinterpretations, irrational beliefs, and distorted perceptions (see also *Personification*, pp. 209-211, and my discussion of the implications of this rhetorical strategy for the understanding of human selfhood).

Criticism of reducing psychological symptoms to single brain structures. In some passages Cozolino criticized the reduction of psychological symptoms to single brain regions or processes and advocated instead for an understanding that symptoms are caused by multiple and interacting processes in the brain.

Due to the interconnectivity between left-right and top-down neural networks, examining integration from either the vertical or horizontal dimension alone is overly simplistic. Studies of metabolic activity in specific areas of the brain in pathological states reveal differences in both cortical and subcortical structures on both sides of the brain. (p. 28)

The common explanation from psychiatrists to parents is that their children have a lag in frontal lobe development that results in a disinhibition of impulses from lower in the brain and difficulties with tasks that require sustained attention... while this is a good anecdotal explanation, the underlying mechanisms and etiology of ADHD are likely much more complicated. Functional imaging research comparing ADHD to non-ADHD subjects reveals a variety of patterns of higher and lower levels of activation throughout the brain. (pp. 129-130)

These statements were noteworthy because Cozolino's initial tone or attitude in these passages suggested a criticism of reductionist thinking, yet he attempted to overcome reductionism with only a broader view of the human brain that still suggested that it is the location of psychological symptoms or disorders.

In his portrayal of the relevance and applicability of neuroscience, Cozolino described neuroscience as a field that accurately studies the origins of social phenomena, and he portrayed non-scientists as possible contributors to this exciting endeavor. Cozolino demonstrated this participation by applying descriptions of neurobiology to his own insights about his early development, daily behaviors, and understandings of human nature. Further, in his descriptions of how human physicality and wellbeing are connected to broader social factors, he portrayed neuroscience as a field that counters the problems caused by Western individualism and the scientism valued in this way of life. I noted how materializing psychological and sociological concepts onto the brain—an organ residing within each individual—may in fact reinforce rather than challenge the social concerns he raised.

Summary of themes. Throughout Cozolino's text, major themes included the use of evolutionary theory as a central principle for his mind-brain and psychology-neuroscience integration efforts, synonymity and convergence between academic

disciplines and human relationships, the brain as a controller of human experience and psychology, integration (e.g., mind-brain integration and psychotherapy integration), and the progression of neuroscience whereby brain research has recently become concerned with issues related to social psychology, and can be influenced, interpreted, and applied by non-scientists, and serves as a field that can actually counter the problems of Western individualism and scientism.

Cozolino's use of evolutionary theory to explain human culture and society, and to reduce psychology to physiological processes, is a controversial and problematic premise because it individualizes and scientizes cultural and historical phenomena, including selfhood. His use of neuroscience to integrate fields of study is a form of reductionism that overlooks the social and historical significance of unique areas of knowledge and cultural institutions. His understanding of the brain as the controller of human experience challenged the existence of subjectivity and agency before he restored those important aspects of humans by implying that by learning about the brain humans can learn how to gain control over it. His integration of mind and brain either posited brain functioning as the source of human social interactions, or portrayed social interactions as valuable because of their effects on the individual brain. Both conclusions imply an a priori individualism rather than an a priori shared context into which individuals are born and develop together. Using mind-brain research to advocate for a more contextual rather than narrow scientific approach reinforces rather than adequately challenges the supremacy of science as a way of explaining human life or psychology. Cozolino's efforts suggest a reduction of psychology to neuroscience.

Summary

In this chapter I presented the primary content, rhetorical strategies, and major themes of Louis Cozolino's (2010) *The Neuroscience of Psychotherapy: Healing the Social Brain*. In the next chapter I conclude my research project with a discussion of the content, rhetoric, and themes in Cozolino's book in light of the historical and cultural circumstances from which the book emerged, and the understandings of self that a psychotherapy discourse based on his book might perpetuate.

Chapter V: Discussion

In this Chapter I conclude my hermeneutic research project by discussing the primary content, rhetorical strategies, and themes in Louis Cozolino's (2010) *The Neuroscience of Psychotherapy: Healing the Social Brain* in light of the cultural and historical trends from which the integration between neuroscience and psychotherapy emerged, which I described in Chapters I and II. The purpose of this discussion is to identify the understanding of self that a therapy discourse based on Cozolino's text might unknowingly reflect and perpetuate.

Summary of Results Chapter

In Chapter IV I laid out the primary content, rhetorical strategies, and recurring themes in Cozolino's (2010) book. I discussed the primary content of his text in three general sections: In the outline and background section of Chapter IV I summarized the six parts of the book and I discussed Cozolino's understanding of the historical origins of psychotherapy, the place of his text within the history of psychotherapy, typical psychotherapy theories, and differences between his theory and other theories. Cozolino described his efforts as a return to Freud's original intentions of delineating brain-behavior relationships now that neuroimaging has advanced to a point that allows for describing Freud's psychoanalytic theory of mind according to its neural correlates. I argued that Cozolino's understanding of the history of psychotherapy was an origin myth that he used to validate a reductionist mind-brain theory using a broader reduction of human psychology to neurobiology.

In the second primary content section of Chapter IV I laid out the tenets of Cozolino's psychotherapy theory (see pp. 127-164). According to Cozolino,

psychotherapy is an intervention that is curative to the extent that it fosters neural integration or proper flow and balance between brain regions. He asserted that neural integration is an indicator of healthy psychological functioning, and therefore all problems for which patients seek psychotherapy—from severe psychopathology to general life concerns that are not symptoms of serious mental illness—are products of inadequate neural integration (he acknowledged that neural bases for general life concerns that are not the result of mental disorders have yet to be studied using brain imaging). Cozolino primarily used the concepts of self and mind as ways to describe brain functioning. For example, he mapped a psychoanalytic (primarily Winnicottian) understanding of self as a product of neural development and functioning. It was unclear how he defined the concept of mind (which he used infrequently) and therefore his use of that concept was vague and confusing. His infrequent and unclear use of the concept of mind portrayed that hallmark psychological concept as antiquated and better understood as the behaviors and experiences produced by individual brain functioning. According to Cozolino, the extent to which psychological treatments are effective is understood to be reflective of the extent to which these treatments activate neural plasticity (the ability of the brain to change according to experience and environment) in a way that fosters neural integration. He seemed to imply a correlation between human volition and brain functioning (rather than asserting a directionality between mind and brain) but his use of language was often vague, as I discuss further below. In his account the brain evolved to be responsive to the qualities that are central in effective psychotherapies. Those qualities include the use of narrative or language in a secure attachment relationship based on a combination of supporting and challenging patients.

Cozolino described a variety of indicators of successful psychotherapy that included symptom reduction, affect regulation, and ego strength or the use of higher-order defenses. His primary content suggested that he attempted to integrate a wide array of psychotherapy theories and concepts by subsuming them all under a neurobiological understandings of self, illness, and healing methods.

Cozolino's (2010) text was suggestive of materialist reductionism justified by a misunderstanding of the historical emergence and cultural relevance of psychological concepts. According to Cozolino, the brain controls human experience and therefore must be influenced or changed in order for individuals to gain agency or self-directedness. His brain-based psychotherapy theory assumed that the concept of personhood is comprised of separate mental and physical aspects, and therefore it reinforces rather than resolves Cartesian dualism.

I also discussed two case vignettes from Cozolino's text that illustrated some of his recurring treatment suggestions, understandings of the origins of psychological difficulties, and ways in which psychotherapists foster psychological change with patients. In the first vignette I reviewed, Cozolino referenced his use of a Winnicottian developmental scheme to suggest that his patient, Sandy, needed to spend time coping alone and developing a safe, "internal" place to turn to in order to cope with mood swings. With Sandy, Cozolino also focused on behavioral changes based on a tenuous behavior cycle related to recurring sinus infections rather than work, family, or social difficulties. In the second case vignette Cozolino described his treatment for a Holocaust survivor suffering from trauma-related anxiety. Cozolino used a creative role-play intervention that portrayed the traumas of being a member of a persecuted minority

religious group as a set of isolated curable symptoms able to be relieved by imagining a different personal history. I noticed that in both cases Cozolino's approach focused on teaching new and creative ways of thinking and talking about patients' lives and symptoms based on brain changes. In both cases it was unclear why he avoided any relational or depth-oriented conceptualization or treatment approach. He justified his approaches with neurobiological evidence of how the brain changes in response to altering memories, yet was unclear how he decided upon the specific interventions that he implemented. Cozolino's approaches seemed eclectic, reductionist, and decontextualized.

After my descriptions and interpretations of Cozolino's (2010) primary content and psychotherapy case vignettes, I examined his use of rhetorical strategies, especially in his portrayals of relationships between brain functioning and psychological experience. I categorized these strategies under ambiguity (unclear statements that could be interpreted in two or more ways), analogy (logical comparisons concerning relationships between concepts or entities), aporia (statements in which Cozolino acknowledged doubt about a premise or purpose of his entire book), diction (word choice), epigraph (quotes preceding the start of each chapter and subsection), and figures of speech which included apposition (the use of a noun to modify another noun), metaphor (a comparison between concepts or entities without using the words like or as), personification (attributing human characteristics to nonhuman yet physical entities), and prosopopoeia (personification of nonmaterial concepts). Cozolino used these strategies to portray relationships or synonymy between brain functioning and psychological experience, and more generally between neuroscience and psychology. These strategies furthered a material reductionism of mind to brain while obfuscating historical and epistemological

differences between psychology and neuroscience. Later in this chapter I devote a section to discussing his use of these strategies and their significance at greater length (see p. 255).

Finally, I identified some of the recurring themes contained in Cozolino's (2010) book. The central organizing principle of Cozolino's text was the theory of evolution, which Cozolino used to explain human psychology, culture, and societies as resulting from how the brain developed throughout the history of the human species (see *Cozolino's Thesis* below). I also identified as another theme Cozolino's brain-based attempt to integrate various disciplines, fields of study, and human relationships. Another theme was Cozolino's portrayal of the brain as a distorted and biased controller of individual beliefs and perceptions. Cozolino used this theme to describe how psychotherapy offers the potential for regaining control over the brain. I identified the progression of neuroscience as one of Cozolino's major themes, which he portrayed by including several brain-based accounts of his personal history such as his early psychological development as a child, typical behaviors as an adult, insights about human psychology generally, and insights about the origins of his own behaviors he has tried to change.

Cozolino's Thesis

The central argument in Cozolino's (2010) book is that neuroscience is the true or master science for revealing the origins of human culture, society, and psychological experience because recent advances in neuroimaging reveal (or have the potential to reveal) the neural structures and functions that have evolved to produce all individual and social phenomena. According to his thesis, psychology and psychotherapy are institutions

whose emergence was inevitable because of the contemporary problems and solutions that the brain evolved to produce and heal. Because the brain is the material source of all human experience, the brain is the source of personal difficulties ranging from general life stressors to serious mental illness. However, evolution also resulted in a brain that retains throughout the lifespan the ability to be influenced by relationships and other experiences. This confers upon individuals the potential for psychological healing and personal change. Since neuroscience is the master science, it confirms or validates the accuracy of psychoanalytic and other therapy theories that happen to share an established efficacy for reducing or eliminating psychological symptoms.

Historical Support for the Thesis

Cozolino (2010) argued that neuroscience is the true science and the brain is the true source of human personhood. He supported his thesis with the argument that therapy theories—with their understandings of self, illness, and psychological healing—have been historical placeholders for neurobiological descriptions of human experience. He claimed that neuroscience is now showing why effective psychological treatments happen to be correct in their understanding of psychological functioning and methods of impelling psychological change. Cozolino depicted his efforts as picking up where Freud left off when Freud devised the tripartite theory of mind, psychological defense mechanisms, the use of free association and interpretation in the talking cure, and other aspects of psychoanalytic theory and practice.

According to Cozolino (2010), Freud initially aspired to create a brain-based mapping of behavior and human experience, yet neuroimaging technology had not yet been created to allow for that, and the idea was also unpalatable to his contemporaries.

Freud's theory of mind (and the century of psychological and psychotherapy theories that followed it) was simply a metaphor that Freud was forced to adopt. This implies that mind can now be discussed directly in terms of neural correlates now that these factors are no longer a problem. Based on this premise and Freud's training in neurology, Cozolino asserted that psychotherapy emerged from neurology, and now the two fields can merge again after a century of being wrongly separated. I argue that this is an origin myth (see Samelson, 1974) in which Cozolino makes an appeal on behalf of psychology to the higher-status profession of neurology (and neuroscience generally) to show that psychology is useful for advancing a brain-based understanding of self, illness, and healing.

Cozolino drew from the narrative that psychology originated from neurology in order to reduce psychology to neuroscience, and also to reduce the concept of mind or human subjectivity to the material processes of the brain. By claiming that psychoanalysis (and the therapy theories that followed it) was a historical placeholder rather than a unique field, Cozolino provided an ahistorical, scientized understanding of psychology and psychotherapy. His argument relocates psychotherapy from a significant social and cultural institution to an individualized and mechanized healing instrument for the physical brain. Cozolino therefore used psychotherapy as a vehicle for neuroscience in order to show how neuroscience is the master science by asserting that neuroscience confirms the validity and accuracy of how Western culture thinks and talks about the self and psychological illness, healing, and healing technologies or practices. The use of psychotherapy as a vehicle for neuroscience is what Brothers (2001) argued neuroscience has needed in order to transform the socially widespread discourse about the self from

philosophical and social concepts into a discourse based on neuroscientific terminology. Cozolino's conclusions suggest that the work of psychotherapists should become one of promoting neuroscience through psychotherapy theory and practices.

Rhetorical Strategies Supporting the Thesis

Scholars (e.g., Bennett & Hacker, 2003; Brothers, 2001, Tallis, 2004; Uttal, 2007) have argued that cognitive neuroscience literature frequently relies on certain words, sentence structure, and other grammatical strategies to imply relationships between brain functioning and the concept of mind or subjective conscious experience. These portray unresolved yet significant questions about the self as already resolved (or likely to be resolved with more neuroscience research). These rhetorical strategies also materialize psychological concepts so that they appear objective and verifiable. In my textual analysis of Cozolino's (2010) book (see Chapter IV) I provided examples of rhetorical strategies that he used to portray relationships between mind and brain, and psychology and neuroscience, which warrant critical examination.

I began with statements that I categorized as ambiguous because they had two or more possible meanings as a result of the order of words in the statements. In some passages it was unclear whether Cozolino (2010) intended to describe people or brains. In other ambiguous passages Cozolino discussed mental experiences alongside descriptions of the brain yet it was unclear whether he intended to posit a causal relationship or simply a direct correspondence between neurobiological and psychological processes. His use of analogy to compare brain structures to social structures suggested a direct relationship between the individual brain and the emergence of human society, yet no specific scientific explanation was provided for how social order is a reflection of neural patterns.

This suggested that his premise of a strong relationship between psychology or psychotherapy and neuroscience relied upon a taken-for-granted or assumed relationship between brain and human personhood. Cozolino also used analogy to compare the roles of therapists, parents, and teachers based on the social functions of the brain that he implied to be similar to relationships between patient and therapist, child and parent, and student and teacher. This suggests that there is nothing inherently unique or special about psychotherapy that could not be achieved in another relationship as long as the brain is changed in the same way. This decontextualized and ahistorical representation of psychotherapy fit with his depiction of psychology and psychotherapy (and the human tendencies they study and problems they remedy) as inevitable products of the evolution of the brain rather than unique and important social institutions that emerged because of a confluence of historical and cultural factors.

Cozolino's use of diction (word choice and sentence structure) seamlessly intertwined psychological concepts and neuroscientific ones, thereby reappropriating the former as the latter, or in some cases directly asserted that the two epistemologies were interchangeable. At times he employed that strategy unbeknownst to the reader, and therefore his rhetorical support for his thesis was often very subtle. Unsuspecting or inexperienced readers might easily be convinced that psychological terms were intended to refer to neurobiological structures and functions. This is significant because it creates a discourse in which psychology is absorbed into neuroscience, thereby using psychology to relocate shared social and cultural understandings of humans to individual neurophysiology. Speculative language was also present throughout Cozolino's book. Many of his claims about evolution, neuroscience, and mind-brain correlates were

prefaced with language suggesting that the claims are hypothetical; at other times he offered predictions about what neuroscience might eventually discover about human consciousness and behavior. These predictions might seem exciting but it is unclear whether they are feasible.

The dramatic and broad quotes from important historical figures Cozolino (2010) placed before each chapter and subsection (epigraph) suggested that the scientized and reductionist understandings of human psychology that followed these quotes were in fact evidence supporting philosophical, religious, scientific, cultural, and literary observations of human beings across historical eras and epistemologies. Cozolino's thesis implies that all theories of human experience (such as psychoanalysis and other therapy theories) have unknowingly been descriptions of brain functioning rather than moral claims about health, illness, and the best way of life, and therefore his use of epigraph enacted and thereby reinforced his claim that psychological discourse was a historical placeholder for a neuroscientific one. Cozolino used figures of speech such as metaphor and personification to reduce mind to brain and therefore reduce psychology to neuroscience. He used personification, for example, to portray a brain that itself thinks, believes, learns, and decides on behalf of individuals. The sense of agency and control that this rhetoric strips from people in its depiction of human beings mirrored his thesis that human experience is a product of brain evolution.

I used the literary concept of *aporia* to describe statements in which Cozolino called into question whether his text could answer some of the important questions on which it was allegedly premised. For example, early in his book he rejected the possibility that his psychotherapy-neuroscience integration would be considered

reductionism, and he promised a thorough treatment of the task of identifying individual potential for psychological change and healing. Later in his book he denied that he was responsible if his efforts to integrate psychotherapy and neuroscience were interpreted as a reduction of mind to brain. As I showed throughout the Results chapter (see Chapter IV), much of his book contained highly reductionist and scientized understandings of psychology and psychological treatment. Therefore his use of aporia to deny responsibility for the likely effects of his book seemed more permissive than cautionary. In other words, he ultimately showed that he lacked concern about the effects of a brain-based psychotherapy on traditional psychological concepts such as mind. This disregard for psychology fit with his assertion that the field was a historical placeholder rather than an important institution whose emergence and broad societal relevance cannot be understood through a contemporary neuroscientific theory.

In another example of aporia, Cozolino putatively rejected the authority of neuroscientists who claim to have definitively determined how to predict an individual's potential for behavior change or psychological recovery. He encouraged readers to have faith in the ability of the brain to change, rather than having faith or trust in neuroscientists themselves. Finally, in another statement he acknowledged that if one follows his premise that the brain largely controls what individuals believe and what actions they initiate, then brain research might never be usable for explaining human functioning since scientists and others can never be sure that the brain is not deceiving them in their interpretations of research findings. These examples of aporia cast doubt on claims that a merger between therapy and neuroscience is a useful, relevant, and scientifically accurate endeavor. These statements were surprising because they seemed

to contradict the premise of his book, and they even implied that neuroscience is insufficient for addressing the large issues that he raised. However, rather than addressing these important concerns about brain-based psychotherapy, Cozolino did not engage in any significant discussion about the implications of these statements. It appeared to be more a strategy to relax the reader and appeal to an anti-authority tendency in contemporary American life, rather than a serious critique of all he previously asserted. This promotes an uncritical, resigned way of thinking. Below I discuss this problem further.

The Understanding of Self Perpetuated by the Thesis

The understanding of self in Cozolino's (2010) *The Neuroscience of Psychotherapy: Healing the Social Brain* begins with the assertion that the brain is first shaped by experience early in life (especially attachment relationships) outside of an infant's control, and later in life comes to exert tremendous influence over a person based on the patterns of neural firing that early experiences impressed into the brain. Throughout his book, individuals are at once portrayed as embedded within a social context because social contexts shape brain development, and then removed from that social context because Cozolino also described the brain as having innate tendencies that explain inherent qualities such as language, adaptability, and the potential for psychopathology. In other words, he attempted to explain both structuralist and poststructuralist social theory as reified in brain structures. Regardless, according to Cozolino's theory, humans are able to gain control of their lives and their psychological functioning by regaining control over the brain through acting in whatever ways have been proven to change its functioning. This implies that individuals must learn about

neuroscience, or certain interpretations of neuroscience, in order to learn about how and why the self can change. Human agency thus becomes a quality that is not possessed by individuals, but instead is dependent on the pronouncements of neuroscientific expertise. These conflicting visions of a material human being suggest that Cozolino's theory holds a vision of a perpetually uncertain self, lingering between genetic determinism and the brain research Cozolino positioned as necessary for rejecting it. The self is trapped between a sense of agency and acquiring knowledge about neuroscientific findings that grant that agency. Cozolino serves as an interpreter of brain science who depicts this science as accessible and easy to learn for lower-status professionals (psychotherapists) who have not studied neuroscience yet have come to believe in its relevance and accuracy. Therapists are made to be the model for a self that is a scientific novice who is dependent on scientific expertise to validate socially valued theories about human nature.

Above I reviewed Cozolino's strategy of *aporia* (see pp. 178-182) or statements that call into question the entire purpose of his text. In one of those statements Cozolino wrote that he does not trust neuroscience experts who claim to have found any answers to questions about the human potential for change, which was surprising for a text based on neuroscience research and jargon. He claimed that he instead trusts in the ability of the brain to change, and in the ability of "our own ingenuity to discover new solutions" (Cozolino, 2010, p. 210) to those issues. His statement casts doubt on whether neuroscience is able to discover anything that psychological research methods, combined with clinical judgment and experience, had not already established. However, his statements assume that even if neuroscientific claims about the self are useful only to support what therapists and others already know, neuroscience should still be combined

with everyday psychological discourse because ideas about the brain are privileged as a way to understand the self. Even with Cozolino's surprising rejection of neuroscience expertise about psychology and the self, he assumes the role of alternative neuroscience expert who interprets this science and mandates its use. Despite the rhetorical promise to liberate the self from uncritical allegiance to the authority of neuroscience, the self is still a scientific novice dependent upon neuroscience experts. In other words, he portrays a certain inevitability to the understanding that the study of the brain is the study of the self. The choice to forego the use of neuroscience altogether is never presented; whether humans have or do not have agency and self-directedness is still dependent upon whether Cozolino and other experts permit it.

Throughout my Results chapter (see Chapter IV) I argued that Cozolino's (2010) neuroscientific interpretations of the self perpetuate an interiorized, socially removed, and inward vision of human beings that is reminiscent of much modern era philosophy. His claim that Winnicottian and object relations schemes best describe the self that is created by brain functioning is evidence of that interiorized modern self. Even when he claims that the brain is a social organ that is socially interdependent, and is constructed through narrative, by having materialized those social qualities Cozolino presents a vision of human beings that is individualized rather than contextualized. This is a significant problem with using neuroscience to solve the mind-body or mind-brain problem. Cozolino's efforts show how the idea of a brain-based psychotherapy represents a literal perpetuation of Cartesian dualism through a physical reification of structuralism wherein moral discourse is concretized through the brain and disguised as scientific findings.

In another example of aporia, Cozolino (2010) surprisingly noted that, since the brain is a biased and distorted controller of perception, yet individuals rely on it to interpret neuroscience research about human psychology and the self, humans might never obtain the objective understanding of the brain or human experience that neuroscience seemingly promises. This statement seemed to acknowledge a legitimate concern about his use of neuroscience, yet he ignores any further implications and instead resigns to continuing these efforts. Cozolino's statements only further an uncritical and enduring belief that personhood is equivalent to brain functioning since he dismisses any other approach to understanding the self. In that regard, even the self as scientific novice becomes an illusion produced by the brain. I posit that since neuroscience is an expertise that might never be able to live up to its promise of providing objective answers, readers are left in an untenable position characterized by uncertainty about what to believe about themselves yet hopeful that brain science will confirm their beliefs. For therapists these beliefs are often represented by psychotherapy theories. Psychotherapy theories embody cultural and historical understandings of self, and Cozolino maps those theories onto the brain.

Cozolino keeps the reader locked in a cycle of hoping that neuroscience will resolve important philosophical questions about human beings. For example, he briefly speculated that neuroscience research will reveal the origins of human consciousness. Elsewhere his speculation ranged from ways in which rat brains could be models for the human brain, to ways in which the brain is activated during psychodynamic therapy interventions. His speculative approach (and his brief acknowledgement of the logical flaws of a brain-based understanding of human personhood and psychological

experiences) leaves readers indefinitely reliant upon neuroscience to answer these questions. Cozolino's writing style almost invariably overlooks the concept of mind and instead mostly describes human experience alongside descriptions of brain functioning. One could argue that throughout his book Cozolino simply portrayed eliminativism (that is, the belief that psychological concepts such as subjectivity and consciousness are without neural correlates and are therefore fictions that are waiting to be replaced with descriptions of how brain functioning produced reality). Yet he also proposed that, with enough support from interpreters of neuroscience such as himself, neuroscience could be used to challenge eliminativism if psychological concepts are verified by mapping them onto the brain. In this conflicting theory the self is perpetually reliant upon interpretations of neuroscience research because the self is resolute in its assumed need for neuroscientific validation of psychological, psychotherapy, and other theories about the self. However, the self is also portrayed as equivalent to the brain. Cozolino offers hope that maybe this is not true by challenging the expertise of neuroscientists. But even if people find their own ways of believing that they are their brain, biological determinism still stands because the language of psychology and subjectivity is lost. When Cozolino applies his theory to psychotherapy through his case vignettes, freedom is restored in suddenly ambitious, overly technical, and eclectic ways. However, even after he positions himself as a savior of human freedom, it is not clear that he ever truly restores the freedom to humans that his brain-based understanding of self already stripped away. In other words, beneath the excitement and hopefulness that neuroscientific jargon might generate, there is a rather unfulfilling and depressing understanding of human beings.

Cozolino never presents readers with the option to disregard neuroscience or brain-based understandings of therapy or the self. Therefore, sociocultural perspectives that coherently address these conflicts are dismissed entirely in a discourse founded on a materialized intrapsychic self over which patients are trying to regain control. He leaves no room to talk about the historical and cultural circumstances in which individuals are born and develop. For Cozolino there is ultimately no shared context aside from whatever our brains evolved to have in common, which is his definition of culture and society. In other words, there is little that is shared aside from the common need of personal enhancement and private gain. Because there is no option in his book to forego the conflation of psychotherapy and neuroscience, there is no way of thinking about the self that understands the cultural and historical crossroads from which contemporary neuroscience emerged and later became integrated with psychotherapy theories. His approach uses therapy as a tool to ensure that neuroscience retains control of the study of self, the outcomes of that study, and whatever commercial, biomedical, and other purposes that such an understanding of the self might further.

The Potential Effects of the Thesis on the Practice of Psychotherapy and the Profession of Psychology

Above I suggested that Cozolino places therapists in the role of a model for a confused yet compliant self. Simply because Cozolino intermittently alludes to the idea of a socially-emerging selfhood embedded in a cultural context does not necessary translate into a truly contextual, historically- and socially-minded understanding of human psychology. In fact, his confusing (and generally absent) use of the concept of mind is a blatant disregard for psychology and instead represents a perpetuating of self as

brain and psychology as fiction. Although for much of the 20th century psychotherapy theories have perpetuated the problems of an individualized, modern era configuration of self, a brain-based psychotherapy theory is especially persuasive because it seems to be justified primarily by the excitement that is often generated by neuroscientific rhetoric and its taken-for-granted claims about materialism and the self. Perhaps his conflicting views represent an attempt at creating a wide appeal for his book. However, as I have suggested, his understanding of self as brain is a depiction of at least material reductionism, and possibly eliminativism. Psychotherapists and psychologists should recognize that a vision of psychological concepts as historical placeholders for neurobiological processes ultimately results in the expiration of psychology as a serious profession, academic field, or way of talking about human beings (see I. Gold & Stoljar, 1999). The self is required to be a scientific novice about a science that might not even work to achieve what it is supposed to achieve. The self is at once confused about whether it has agency yet continues to be compliant in a fruitless attempt to address that and other philosophical issues. Therapists are assigned the role of modeling this confused yet compliant self.

Cozolino (2010) positions psychotherapists as advocates for neuroscience as the correct paradigm for understanding the self and the relationship between individual development and the cultural context in which personhood emerges. One way that this shows up is with Cozolino's recommendation that therapists assure patients that their problems are common to all humans because of imperfect brain functioning that is not unique to individual patients. This is an example of how the incorporation of a neuroscientific understanding of self into therapy discourse could directly disregard

subjectivity and agency (and therefore detract from the ability of therapists to engage in any meaningful discussion of morality and responsibility). At the same time, he used neuroscience to explain and combine established therapy theories rather than invent a new one. He also described case vignettes that depict courses of psychotherapy in which he applied an assortment of interventions in a rather confident fashion without consistent theory or justification other than the portrayal of quick psychological change and easy malleability of the brain and self. His combination of a material self that has the potential for quick-changing malleability led to interventions that are instrumentalist, targeting specific psychological and neurophysiological goals. These interventions produced little insight about how or why patients' difficulties arose. The result was an incoherent eclecticism rather than a clearly articulated treatment approach.

Cozolino often demonstrated rather playful and creative therapy activities—for example, having a patient imagine a different personal history in order to change the recurring psychological effects of painful memories that are purportedly stored in the brain. His approach disregards the contexts in which patients' problems arise and therapy is effective. There was little rationale given for his treatment choices. In other words, the use of neuroscience fails to answer the questions of what therapists are doing, who they are doing it with, and why they are doing it. As I discussed earlier (see Chapter II), addressing those issues has been described as the point of integrating neuroscience and psychotherapy. Cozolino's theory gives therapists permission to implement whatever therapy theories or techniques they desire as long as they can be justified by an appeal to brain functioning. This does nothing to address the moral questions raised by the debates

within psychology about how or whether to establish best practices in psychotherapy and assess their efficacy (i.e., the meanings of concepts such as cure and health).

In Cozolino's psychotherapy theory, insight about the self or psychological development becomes insight about the brain. He even demonstrates how to rewrite psychological development through his brain-based accounts of his own development of self, as well as some of his typical behaviors. He materializes family life by describing its influence on brain structures as a way to create an integrated or coherent narrative about psychological difficulties and the ways in which psychotherapy remedies those difficulties through the effects that the therapy relationship and therapy discourses confer upon the brain. Cozolino's rejection of neuroscientists claiming to have discovered with certainty answers about the potential for individual change appeals at once to the antiauthority sentiments that are a hallmark of the modern self, and the antiscientific sentiments that took hold during the 20th century and cast doubt on the applicability of the scientific method to the understanding of individual experience. Yet the portrayal of neuroscience as an alternative and progressive science that lends support to social selfhood, healthy individuality, and critical treatment of scientific authority could serve simply to reinforce the authority and appeal of a scientific study of human psychology. The creative variety of appeals to neuroscience is an implicit acknowledgement of the methodological flaws of cognitive neuroscience (that is, the effort to ascertain the neural correlates of psychological concepts). This exemplifies why mind-brain literature is vulnerable to melding cultural discourse to interpretations of brain functioning in whatever way an author or researcher desires. There are traditional guidelines about what makes a good interpretation, but they are found in the humanities, not in neuroscience.

Cozolino's (2010) ahistorical and scientized understanding of psychotherapy has several possible consequences for psychology and psychological treatment. It is helpful to recall that Cozolino concludes his book by predicting ways in which therapy will become more closely tied to neuroscience. For example, he predicts the use of neuroimaging as a routine part of psychotherapy planning and progress monitoring, and the use of neuroscientific terms in therapy case conceptualizations. These are lofty predictions. First, there are many problems with those ideas that Cozolino does not address. For example, if patients do not report psychological improvement even though brain scans suggest it (or conversely, if a brain scan fails to indicate the neural correlates of the psychological improvements that patients are reporting), in what ways could psychologists and psychotherapists expect to be held ethically and legally accountable? Cozolino's prediction assumes a direct mind-brain correlation; therefore his predictions for the practice of psychotherapy imply that he is also predicting that neuroscience will thoroughly map direct mind-brain relationships. In other words, he is encouraging therapists to adopt a mindset of hope and expectancy that the self will be even more understood as a function of human neurobiology. Psychologists and psychotherapists should remember the work of scholars (e.g., Bennett & Hacker, 2003; Brothers, 2001; Noë, 2009; Tallis, 2004) who have argued that neuroscience will never solve many of the mysteries of human consciousness, not because of a lack of trying, but because positioning the study of psychological concepts as the study of those concepts' neural correlates is a conceptually flawed endeavor.

One possible effect of Cozolino's (2010) theory is that neuroscience could serve to distract psychologists and psychotherapists from efforts that are more likely to

maintain the viability of psychotherapy as a profession. After considering arguments such as those of Orange (2003) about the problems with total physical reductionism in psychology, I have come to believe that the only way to substantiate the field of psychology and the practice of psychotherapy is through using the psychological methods already available to us (quantitative, qualitative, and sociocultural or interpretive research approaches), through continuing to debate in psychological rather than neuroscientific terms the benefits and difficulties with each of those methods, and through addressing the moral questions raised by psychological theories and these debates surrounding how best to understand them.

Although the incorporation of neuroscience into psychotherapy research (and now into psychotherapy discourse with texts such as *The Neuroscience of Psychotherapy*) could not have happened without the longstanding desire by psychology to legitimize itself as a true science, neuroscientific visions for psychotherapy do not only reproduce and further empirical research methods and the problems with using the scientific method to understand individuals. Cozolino's (2010) theory also diminishes the reader's ability to think critically about psychological theories and research methods because neuroscience is used to meld all of those approaches together, thereby denying that these moral debates even exist. Readers are permitted to believe not only that evidence exists for whatever therapy approaches they happen to believe in or utilize, but also that all psychotherapy theories make the same claims about the self and the best way of life—specifically, a self that is biomedical in its origins and concerned with neuroscience as its primary intellectual endeavor. This is why, although I disagree with the primacy given to empirical outcome studies in psychotherapy research over sociocultural or historical

interpretations of therapy practices, I believe it is far more dangerous to move these important debates entirely into a neuroscientific discourse rather than a social or philosophical one to avoid addressing these contentious issues altogether. Doing so perpetuates the problem of psychologists, psychotherapists, and psychotherapy trainees not having the knowledge or interest in addressing the moral issues that are often veiled in psychotherapy theories and practices. Neuroscientific explanations are simple, and for cultural reasons they are often exciting for readers as well. However, Cozolino's (2010) book illustrates how this excitement unknowingly reduces psychology to neuroscience, and this ultimately erases issues of consciousness and subjectivity. The loss of psychological concepts is dehumanizing, and I find that to be more disconcerting than exciting.

One reason Cozolino is able to make a brain-based psychotherapy appear useful and appealing is that he positions the brain as an easy answer to the questions of how and why psychologists and psychotherapists became tasked with such a wide variety of professional duties. For example, many psychologists and psychotherapists—even within a single day—provide treatment for patients whose symptoms range from neurological disease, to chronic mental illness, to general life stressors, while alternating between various treatment modalities (individual, family, group). Blurring the boundaries between psychology and neuroscience is easy when Cozolino blurs the boundaries between clinical psychology and neuropsychology. There is certainly professional overlap between clinical psychology and clinical neuropsychology (e.g., neuropsychologists invariably deal with all categories of mental health diagnoses when assessing and treating brain disease and injury, and many clinical psychologists conduct assessment,

evaluations, and even treatment for disorders such as attention deficit disorder, autism, or dementia that are typically understood to have neurobiological correlates). However, readers should not be easily persuaded by undisciplined uses of concepts such as memory, which have different meanings in clinical neuropsychology than traditional psychotherapy theory. This recommendation is not meant to condemn the relationship between psychological assessment and psychotherapy. Those endeavors are parts of the same field, and how they fit together is an important issue that comprises psychology's unique domain over mental health research, treatment, advocacy, forensic and medical applications, and other interests. What is troubling, however, is the prospect that Cozolino's readers might be convinced that talk therapy is simply a neurobiological intervention because therapists have an interest in the effects of memory on individual functioning and experience, and some psychologists (particularly neuropsychologists) study and evaluate symptoms of memory difficulties (such as sudden forgetfulness or longstanding disabilities with learning or retaining information).

With this type of conflation Cozolino exploits any possible unawareness amongst readers that psychology has had a longstanding interest in proving itself a legitimate science, and that even scientific psychology is not a natural scientific observation of the physical world. However, there is good evidence in Cozolino's case vignettes that he intentionally used neuropsychology in this way. In one of his first case vignettes, Cozolino recalls conducting family therapy for the treatment of a patient with a traumatic brain injury. His treatment involves psychoeducation with the family about their son's psychological symptoms such as irritability that resulted from the injury, and ways to support his recovery, in addition to community reintegration through social services.

The above seems to be a reasonable approach with this patient. However, in the remainder of Cozolino's case vignettes he frequently discusses various psychotherapy interventions in terms of their alleged effects on the brain. Mental health researchers and practitioners should remember that even if symptoms have some neurological component, psychologists are uniquely qualified to treat patients because of a deep understanding that those symptoms are still embedded within systems and relationships, and even neurological issues manifest in symptoms that are psychological and therefore exist because they are based on observations of persons (not observations of the brain).

Moreover, psychologists devised assessments for cognition, memory, attention, and personality prior to the early 1990s when neuroimaging was first used in psychotherapy research. Neuroimaging at times provides support for psychological findings, and it has certainly been used as evidence in legal matters. For example, locating brain lesions that are causing behaviors beyond individual control has helped to establish reduced culpability in criminal proceedings. But Cozolino's book is not about that issue. It is important that readers consider the difference between something that is interesting and something that is necessary. The fact that some neurological disorders can cause involuntary physical and psychological symptoms does not translate into an assumption that all behaviors and experiences throughout a person's life are also involuntary and spurred by the brain's alleged control over one's life.

Rather than attempting to transform psychological concepts into material objects for natural science inquiry, ensuring the long-term viability of professional psychology is likely to require political activism that empowers psychologists through measures such as fair reimbursements from insurance companies and expanded access to treatment

populations. Those measures necessarily involve issues of fairness, civic engagement, and shared responsibility for managing the societal impact of mental disorders. In other words, these measures require the type of thinking that Cozolino never mentioned in his book, and worse, is made more difficult by a brain-based discourse that locates the social within a materialized, somatic individual.

Regardless of Cozolino's brief disavowal of reductionism, and regardless of his understanding of the brain as a social organ, his attempt to combine psychotherapy and neuroscience is suggestive of an a priori, individual, neural self. At the very least this perpetuates reductive materialism, and likely propagates eliminativism or the position that psychology is a historical placeholder for neuroscience. The hope that readers come to place on neuroscience proving the validity of psychology and psychotherapy seems to perpetuate the position that psychological concepts such as mind, subjectivity, and consciousness are merely fictions that should be done away with so that humans can speak about themselves in neuroscientific rather than social and philosophical terms. In fact, Cozolino's portrayal of traditional psychotherapy concepts as historical placeholders for neurobiological theories is a good strategy for depicting human psychology as a myth. In his book, the absence of much use of the concepts of mind and consciousness also might further an eliminativist position.

Sociocultural theories posit that psychology and psychotherapy are inseparable from the Western cultural context because they are cultural and historical institutions that have an irreplaceable influence over the way people think and talk about the world and the purpose of humans within it. To extract these fields from culture and history with decontextualized descriptions about their origins (and scientized claims about their

purpose) in essence furthers a society in which psychological theories and treatments at first perpetuate a technicized, instrumental understanding of self, and later erases the self altogether.

In sum, the effects of incorporating into psychotherapy theories a vision of materialized personhood (presented as a mechanized brain that controls individual functioning) is ultimately an erosion altogether of psychology and psychotherapy. In other words, Cozolino might cause therapists unknowingly to cheer for their own demise. This might seem to be a dire prediction. However, if one takes seriously the possible disregard for subjectivity and agency that neuroscientific visions of humans suggest (especially in the absence of coherent or sincere efforts to address psychological concepts such as mind), then one should seriously question whether psychology and psychotherapy could exist if therapists, researchers, and patients began to discuss human problems and solutions entirely in terms of the brain.

The Political, Economic, and Social Arrangements Replicated by the Thesis

A cultural and historical interpretation of Cozolino's (2010) psychotherapy theory highlights a need amongst psychologists and psychotherapists to challenge the promises of an uncritical integration between neuroscience and psychotherapy. His efforts warrant closer scrutiny than psychotherapy scholars have adequately provided. For example, Victoria Pitts-Taylor's (2010) criticism of the use of the concept of brain plasticity to validate sociological theory (and progressive political ideas about the impact of culture and history on human functioning) is one example of an especially relevant criticism because Cozolino's brain-based psychotherapy seems to promote an individualized, material understanding of the self and self-improvement. She argued that the underlying

ideas about citizenship and selfhood valued by biomedical selfhood are consistent with neoliberal economic and political arrangements that hold a vision of a priori individualism valued above democratic ideals and the collaborative civic engagement necessary to foster equity and justice. The understanding that the self is a brain that inevitably evolved to control human psychology and subjective experience is an understanding of self and human nature that is universal across time and place. This is incompatible with cultural sensitivity, recent philosophical theory, or relevant mental health practices. Cozolino's case vignettes are good evidence of how a technicized and instrumentalized talk therapy purposed to target specific brain changes inherently dismisses psychological concepts such as subjectivity and consciousness, and therefore unknowingly dismisses the role of culture and context in creating a shared discourse about psychological illness and change.

I argue that universalizing human experience as a product of the brain rather than understanding its emergence within a social and cultural matrix threatens to unknowingly perpetuate conservative or status quo political arrangements. For example, in my textual analysis I interpreted one passage that was indicative of Cozolino's overreach (he claimed that women often return to employment shortly after childbirth because the brain commands it). His brain-based understanding of this issue overlooked the lack of progress in public policy related to workers rights and general family services that has been associated with the issue of insufficient maternity leave in the United States. Reducing problems to the evolution of the brain dismisses the ways in which shared economic and social arrangements produce distress and difficulties amongst citizens in many capitalist systems. Cozolino's application of a brain-based therapy theory directly

threatens to diminish a reader's ability to contextualize psychological issues and to recognize that inadequate democratic representation and fairness is contributing to patients' difficulties.

Near the end of his book, while reiterating the importance of remembering that the brain changes in response to experience, Cozolino (2010) abruptly asserted that, "the neural network dissociation that often results from exposure to combat should make us pay closer attention to those whom we put in harm's way" (p. 357). This is a good example of a statement that might appeal to therapists during a cursory reading because it sounds as if Cozolino is bravely questioning the institution of war. He seems to be subversively challenging authority and presenting a progressive social and political alternative to the state of perpetual war that has been a defining feature since the first colonists arrived in the U.S., and which has of course been quite pronounced in the decade between September 11, 2001 and 2010 when Cozolino's book was published in its current edition. In fact, a closer examination of his statement shows that he takes no political stance whatsoever. It is not even clear that he is challenging the institution of war itself. His statement is at best meaningless, and at worst subtly reinforces the moderate position that perhaps combat is regrettable yet should remain a fairly common endeavor for the United States to engage. His statement's most literal meaning—that brain science should cause people to "pay attention" to active duty soldiers but take no active political position regarding the institutions they represent—is a good metaphor for Cozolino's broader depiction of the relationship between neuroscience and psychotherapy. That is, Cozolino supports questioning neuroscience, interpreting neuroscience in ways that support psychotherapy theories, using it to justify

psychological healing and change, and even perhaps advocating for a more socially-minded rather than individualized use of science—yet he never provides the option to disregard neuroscience entirely, develop a more robust sociocultural vision, or avoid altogether the integration between brain research and psychotherapy. Like the soldiers whose welfare he really only minimally cares about, Cozolino's concern for the institution of psychotherapy is at best minimal.

Despite the many therapy theories that Cozolino (2010) presents as options for mental health practice, and despite the treatment of neuroscience as an alternative-minded science that could confirm important values about psychology and the self, he presents little choice to readers, and instead depicts a great deal of inevitability with regards to the merger between neuroscience and psychotherapy even in general therapy practice. His implications lead to statements that sound progressive but never really challenge the roots of social injustice and violence—namely, the complicity with the status quo, an erosion of civil society and community involvement, and resignation about the possibility that individuals may affect larger change through psychotherapy discourse. It seems more likely that broader social progress is not possible with a reductionist, material selfhood such as the vision of humans that a brain-based therapy promotes. Why would it be? According to Cozolino, human selfhood, culture, society, and history have been primarily products of the evolution of the brain. This necessarily implies that war, for example, or the inability of women to take time away from work following childbirth, must also be products of brain functioning. Yet to admittedly naturalize social ills such as war, and to declare it inevitable, would be quite unappealing to many readers. In other words, Cozolino's vision of the brain as the self is a vision of justified helplessness. Cozolino

could not elaborate on what he intended to convey with his recommendation that readers pay attention to soldiers, since a logical conclusion following his brain-based theory would suggest that war itself is inevitable (or, that the inevitability of war is just as tenable of a position as the opposition to it). However, in order to actually question something like war, psychological concepts such as mind and self must be located in a sociocultural context—that is, in the relationships between people (such as therapist and patient) rather than in brain cells and circuits of individuals. The brain-based self and brain-based psychotherapy is an understanding of self and psychology with no cultural or historical frame and therefore no shared understanding of the good, other than whatever values and ways of living are promoted or reinforced by neurochemical or biomedical selfhood. The reader becomes easily manipulated, just like he or she is convinced of the ability to manipulate the brain functioning of patients to help them heal and change. This is a helpless and complacent selfhood. Not questioning the authority of neuroscience is good practice for not questioning other forms of authority as well.

Although brain-based therapies hold the hope for many therapists for advances such as greater reimbursements from third party payers and greater societal esteem through scientific accuracy in diagnosis and treatment of psychological conditions, scientized and reductionist texts breed the very complicity that therapists need to avoid in order to reclaim some authority over psychotherapy practice from interests such as insurance companies or government programs that therapists appeal to for reimbursement. In other words, brain-based psychotherapy theories could unknowingly have little or even detrimental effects on the efforts for which therapists seem to have placed many personal and professional hopes. In my hermeneutic interpretation of

Cozolino's (2010) text I have shown why his use of neuroscience is likely to convince readers that everything in his book is true. With his statements I labeled aporia (see above) Cozolino then casts doubt on his entire purpose, quite suddenly nothing becomes true. At its worst, confusion and ambiguity result in political apathy, which ultimately leads to hopelessness and despair. Because Cozolino's (2010) efforts are ahistorical, his book is unable to foster a way of thinking that might condemn anything about the current time and place in which it has emerged and gained favor. Cozolino's vision is a neutral understanding of therapy and mental health. It safely avoids polarizing readers at a time when the United States is quite polarized politically, economically, and socially. In *The Neuroscience of Psychotherapy*, American complicity is reinforced through the use of psychotherapy as a venue to further remove the mind or self from context and human relationship. In Cozolino's book there is a psychotherapy theory or practice that could appeal to nearly any therapist, as long as readers do not disagree with the use of the brain as a means by which to understand and integrate psychotherapies. That is why a hermeneutic interpretation of the context, claims and rhetoric involved in integrating mind and brain is especially helpful for revealing the implications of mind-brain reductionism for the self, and thus for society more broadly. Psychologists and psychotherapists should attend closely to the cultural and historical circumstances from which brain-based therapy theories have emerged before adopting these therapy practices.

Finally, Cozolino is a good writer, and like most good writers, his efforts culminate in a book that is easy to read and which seems quite appealing. Unfortunately, the use of psychotherapy as a vehicle for a more widespread neuroscientific discourse,

and one that is firmly engrained in how people talk about the self and its ills, ultimately seems dismissive of psychological research and psychotherapy theories because it unknowingly dismisses subjectivity, agency, and morality. It is therefore dismissive of a more coherent discussion about relationships, culture and civic engagement—in other words, the good. The sense of complacency that Cozolino's efforts perpetuate could be more likely to harm the viability of psychotherapy than to save it. A brain-based psychotherapy, in addition to being scientifically and logically questionable, is simply too good to be true. In other words, it is too easy for solving the difficult historical and moral problems that psychotherapy has for some decades been facing. As psychologists and psychotherapists we have to try harder.

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Appendix A

Further Examples of Primary Content of

The Neuroscience of Psychotherapy: Healing the Social Brain (Cozolino, 2010)

The definition or general purpose of psychotherapy.

Psychotherapy as a venue for neural integration.

“At the heart of psychotherapy is an understanding of the interwoven forces of nature and nurture, what goes right and wrong in their developmental unfolding, and how to reinstate healthy neural functioning” (p. 13).

Psychotherapy can be thought of as a specific type of enriched environment that promotes social and emotional development, neural integration, and process complexity. The way the brain changes during therapy will depend upon the neural networks involved in the focus of treatment. (p. 20)

The very way that the brain has evolved to successfully cope with immediate threat appears to have created a vulnerability to longer term psychological distress: Enter psychotherapy. Applying this model, psychotherapy is a means of creating or restoring coordination among various neural networks. (p. 25)

A basic assumption of both neuroscience and psychotherapy is that optimal functioning and mental health are related to increasingly advanced levels of growth, integration, and complexity. On a neurological level, this equates to the integration and communication of neural networks dedicated to emotion, cognition, sensation, and behavior and a proper balance between excitation and inhibition. On an experiential level, integration is the ability to live life—love and work—while employing a minimum of defensiveness. . . . From the perspective of neuroscience, psychotherapy can be understood as a specific kind of enriched environment designed to enhance the growth of neurons and the integration of neural networks. The therapeutic environment is individually tailored to fit the symptoms and needs of each client. I propose here that all forms of therapy, regardless of theoretical orientation, will be successful to the degree to which they foster appropriate neuroplasticity. (p. 25)

“Psychotherapy can serve as a means to reintegrate the patient’s disconnected hemispheres through reality testing, emotional expression, and putting words to feelings in the context of a caring relationship” (p. 110).

The organization of autobiographical memory that includes input from multiple neural networks enhances self-awareness and increases the ability to solve problems, cope with stress, and regulate affect. This integrative process is what psychotherapy attempts to establish when it is absent. (p. 207)

“Given that psychotherapy is an enriched environment for social-emotional learning, we can assume that the challenges we provide our clients build more complex and resilient brains” (p. 330).

Psychotherapy as a relationship that is similar to other relationships that facilitate neural integration.

“In psychotherapy we are tapping the same principles and processes available in every relationship to connect to and heal another brain” (p. 305).

“Language within significant relationships has shaped the brain during evolution and continues to do so throughout our lives. Because of this, narratives embedded within an emotionally meaningful relationship (like psychotherapy) are capable of resculpting neural networks throughout life” (p. 343).

General reasons why people seek psychotherapy.

A lack of “optimal” neural functioning is implicated in the problems for which people seek treatment with psychotherapy regardless of the severity or types of problems.

At the heart of psychotherapy is an understanding of the interwoven forces of nature and nurture, what goes right and wrong in their developmental unfolding, and how to reinstate healthy neural functioning. When one or more neural networks necessary for optimal functioning remain underdeveloped, underregulated, or underintegrated with others, we experience the complaints and symptoms for which people seek therapy. We now assume that when psychotherapy results in symptom reduction or experiential change, the brain has, in some way, been altered. (Kandel, 1998, as cited in Cozolino, 2010, p. 13)

Many people, perhaps even the majority of clients in psychotherapy, do not come for treatment of a major psychiatric illness. Most clients who are somewhat “less ill” have so far not been included in extensive (and expensive) outcome research that includes brain imaging studies. Many people seek psychotherapy simply because, as they often say themselves, life has somehow gotten out of balance. This may mean that their fears and worries have taken control of their lives and limited their ability to function or find happiness in the world. Others find themselves devoid of emotion and without empathy for others, leading them to seek therapy to save their marriages and relationships with their children. Many have the sense that they are not living up to their potential or get in their own way when it comes to worldly success and emotional satisfaction. These clients are often referred to as the ‘worried well,’ implying that they should somehow get over themselves and get on with life. My sense is that this group of patients, in which I would include myself, also suffer various versions of a homeostatic imbalance. An exaggerated reliance on intellectual defenses, overemotionality, or a negative attachment experience can become established as self-perpetuating patterns that lead to social isolation and underperformance. All of these

suboptimal lifestyles are most likely reflected in biased patterns of neural activation, which become the focus of psychotherapy. (pp. 162-163)

The following eight problematic aspects of brain functioning...cause many people to come to psychotherapy:

1. The suppression of language and predictive capacity under stress
 2. Divergent hemispheric processing
 3. The bias toward early learning
 4. The tenacity of fear
 5. The damaging effects of stress hormones
 6. The speed and amount of unconscious processing
 7. The primacy of projection
 8. Unconscious self-deception
- (p. 306)

Psychotherapy remedies problems that result because the human brain initially develops in accordance with early childhood experiences.

As highly adaptive social organs, our brains are just as capable of adjusting to unhealthy environments and pathological caretakers as they are to good-enough parents. While our brains become shaped to survive early traumatic environments, many of these adaptations may impede health and well-being later in life. Negative interpersonal experiences early in life are a primary source of the symptoms for which people seek relief in psychotherapy. (p. 206)

Patients are often being held back in their potential to enact desired changes because of the way in which their brains have constructed reality.

At the heart of psychotherapy are two interwoven processes; the first is the way in which our brains and minds construct reality, while the second is our ability to modify these constructions to support mental health and well-being. In other words, why are we so vulnerable to constructing distorted realities, and how can we learn to counterbalance these distortions? People come to therapy because one or more aspects of their lives are not how they would like them to be. Most often our clients know what they should be doing differently but cannot bring themselves to make changes. They come in with a feeling that something within them is holding them back. The answers to their questions can usually be found in the architecture of the hidden layers of neural processing—those networks within the brain that construct reality, guide our experience, and shape our identity. (p. 133)

Psychological defenses (also described as the adaptations of neural networks) are no longer effective for coping.

“What Freud called defenses can be seen as ways in which neural networks have adapted to cope with emotional stress. People seek treatment when their defense mechanisms cannot adequately cope with repressed emotions, or when symptoms become intolerable” (p. 34).

The definition and etiology of psychopathology.

Mental disorders are types of inadequate neural integration.

If everything we experience is represented by instantiations within neural networks, then by definition, psychopathology of all kinds—from the mildest neurotic symptoms to the most severe psychosis—must also be represented within and among neural networks. In line with this theory, psychopathology would be a reflection of suboptimal development, integration, and coordination of neural networks. Patterns of dysregulation of brain activation found in disorders such as depression and obsession-compulsive disorder support the theory of a brain-based explanation for the symptoms of psychopathology. (p. 24)

I postulated earlier that neural network integration should correlate with mental health, while dissociation or imbalance among neural networks should correlate with mental illness. If this is true, we can assume that integration between the right and left hemispheres is one element of optimal brain functioning. It turns out that anxiety, affective disorders, psychosis, alexithymia, and psychosomatic conditions have all been linked to deficits in the integration and balance among the cerebral hemispheres. (pp. 105-106)

Humans have the potential to experience psychopathology because of how the brain evolved.

The neural circuitry involved in fear and anxiety, although biased toward the right hemisphere, involves both hemispheres and all levels of the triune brain. The most primitive subcortical fight-or-flight circuitry, shared with our reptilian ancestors, interacts with the most highly evolved regions of the cortex. This results in the capacity to experience anxiety about everything from an unexpected tap on the shoulder to an existential crisis. (p. 239)

“The increased size of the human brain and its additional processing capacity make it possible for us to worry about many more potential dangers, both real and imagined” (p. 253).

The continuum of normality to abnormality represents a continuum of stress responses.

Early deprivation or chronic stress increase the chances of damage to the brain, deficits in memory and reality testing, and the prolonged utilization of primitive defenses... With increased nurturance and support, stress hormone levels decrease; physical comfort and soothing talk with caretakers helps the brain to integrate experience. (p. 22)

From extreme PTSD to everyday neurosis, we all exhibit a pattern of integration and dissociation reflective of our adaptational history and the health of our brains. At the level of the experience of self, networks dedicated to sensation, perception, and emotion seamlessly integrate into the emergence of conscious experience. (Damasio, 1994; Pessoa, 2008; Fox et al., 2005, as cited in Cozolino, 2010, p. 151)

For each of us there is a point at which fear crosses the line into trauma, causing severe disturbances in the integration of cognitive, sensory, and emotional processing. The psychological and neurobiological reactions to traumatic experiences lie on a continuum of severity. As a general rule, the earlier, more severe, and more prolonged the trauma, the more negative and far reaching its effects (De Bellis, Baum, et al., 1999; De Bellis, Keshavan, et al., 1999). Unresolved trauma may result in symptoms of post-traumatic stress disorder (PTSD), which reflect the physiological dysregulation and dissociation of multiple neural networks. (Cozolino, 2010, p. 262)

Psychopathology resulting from nonsecure attachment experiences.

“A basic assumption is that loving connections and secure attachments build healthy and resilient brains, while neglectful and insecure attachments can result in brains vulnerable to stress, dysregulation, and illness” (p. 180).

Bowlby suggested that early interactions create *attachment schemas* that predict subsequent reactions to others. Schemas are implicit memories that organize within networks of the social brain, based on experiences of safety and danger with caretakers during early sensitive periods. A secure attachment schema enhances the formation of a biochemical environment in the brain conducive to regulation, growth, and optimal immunological functioning. Insecure and disorganized attachment schemas have the opposite effect, and correlate with higher frequencies of physical and emotional illness. (p. 198)

“The three nonsecure patterns of attachment research all reflect lower levels of psychological and neurological integration” (p. 205).

“Secure attachments represent the optimal balance of sympathetic and parasympathetic arousal, whereas their imbalance correlates with insecure attachment patterns such as fight or flight and splitting” (p. 206).

“We can hypothesize that many who engage in domestic violence, child abuse, and other forms of aggressive behavior may not have had the kinds of early attachment relationships required to build an adequate vagal system” (p. 234).

The existence and definition of self.

Influenced by D.W. Winnicott, Cozolino described self as developing during periods in childhood marked by calmness and being alone.

“Creating a quiet internal world allows for private thought, self-reflection, and traveling through time via episodic memory. Quiet moments can then serve as the grounds for mentalization, creativity, and consolidating the self” (Winnicott, 1958, as cited in Cozolino, 2010, p. 145).

Winnicott (1962) suggested that the ego and one’s sense of self consolidate during the periods of quiescence when children feel safe and calm in the presence of their parents. Good-enough parenting scaffolds the child, allowing him or her to go ‘inside’ and rest in imagination and the experience of self (Stern, 1985, as cited in Cozolino, 2010, p. 146)

Secure attachments and a sense of a safe world create the context for the development of the *true self*, which represents those aspects of the self that develop in the context of manageable (minor) impingements, support, encouragement, and proper meaning by the caretaker. Respect for the autonomy and separateness of the child motivates the parent to discover the child’s interests, instead of imposing his or her own upon them. (p. 191)

When self-involved or pathological parents use children for their own emotional needs, the child can become compulsively attuned to the parents, creating a false self designed to regulate the parents’ needs. Without appropriate assistance in developing his or her self-reflective capacity, such children live through reflexive social behavior and never learn that they have feelings and needs of their own that should be expressed and nurtured. (p. 192)

Self formed through narrative.

Narratives allow us to place ourselves within alternative points of view and increase our understanding of the experience of ourselves and others. We can escape our bodies in imagination to other possible selves, ways of being, and worlds that have yet to be created. Through stories we have the opportunity to

ponder ourselves in an objective way across an infinite number of contexts. In life and in therapy, we can use stories to imagine our problems happening to someone else or view ourselves at a distance (externalization). We can share versions of possible selves and receive input from others. Finally, we can experiment with new emotions, actions, and language to edit the scripts of our lives. . . . Our ability to edit narratives summons us to try on new ways of being. (p. 165)

Co-constructed narratives form the core of human groups, from primitive tribes to modern families. The combined participation of caretakers and children in narrating shared experiences organizes memories, embeds them within a social context, and assists in linking feelings, actions, and others to the self. (p. 207)

Narrative or “stories of the self” enables affect regulation.

“Autobiographical memory creates stories of the self capable of supporting affect regulation in the present and the maintenance of homeostatic functions into the future” (p. 47).

Self and imagination.

Narratives allow us to place ourselves within alternative points of view and increase our understanding of the experience of ourselves and others. We can escape our bodies in imagination to other possible selves, ways of being, and worlds that have yet to be created. Through stories we have the opportunity to ponder ourselves in an objective way across an infinite number of contexts. (p. 171)

“Because our imaginal capabilities have allowed for the construction of the self, we can also become anxious about potential threats to our psychological survival” (p. 240).

The existence and definition of mind.

Mind is how Freud chose to describe the brain.

Freud, the neurologist, became all but forgotten as his psychological theories moved further and further from their biological roots. He chose instead to utilize the more palatable and accessible metaphors of literature and anthropology to provide the primary vocabulary for psychoanalysis. Unfortunately, Freud’s shift from the brain to metaphors of mind opened psychoanalysis up to all sorts of criticism throughout the 20th century. Metaphors such as the Oedipal and Electra complexes were seen as contrived fictions, shielding them from scientific evaluation. Perhaps Freud anticipated that in the future, psychoanalysis would eventually be integrated with its neurobiological substrates. (pp. 4-5)

Although psychotherapy originally emerged from neurology, differences in language and worldview have limited collaboration among the two fields for most of the 20th century. While psychotherapists developed a rich metaphoric language of mind, neurologists built a detailed database of brain behavior relationships. As we approached the 21st century, neuroscience began providing us with tools to explore what happens in the brain during early development, and later in psychotherapy. A return to Freud's *Project* of a biological psychology is finally at hand. (p. 12)

The brain is what therapists have unknowingly been working with or describing while calling it mind.

“The similarity between hemispheric specialization and Freud’s notion of the conscious and unconscious mind has not been lost on psychotherapists” (p. 110).

The relationship between mind and brain.

Mind and brain are “a unified process.”

How does the brain give rise to the mind? Where do the brain and mind meet, and by what means do they interact with one another? These are difficult questions—so difficult, in fact, that the common reaction is to focus on either the mind or the brain and act as if the other is irrelevant (Blass & Carmeli, 2007; Pulver, 2003). The problem with this approach is the barrier it creates to understanding that the human experience of brain and mind is essentially a unified process (Cobb, 1944). Neurology and psychology are simultaneously pushed apart by academic and intellectual politics while being drawn together by their common psychobiological foundation. (Cozolino, 2010, p. 1)

Mind is “embedded” within processes of the brain.

Theories of psychological development by Winnicott, Freud, and others provide us with models for the development of mind embedded in these more basic neurobiological processes. The development of a sense of self requires periods of freedom from external threat and inner turmoil. It also requires the development of frontal-parietal systems responsible for inner imaginal space. (p. 196)

Mind might emerge from the brain.

“As our knowledge of neural networks expands, perhaps we gain a greater understanding of how the mind emerges from the wetware of the brain” (p. 132).

Certain states of mind might influence brain functioning.

The perception of control has been shown to reduce emotional arousal and stress. It is likely that cognitive processes involved in prediction and control activate frontal functioning and downregulate amygdala activation. In other words, thinking we have some control puts us in a state of mind that prepares us to think and activates prefrontal functioning, which reduces our emotionality. As a self-fulfilling prophecy, believing you are an efficacious person stimulates frontal activation, making you a more efficacious person. (p. 169)

Phrases that suggested mind and brain are not synonymous.

Ancient networks have been conserved, expanded, and reorganized, while new networks have emerged and combined to perform increasingly complex functions. In the process, some executive functions remained with earlier evolving networks, and some moved up to frontal and prefrontal regions, while still others were assumed by the mind and the social group. (p. 115)

“Further, stories link individuals into families, tribes, and nations and into a group mind linking each individual brain” (p. 164).

“These ways in which the brain and mind have evolved have created a wide variety of threats to our emotional and physical well-being” (p. 316).

The relationship between self and brain.

The extent of neural integration corresponds to the extent of psychological integration or coherence of self.

Numerous processing networks combine affect, sensation, behavior, and conscious awareness into an integrated, functional, and balanced whole—the neural substrate for what Freud called the ego. The ego is essentially shorthand for how the organization of the self comes to be expressed in dimensions such as personality, affect regulation, coping styles, and self-image. (p. 27)

Consciousness and identity are complex functions constructed from the contributions of multiple, primarily nonconscious, neural networks. Pathological states highlight the fact that the self is a fragile construction of the brain. Furthermore, there is considerable flexibility in the location, experience, and organization of the self within our imagination. (p. 286)

Left and right hemispheres of the brain correspond to distinct aspects of self.

The right hemisphere is generally responsible for both appraising the safety and danger of others and organizing a sense of the corporeal and emotional self (Devinsky, 2000). Appraisal simply means attaching a positive or negative association to a stimulus, while emotion is the conscious manifestation of this appraisal process (Fischer, Shaver, & Carnochan, 1990; Fox, 1991). The vast majority of appraisal occurs at an unconscious level. This is why the right hemisphere is more often associated with the unconscious mind, that is, what guides our thoughts and behavior outside of our awareness. (Cozolino, 2010, p. 97)

Gazzaniga (1989) later developed the concept of the *left hemisphere interpreter* that synthesizes available information and generates a coherent narrative for the conscious social self. The strategy of filling in gaps in experience and memory, and making a guess at an explanation, parallels confabulatory processes seen in patients with psychosis, dementia, and other forms of brain damage. *Confabulation* appears to be a reflexive function of the left hemisphere interpreter as it attempts to make sense of nonsense, organize experience, and present the self in the best possible light. This phenomenon is likely related to Freudian defense mechanisms that distort reality in order to reduce anxiety. (Cozolino, 2010, p. 103)

The parietal lobes of the brain contribute significantly to the experience of self.

It seems that the parietal lobes developed a parallel capacity for constructing and navigating a map of internal, imaginal space. . . . The parietal lobes' interconnections with the rest of the cortex allowed for the integration of working visual memory, attentional capacities, and bodily awareness necessary for these imaginal abilities. This suggests that our self-awareness was likely built in a stepwise manner during evolution through a series of overlapping 'maps'—first of the physical environment, then of self in environment, and later of self as environment. Thus, the growth of imaginal abilities allowed us to create an increasingly sophisticated inner topography. (p. 141)

“Damage to the parietal lobes disrupts the experience of location, self organization, and identity—in other words, who and where we are” (p. 142).

“These findings point to the fact that the parietal lobes are far more than sensory motor association areas, but are involved in the deployment of attention, understanding the environment, and constructing the experience of self” (p. 143).

There is also evidence to suggest that the parietal lobes participate in the creation of internal representations of the actions of others within us (Shmuelof & Zohary, 2006). In other words, we internalize others by creating representations of them in

our imaginations. This allows us to both learn from others and carry them with us when they are absent. These inner objects, as described in psychoanalysis, likely serve as the infrastructure of the construction and maintenance of our experience of self (Macrae et al., 2004; Tanji & Hoshi, 2001, as cited in Cozolino, 2010, p. 143).

Some sort of frontal-parietal network appears to be essential to our experience of self. Neural fibers connecting the middle portions of these two areas appear to serve a general integrative function of linking right and left hemispheres, limbic and cortical structures, as well as anterior and posterior regions of the cortex (Lou et al., 2004, as cited in Cozolino, 2010, p. 144)

The frontal-parietal network may be primarily responsible for the construction of the experience of self (Lou, Nowak, & Kajer, 2005). A properly functioning frontal-parietal network allows for the successful negotiation of our moment-to-moment survival and the ability to turn our attention to inner experience. . . . Without the ability to reflect on and sometimes cancel reflexive motor and emotional responses, there is little freedom. (Cozolino, 2010, p. 145)

We believe that early caretaking builds and shapes the cortex and its relationships with the limbic system, which supports emotional regulation, imagination, and coping skills. To this we now must add the development of the parietal lobes in the construction of internal space. (p. 146)

Winnicott's concept of true self describes neural integration and healthy psychological development.

Winnicott (1962) suggested that the ego and one's sense of self consolidate during the periods of quiescence when children feel safe and calm in the presence of their parents. Good-enough parenting scaffolds the child, allowing him or her to go "inside" and rest in imagination and the experience of self (Stern, 1985). This may serve as an important mechanism of the transmission of neural organization from parent to child. It is rare to find a child who is able to be still and centered and feel safe in the presence of chaotic adults. We believe that early caretaking builds and shapes the cortex and its relationships with the limbic system, which supports emotional regulation, imagination, and coping skills. To this we now must add the development of the parietal lobes in the construction of internal space. (Cozolino, 2010, p. 146)

The true self reflects our ability to tolerate negative feelings and integrate them into conscious awareness and to seek out what feels right for us in our activities, ourselves, and our relationships with others. Winnicott's true self is obviously one in which neural network development has been maximized, affect is well regulated, and emotions and cognition are well integrated. The true self reflects an

open and ongoing dialogue among the heart, the mind, and the body. (Cozolino, 2010, p. 191)

Self and contemporary problems of the self both result from how the brain evolved to allow for imagination.

With the expansion of the cerebral cortex and the emergence of imagination, we have become capable of being anxious about situations we will never experience. We can now worry about monsters living under our beds and the incineration of the earth resulting from the sun's expansion. Because our imaginal capabilities have allowed for the construction of the self, we can also become anxious about potential threats to our psychological survival. Psychotherapists deal with a wide variety of anxiety disorders based in the fear of social death. The expectation of rejection by another can result in social withdrawal; the fear of forgetting one's lines in a play can result in stage fright. Systems of physical survival have been conserved in the evolution of consciousness and the ego, to be triggered when threats to these abstract constructions are activated. (p. 240)

The ways in which the brain interprets social interactions contributes to a sense of self.

The internal emotional associations linked to mirror circuitry are activated via outwardly expressed gestures, postures, tone, and other pragmatic aspects of communication. Thus, our internal emotional state—generated via automatic mirroring processes—can become our intuitive “theory” of the internal state of the other. These structures are at the core of our ability to develop intimate relationships, be attuned to one another, and aid our children in shaping a healthy and balanced sense of self. (p. 189)

Neural integration enables self to be experienced as embodied.

“An organized sense of the body in space and the embodied self form in subcortical and cortical networks involving the thalamus, cerebellum, and parietal cortex” (p. 95).

“The right hemisphere is generally responsible for both appraising the safety and danger of others and organizing a sense of the corporeal and emotional self” (Devinsky, 2000, as cited in Cozolino, 2010, p. 97).

Language and narrative foster neural integration, thereby enabling a coherent experience of self.

Putting feelings into words and constructing narratives about our experiences are integral to emotional regulation, the interweaving of neural networks of emotion and cognition, and the experience of a coherent sense of self. Perhaps most important, a lack of language can separate us from the healing effects of positive connections with others. The loss of the ability to construct narratives is especially problematic in situations where individuals are forced into silence by their abusers, or after enduring the “unspeakable horrors” of torture, war, or the death of friends and family. (p. 306)

Self-reflection facilitates neural integration.

“The relationship between coherence and reflective self-functioning is powerful, and that the ability to reflect on the self plays an important role in the integration of multiple processing networks of memory, affect regulation, and organization” (p. 208).

Narratives foster neural integration which enables affect regulation.

Autobiographical memory creates stories of the self capable of supporting affect regulation in the present and the maintenance of homeostatic functions into the future. Memory, in this form, may maximize neural network integration as it organizes vast amounts of information across multiple processing tracks. Thus, language is an important tool in both neurological and psychological development. (p. 47)

The relationship between self, mind, and brain.

Exemplary of his self-mind-brain integration was Cozolino’s depiction of the relationship between the right hemisphere of the brain, the “unconscious” mind, and physical and emotional aspects of self.

The right hemisphere is generally responsible for both appraising the safety and danger of others and organizing a sense of the corporeal and emotional self (Devinsky, 2000). Appraisal simply means attaching a positive or negative association to a stimulus, while emotion is the conscious manifestation of this appraisal process (Fischer, Shaver, & Carnochan, 1990; Fox, 1991). The vast majority of appraisal occurs at an unconscious level. This is why the right

hemisphere is more often associated with the unconscious mind, that is, what guides our thoughts and behavior outside of our awareness. (Cozolino, 2010, p. 97)

Neurobiological mechanisms of effective psychotherapy.

The ability to alter gene expression.

This gets us back to the old nature-nurture debate and the question: What do we inherit, and what do we learn from experience? Our best guess is that almost everything involves an interaction between the two. While we inherit a template of genetic material (genotype), what gets expressed (phenotype) is guided by noncoded genetic information that is experience dependent. . . . So while template genetics may guide the early formation of the brain during gestation, the regulation of gene expression directs its long-term development in reaction to ongoing adaptation to the social and physical worlds. . . . As therapists, we attempt to reprogram these neural systems via a supportive relationship and the techniques we bring to bear during treatment. In other words, we are using epigenetics to change the brain in ways that enhance mental and physical well-being. (pp. 64-65)

Neural plasticity.

The growth and connectivity of neurons is the basic mechanism of all learning and adaptation. Learning can be reflected in neural changes in a number of ways, including changes in the connectivity between existing neurons, the expansion of existing neurons, and the growth of new neurons. All of these changes are expressions of *plasticity*, or the ability of the nervous system to change in response to experience. (p. 17)

Neural integration.

From the perspective of neuroscience, psychotherapy can be understood as a specific kind of enriched environment designed to enhance the growth of neurons and the integration of neural networks. The therapeutic environment is individually tailored to fit the symptoms and needs of each client. I propose here that all forms of therapy, regardless of theoretical orientation, will be successful to the degree to which they foster appropriate neuroplasticity. (p. 25)

“Whether it is called symptom relief, differentiation, ego strength, or awareness, all forms of therapy are targeting dissociated neural networks for integration” (p. 46).

I postulated earlier that neural network integration should correlate with mental health, while dissociation or imbalance among neural networks should correlate

with mental illness. If this is true, we can assume that integration between the right and left hemispheres is one elements of optimal brain functioning. It turns out that anxiety, affective disorders, psychosis, alexithymia, and psychosomatic conditions have all been linked to deficits in the integration and balance among the cerebral hemispheres. (p. 106)

Although the executive areas of the brain are traditionally thought of as being responsible for our rational abilities, they actually combine sensory, motor, memory, and emotional information to shape ideas, plans, and actions. This broader view of executive functioning has been guided, in part, by an increasing appreciation of the contribution of emotion and intuition in decision making (Damasio, 1994). Because so much of brain functioning is unconscious, nonverbal, and hidden from conscious observation, the executive brain is also strongly influenced by nonconscious processes. Psychotherapy calls on the executive brain to update and reorganize the relationship among the conscious and unconscious networks they oversee in the service of mental and physical health. (Cozolino, 2010, p. 116)

New learning alters the effects of memories on psychological functioning or subjective experience.

This mosaic of firing patterns, the networks' *instantiation*, will determine which set of output neurons fire. . . . Instantiations are sculpted by experience and encode all of our abilities, emotions, and experiences into one or more forms of memory. It is the consistency of these firing patterns that results in organized patterns of behavior and experience. Once these neural patterns are established, new learning modifies the relationship of neurons within these networks. (p. 16)

“The process of psychotherapy is totally dependent upon memory. From what we know of clients' past and current lives, to their ability to bring the lessons of therapy into practice, everything depends on their ability to learn and remember” (p. 73).

Given that memory is encoded among neurons and within neural networks, the malleability of memory is an observable manifestation of the plasticity of these neural systems. . . . But from the perspective of psychotherapy, this plasticity provides an avenue to the alteration of destructive memories. Revisiting and evaluating childhood experiences from an adult perspective often leads to rewriting history in a creative and positive way. The introduction of new information or scenarios to past experiences can alter the nature of memories and modify affective reactions. (p. 89)

Psychological mechanisms that enable neurobiological mechanisms of effective therapy to occur.

Four broad conditions common to successful therapies.

From the perspective of neuroscience, psychotherapy can be understood as a specific kind of enriched environment designed to enhance the growth of neurons and the integration of neural networks. The therapeutic environment is individually tailored to fit the symptoms and needs of each client. I propose here that all forms of therapy, regardless of theoretical orientation, will be successful to the degree to which they foster appropriate neuroplasticity. Further, I also propose that neural plasticity, growth, and integration in psychotherapy are enhanced by:

1. The establishment of a safe and trusting relationship
2. Mild to moderate levels of stress
3. Activating both emotion and cognition
4. The co-construction of new personal narratives.

(pp. 24-25)

Language and narrative.

“Narratives co-constructed with therapists provide a new template for thoughts, behaviors, and ongoing integration” (pp. 26-27).

“In editing our narratives, we change the organization and nature of our memories and, hence, reorganize our brains. This is a central endeavor in many forms of psychotherapy” (p. 92).

“The integrative properties of language may be unequalled by any other function of the brain. Creating and recalling a story requires the convergence of multisensory emotional, temporal, and memory capabilities that bridge all vectors of neural networks” (p. 102).

“A primary tool across all models of therapy is editing and expanding the self-narrative of the left hemisphere to include the silent wisdom of the right” (p. 110).

Narratives allow us to place ourselves within alternative points of view and increase our understanding of the experience of ourselves and others. We can escape our bodies in imagination to other possible selves, ways of being, and worlds that have yet to be created. Through stories we have the opportunity to ponder ourselves in an objective way across an infinite number of contexts. In life and in therapy, we can use stories to imagine our problems happening to someone else or view ourselves at a distance (externalization). We can share versions of possible selves and receive input from others. Finally, we can experiment with

new emotions, actions, and language to edit the scripts of our lives. . . . Our ability to edit narratives summons us to try on new ways of being. (p. 165)

Much of therapy consists of uncovering and exploring reflexive social language and internal dialogue, both of which reflect unconscious aspects of the self. In this process we develop the *language of self-reflection*, learning that we are not only our social reflexes plus the voices that haunt us but are also the one that can observe, listen, and judge what we hear these voices say. As the language of self-awareness is expanded and reinforced, we learn we are capable of evaluating and choosing whether to follow the expectations of others and the mandates of our childhoods. The language of self-reflection. . . most likely reflects a higher level of integration. In this language, cognition is blended with affect so that there can be feelings about thoughts and thoughts about feelings. At a very deep level, this language leads us to meditation, where we learn to quiet our thoughts and move beyond words. (p. 171)

Create a nurturing and supportive therapeutic relationship that facilitates secure attachment.

Our brains are capable of continual adaptation in both positive and negative directions and. . . successful psychotherapy, one that establishes a nurturing relationship, may well be capable of triggering genetic expression in ways that can decrease stress, improve learning, and establish a bridge to new and healthier relationships. (p. 223)

As in early development, the repeated exposure to stress in the supportive interpersonal context of psychotherapy results in the ability to tolerate increasing levels of arousal. This process reflects the building and integration of cortical circuits and their increasing ability to inhibit and regulate subcortical activation. Affect regulation, especially the modulation and inhibition of anxiety and fear, allows for continued cortical processing in the face of strong emotions, allowing for ongoing cognitive flexibility, learning, and neural integration. In this process the therapist plays essentially the same role as a parent, providing and modeling the regulatory functions of the social brain. (p. 21)

Networks of our complex social brains include brain regions, neural systems, and regulatory networks. . . . These are the same circuits that therapists attempt to influence in reshaping the brain in ways which lead to more positive adaptation later in life. The idea that psychotherapy is a kind of reparenting may be more than a metaphor; it may be precisely what we are attempting to accomplish at the level of the epigenome. This research establishes attention, care, and nurturance as a way to influence the very structure of our brain and places psychotherapy at the heart of biological interventions. (p. 227).

An appropriate amount of stress helps patients learn to regulate their own affect.

Mild to moderate stress (MMS) activates neural growth hormones. . . . Thus, MMS may be utilized to enlist naturally occurring neurobiological processes in the service of new learning. Although we use the term *stress* in animal research, humans also demonstrate arousal in the form of curiosity, enthusiasm, and pleasure. Humans can also be motivated to learn new skills and take on new challenges to relieve discomfort and stress. These motivational states have all been recognized for their role in successful outcomes from psychotherapy. (p. 20)

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“Assistance with experiencing increasing levels of positive and negative affect is a vital component of both parenting and psychotherapy” (p. 23).

How therapists should provide psychotherapy.

Common interventions across established psychotherapy models that stimulate neuroplasticity.

Although psychotherapists do not generally think in “neuroscientific” terms, stimulating neuroplasticity and neural integration is essentially what we do. We provide information to clients about our understanding of their difficulties in the form of psychoeducation, interpretations, or reality testing. We encourage clients to engage in behaviors, express feelings, and become conscious of aspects of themselves of which they may be unaware. We dare them to take risks. We guide them back and forth between thoughts and feelings, trying to help them establish new connections between the two. We help clients alter their descriptions of themselves and the world, incorporating new awareness and encouraging better decision making. With successful treatment, the methods being used are internalized so that clients can gain independence from therapy and we do this all in the context of a warm, supportive, committed, and consistent relationship. These same factors are at play across psychodynamic, systems, and cognitive-behavioral approaches to treatment. (p. 26)

Psychotherapists are applied neuroscientists who create individually tailored enriched learning environments designed to enhance brain functioning and mental health. We are skilled at teaching clients to become aware of unconscious processing, take ownership of their projections, and risk anxiety in the service of emotional maturation (Holtforth et al., 2005). In our work, illusions, distortions, and defenses are exposed, explored, and tested or modified with understandings closer to reality. Implicit memory—in the form of attachment schemas, transference, and superego—are made conscious and explained as expressions of early experiences. We use a combination of empathy, affect, stories, and behavioral experiments to promote neural network growth and integration. (Cozolino, 2010, p. 341)

Consider how the brain distorts thinking and listen for what is not being talked about.

Another way of describing therapy from the perspective of laterality is that we teach clients a method by which they can learn to attend to and translate right hemisphere processing into left hemisphere language. We teach them about the limitations and distortions of their own conscious beliefs presented by their left hemisphere interpreter. . . . This is why reality testing is so important for treatment success. It is the therapist's job to hear what is not said, resonate with what the client is unable to consciously experience, and communicate it back to him or her in a way that will allow it to become integrated. This human process serves hemispheric integration. (p. 111)

Attribute psychological symptoms to the brain or body in order to depathologize them and to engender a sense of control for patients.

On a practical level, adding a neuroscientific perspective to our clinical thinking allows us to talk with clients about the shortcomings of our brains instead of the problems with theirs. The truth appears to be that many human struggles, from phobias to obesity, are consequences of brain evolution and not deficiencies of character. Identifying problems that we hold in common and developing methods to circumvent or correct them is a solid foundation upon which to base a therapeutic alliance. (p. 356)

Identify the congruence between a patient's cognition and affect.

When patients come to therapy, the left hemisphere interpreter tells its story. But something is usually wrong: the story does not fully account for what is happening in their lives. The narratives that organize their identities inadequately account for their experiences, feelings, and behaviors. The right hemisphere also speaks via facial expressions, body language, emotions, and attitudes. Thus, we

listen to both stories for the congruence between the verbal narrative, and nonverbal and emotional communication. In this process, we analyze the integration and coherence of left-right and top-down neural networks. A primary tool across all models of therapy is editing and expanding the self-narrative of the left hemisphere to include the silent wisdom of the right. (p. 110)

Using narratives in a way that puts feelings into words and engenders emotional regulation and a sense of control.

Consider what we do when we assist clients in shifting from their own perspective to looking at a situation from another point of view, to thinking about the situation once again from a more objective perspective. We are calling upon the omfpc and dlpc in different ways as we attempt to guide them to a more holistic perspective of a life situation. (p. 161)

Putting feelings into words (affect labeling) has long served a positive function for many individuals suffering from stress or trauma. . . . The narrative, which simultaneously activates an array of networks, enhances metabolic activity and neural balance. The perception of control has been shown to reduce emotional arousal and stress. It is likely that cognitive processes involved in prediction and control activate frontal functioning and downregulate amygdala activation. (pp. 168-169)

Therapy attempts to create this metacognitive vantage point from which the shifting states of mind that emerge during day-to-day life can be thought about. This is accomplished by interweaving the narratives of client and therapist and hopefully leading them in a more healthful direction. You begin by making clients aware of one or more of the narrative arcs of their life story and then help them understand that change is possible and offering alternative story lines. As the editing process proceeds, new narrative arcs emerge, as do possibilities to experiment with new ways of thinking, feeling, and acting. (p. 171)

Make interpretations, analyze projection, and discuss whatever is dissociated or not being talked about.

“It is the therapist’s job to hear what is not said, resonate with what the client is unable to consciously experience, and communicate it back to him or her in a way that will allow it to become integrated” (p. 111).

Therapists employ the projective hypothesis to explore the architecture of their clients’ unconscious. . . . Most forms of psychotherapy attempt to shine the light of conscious awareness on belief perseverance and attribution biases, and undermine the conservative nature of the hidden layers. Others engage in a deep

exploration of the dynamic unconscious, defenses, and primitive emotional states. By encouraging clients to be open to new ideas, explore the connections within their hidden layers, and take responsibility for positive change, we challenge them to reorganize the neural networks of their hidden layers. (p. 138)

In making an interpretation, the therapist points out an unconscious aspect of the patient's experience, such as a defense he or she is using to avoid negative feelings. . . . When an interpretation is accurate and delivered in an appropriate and well-timed manner, a number of things occur. The client generally becomes quiet; there may be a change in facial expressions, posture, and tone of voice. Very often the client will begin to fully experience the emotions against which he or she was defending. (pp. 294-295)

“In therapy, we teach our clients to ask themselves if the pot is calling the kettle black: that is, are their thoughts and feelings about others autobiographical?” (p. 315).

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Indicators of successful psychotherapy outcomes.

Neural integration.

Psychotherapy can be thought of as a specific type of enriched environment that promotes social and emotional development, neural integration, and process complexity. The way the brain changes during therapy will depend upon the neural networks involved in the focus of treatment. (p. 20)

“I propose here that all forms of therapy, regardless of theoretical orientation, will be successful to the degree to which they foster appropriate neuroplasticity” (p. 25).

Less dissociation or greater integration.

Dissociation is a common result of the high levels of stress associated with traumatic experiences. Characterized by a disconnection among thoughts, behaviors, sensations, and emotions, dissociation demonstrates that the coordination and integration of these functions is an active neurobiological process. Because all of these functions are seamlessly and unconsciously interwoven during normal states of awareness, it is easy to overlook the fact that their integration is a central component of mental health. (p. 21)

Symptom reduction.

There is a recognition that the evocation of emotion coupled with conscious awareness is most likely to result in symptom reduction and personal growth. Whether it is called symptom relief, differentiation, ego strength, or awareness, all forms of therapy are targeting dissociated neural networks for integration. (p. 46)

Traumatic experiences result in a variety of well-understood physiological and psychological reactions to threat, which cause a number of predictable symptoms to emerge. These symptoms tend to gradually diminish after the resolution of the traumatic situation, as we gather support from others, and repeatedly talk through the experience. These conditions allow us to regain both neurobiological homeostasis and a sense of emotional control. (pp. 262-263)

Affect regulation.

Increased integration results in tolerating and experiencing thoughts and emotions previously inhibited, dissociated, or defended against. Affect regulation may be the most important result of the psychotherapeutic process across orientations, because it allows for a reconnection with the naturally occurring salubrious experiences in life. (p. 47)

Secure attachment.

“Throughout our lives, but especially during childhood, relationships with others regulate our stress and fear. A secure attachment indicates that we have learned to successfully utilize our relationships with others to quell our fears and modulate our arousal” (p. 233).

Ego strength and higher-order defenses.

Ego strength, or our ability to navigate reality with a minimum of defensiveness, reflects the integration of neural networks of emotion and thought, and the development of mature defenses. The more primitive or immature the defense mechanism, the more reality is distorted and the more functional impairment occurs. . . . Mature defenses, like sublimation or humor, allow us to assuage strong feelings, keep in contact with others, and remain attuned to a shared social reality. (p. 34)

“Secure attachment and ego strength are correlated with our ability to hear feedback, accept our own limitations, and use less reality-distorting defenses—humor instead of repression and sublimation instead of denial” (p. 316).

Self-reflective language.

“When clients shift to the language of self-reflection, the changes in their tone, manner, and mood are palpable. I imagine at this moment that clients have the clearest perspective on their thoughts, behaviors, and feelings” (p. 173).

Earned autonomy and avoiding pathological caretaking of others.

“Earned autonomy is convincing evidence that early negative experiences can be reinstated and repaired later in life. Personal growth has the ability to heal because the social brain remains plastic” (p. 209).

Appendix B

Further Examples of Rhetorical Strategies in

The Neuroscience of Psychotherapy: Healing the Social Brain (Cozolino, 2010)

Human development metaphors used to describe the brain.

“At the same time, middle portions of the prefrontal cortex are maturing and integrating with subcortical structures to establish the basic structures of emotional regulation and attachment” (p. 95).

“The corpus callosum begins to develop at the end of the first year, is significantly developed by age 4, and continues to mature past the age of 10” (p. 95).

“At birth, the human brain is dependent on caretakers for its survival and growth” (p. 216).

Technology Metaphors.

“The right hemisphere is heavily wired to the limbic system” (p. 97).

“Through countless adaptational challenges and the process of natural selection, we find ourselves with staggeringly intricate and sophisticated brains: Ferraris—not fords” (p. 115).

“The control of the vast majority of our bodily and mental functions is on automatic pilot” (p. 115).

“This carryover of past learning into the present where it may be irrelevant or destructive is certainly one of the contemporary human brain’s design flaws” (p. 136).

“It seems that the parietal lobes developed a parallel capacity for constructing and navigating a map of internal, imaginal space” (p. 141).

“High levels of cortisol, dopamine, and bottom-up inhibition from the amygdala can all take the prefrontal cortex ‘off-line’ during stress” (p. 157).

“Much of neural integration takes place in the association areas of the frontal, temporal, and parietal lobes, which serve to coordinate, regulate, and direct multiple neural circuits. They are our conscious switchboard operators” (p. 164).

“Now she was sharing the content of her internal dialogue, likely programmed early in life” (p. 173).

“The right-hemisphere-biased circuits of the social brain come online at birth” (p. 182).

“Genes first serve to organize the brain and trigger sensitive periods, while experience orchestrates genetic transcription in the ongoing adaptive shaping of neural systems, so that experience becomes the actual hardware of our brains” (p. 216).

“*Environmental programming* is a term used to describe this orchestration of epigenetic factors” (p. 217).

“Although we are genetically programmed to become anxious about things like snakes or abandonment, fear can be learned by pairing any thought, feeling, or sensation with a noxious stimulus” (p. 245).

“NE activation makes us become vigilant, scan for danger, and maintain a posture of tense readiness. It also heightens our memory for danger, creating a sort of ‘print now’ command for amygdala memory circuits” (p. 249).

“On the other hand, evolution has also provided us with caretakers who allow us to link into their developed cortex until our own is ready” (p. 253).

“We mature into self-awareness having been programmed by early experience with sensory and emotional assumptions that we accept as truth” (p. 309).

Building and infrastructure metaphors.

“Mirror neurons may bridge the gap between sender and receiver, helping us understand one another” (p. 188).

“Keep in mind that, just as in rats, these systems are also built by the attachments they come to control. Thus, our learning history comes to be reflected in the architecture of our neural systems” (p. 228).

“The caretaking and resonance behaviors made possible by the cingulate also provide an important component of the neural infrastructure for social cooperation and empathy” (p. 229).

“The insula begins life on the lateral surfaces of the brain, only to become hidden by the rapid expansion of the frontal and temporal lobes” (p. 229).

“The hippocampus is constantly remodeled to keep abreast of current environmental changes” (p. 254).

Personification.

“Although most neural processing requires the contribution of both hemispheres, there are situations when the hemispheres not only think differently but also compete with one another” (p. 93).

“Overall, the left side of the brain appears to be in charge of the successful navigation of the social world” (p. 98).

“This allows each human brain to be a unique blending of nature and nurture as it builds its structures through interactions and molding itself to its environment” (p. 216).

“In essence, rats who receive more maternal attention have brains that are more robust, resilient, and nurturing of others” (p. 218).

“In interpersonal situations, our amygdala reflexively and unconsciously appraises others in the context of our past experiences” (p. 244).