Introduction

Shakespeare's Brain: Embodying the Author-Function

Did Shakespeare have a brain? "In proposing this slightly odd question, I am conscious of the need for an explanation." Readers may recognize my second sentence as the first sentence of Michel Foucault's "What Is an Author?" an essay that established its redefinition of an author as "a complex and variable function of discourse" so successfully that it is my question, and not Foucault's, that now seems odd.[1] Earlier critics used to assume, of course, that Shakespeare had a *mind*. G. Wilson Knight, for example, could argue that the "imaginative atmosphere" of *Timon of Athens* "seems to reflect the peculiar clarity and conscious mastery of the poet's mind."[2] Knight's sense that Shakespeare's mind was both clear and masterful represents the kind of authorial control over a text that Foucault was particularly at pains to question. Psychoanalytic critics still assume that Shakespeare possessed the Freudian apparatus of conscious and unconscious minds, but the centrality of the unconscious mind to this approach allows these critics to avoid the assumptions about clarity and control that trouble other author-centered criticisms.[3] The implications of a Shakespearean brain, however, have been almost entirely overlooked.

Shakespeare provides a particularly appropriate test case for a literary theory that purports to offer a new way of conceiving authorship, especially one that challenges the Foucauldian deconstruction of the author in several ways. Shakespeare enjoys a status in popular culture, in the Anglophone world and even beyond, as perhaps *the* archetypal author; the very nature and process of his authorship forms the subject of a recent popularly successful film. However, Foucauldian theory, along with a new emphasis on the collaborative nature of play production in early modern England, has led Shakespearean scholars to form more complex and qualified notion of Shakespearean authorship. A focus on Shakespeare's brain allows us to attend to Shakespeare as author without losing the complexity offered by contemporary theory.

Using a cognitive literary and cultural theory derived from the cognitive sciences, I want to try to reintroduce into serious critical discourse a consideration of Shakespeare's brain as one material site for the production of the dramatic works attributed to him. Current cognitive science offers the grounds for a number of theories of human subjectivity and language

that are beginning to be reformulated in ways that make them readily applicable to the reading of literary and cultural texts. Virtually all branches of cognitive science are centered on investigation of the ways in which the mind (the conscious and unconscious mental experiences of perception, thought, and language) is produced by the brain and other bodily systems.[4] A literary theory derived from cognitive science, then, offers new ways to locate in texts signs of their origin in a materially embodied mind/brain. From this perspective, I argue that at least several of Shakespeare's plays experiment with different forms of polysemy and prototype effects in ways that leave traces of cognitive as well as ideological processes in the text. Further, I show how these traces of cognitive process reveal not only the possibilities but also the limits of individual agency within a biological body and a cultural matrix. I suggest that cognitive theory offers new and more sophisticated ways to conceive of authorship and therefore offers new ways to read texts as products of a thinking author engaged with a physical environment and a culture.

Cognitive theory has provided a number of approaches to literary texts, but my emphasis here is on the spatial patterns and structures, derived from early experiences of embodiment, which at least some cognitive scientists posit as the bases of human thought and language.[5] I argue that in each of the plays examined here a network of words, connected in part by spatial metaphors, functions as a structural element that reflects in its outlines some of the patterns and connections of Shakespeare's mental lexicon. I believe that Shakespeare uses these words as focal points for explorations of the spatially centered experiences of cognitive subjectivity, as it figured in the development of the "individual" in the early modern period and as those new individuals were represented by fictional characters on the space of the platform stage. In many ways the plays are as much about the coming into being of cognitive subjects in a variety of environments as they are about the construction of cultural subjects by a variety of discursive formations; the plays represent what it is like to conceive of oneself as an embodied mind, along with all of the problems and dilemmas that condition entails.

As F. Elizabeth Hart argued recently, contemporary materialist theory remains haunted by lingering and unacknowledged formalisms inherited from Saussure and Derrida.[6] A corollary of this foundational formalism, to which I will return, is the tendency of many recent materialist critics to assume that the physical reality of Shakespeare's body had little relevance to the texts of his plays. Following Foucault, they disperse the Shakespearean body into an immaterial author-function, occluding Shakespeare's material existence in time and space. As Graham Holderness, for example, suggests, "These plays were made and mediated in the interaction of certain complex material conditions, of which the author

was only one." The consequence of this realization, however, has not been to consider the place of the author as one material condition among many; instead it has been to "deconstruct the Shakespeare myth" in order to discover "a collaborative cultural process" in which the role of the writer is effectively written out.[7] Examination of authorship as "a collaborative cultural process" has, in fact, proceeded along the lines suggested by Foucault, with questions about authorship shifted to such broader questions as, "What are the modes of existence of this discourse? Where does it come from; How is it circulated; Who controls it? What placements are determined for possible subjects?" (138).

Now, questions such as these have become common starting points for several approaches to Shakespearean and other early modern texts. One especially valuable kind of study has pursued the implications of the collaborative nature of textual production in the Elizabethan and Jacobean theater and in the preparation of printed texts of the plays. Margreta de Grazia and Peter Stallybrass, for example, have argued that acknowledging "the materiality of the Shakespearean text" leads to an interrogation of "the category of the single *work*," that of "the discrete *word*," "the unified *character*, who utters the word, and the autonomous *author*, who is credited with the work."[8] They quite rightly point out the many ways in which the Shakespearean text is fractured and multiple, a product of a "collaborative field" rather than a single controlling genius. Their conclusion, however, is strikingly similar to Foucault's: they end with an almost identical call to dethrone the "solitary genius immanent in the text," which is, "after all, an impoverished, ghostly thing compared to the complex social practices that shaped, and still shape, the absorbent surface of the Shakespearean text."[9]

Although Stallybrass and de Grazia break new ground in applying Foucault's insights more specifically to the processes of textual editing, the trajectory of their article essentially retraces Foucault's well-worn path and ends in the same place. It cannot get beyond this point, I would argue, because assuming a "ghostly" author involves denying the presence of a material human body as a central participant in the "complex social practices" shaping the text.[10] And if the presence of the author is denied or circumscribed in this way, then any discussion of the nature of the social practices involved must be prematurely truncated.[11] If we refuse to see the author at all, then the questions raised by Foucault can never be answered, only endlessly rediscovered and rearticulated.

Even Stephen Greenblatt finds his circulation of social energy in textual traces rather than in the processes of producing a text. He similarly begins with the concept of a total artist, "at the moment of creation complete unto himself," and makes the expected move of rejecting him.[12] He too rediscovers the "collective production of literary pleasure and interest,"

locating that collectivity on the even more basic level of "language itself" as "the supreme instance of a collective creation" (4). His rejection of admiration for the "total artist" in favor of the "study of the collective making of distinct cultural practices and inquiry into the relations among these practices" (5) leads to a by now familiar set of questions: "We can ask how collective beliefs and experiences were shaped, moved from one medium to another, concentrated in manageable aesthetic form, offered for consumption." (5). Greenblatt's use of the passive voice here signals his desire to avoid acknowledging the materiality of the author, for in strictly material terms it was the author's hand that physically "shaped" letters on the page, the author's eyes that scanned treatises on exorcism, the author's brain that directed the transfer of bits of them to his own texts, the author who "concentrated" these bits into an aesthetic form and received payment when they were offered for consumption.[13]

Recently there has been a salutary emphasis on the importance of the material body in the early modern period; however, the body and especially the brain of the author have been signally absent from such studies, largely because of the continuing influence of Foucault and Althusser on theories of embodiment and subject formation. In *The Tremulous Private Body*, Francis Barker offered a Foucauldian argument that the early modern period saw a process through which the body was "confined, ignored, exscribed from discourse" in the interests of the formation of a disciplined and disembodied bourgeois subject.[14] Recent work on the body has complicated and problematized Barker's account, in most cases without eschewing the Foucauldian position that the body is a product of discourse and that the early modern experience of embodiment was constructed by the dominant classed and gendered discursive formations of the period. Jonathan Sawday, for instance, has argued that the Renaissance might be described as a "culture of dissection" that "promoted the beginnings of what Michel Foucault has analyzed as the 'surveillance' of the body within regimes of judgement and punishment."[15] Gail Kern Paster has similarly traced, in remarkable detail, the influence of the prevailing early modern theories of humoral physiology on the experience of embodiment as depicted in drama of the period, especially as it supported "continuous interpellation of the subject" based on "an internal orientation of the physical self within the socially available discourses of the body," especially discourses of class and gender.[16]

Certainly, the effects of discourse in shaping perceptions of the body cannot be denied. As Paster argues, "No matter what the physical facts of any given bodily function may be, that function can be understood and experienced only in terms of culturally available discourses," so that "the interaction between bodily self-experience and its discursive realization . . . takes place in and through culture or its more politically conceptual-

ized cognate, ideology" (4). However, this new scrutiny of bodily experience in relation to discourse has paid relatively little attention to the brain, the material place within the body where discourse is processed and therefore where discursive construction, if it occurs, must be located.[17] This may well be because the formative theories of Foucault and Althusser provide little sense of the actual processes through which discourse becomes embodied within the human brain. As Judith Butler has remarked, Foucault "does not elaborate on the specific mechanisms of how the subject is formed in submission. Not only does the entire domain of the psyche remain largely unremarked in his theory, but power in this double valence of subordinating and producing remains unexplored."[18] Butler similarly notes that Althusser's influential account of interpellation is presented, not literally (as it might occur within the subject), but as a staged "social scene" (the hailing policeman) that appears to be "exemplary and allegorical" (106).[19] And Butler herself, in attempting to use psychoanalysis to understand the mechanics of subject formation missing in the accounts of Foucault and Althusser (and reciprocally to use Foucault and Althusser to provide a critique of psychoanalysis), takes up the Marxist and psychoanalytic terms for the location of the subject and the subjectifying process—*soul*, *psyche*, *ego*—but never considers the brain as the material site where discourse enters the body, where entry into the symbolic occurs, and therefore where the subject is constructed.

Scott Manning Stevens, in an essay tracing the seventeenth-century controversy over whether the heart or the brain was to be considered the seat of the soul and thus of the self, suggests that the heart remained a central popular and religious symbol of selfhood even after medical discourse began to recognize its location in the brain because "the brain . . . seems tied to its own physicality and function, oddly separate from the more evocative term 'mind.' " Stevens argues that modern critics (like seventeenth-century writers) "may be simultaneously protective of the singularity of an individual brain while fearing that a deeper understanding of its functions will reduce mental life to a biological phenomenon (albeit wondrous) and not a spiritual mystery."[20] For Foucault and Althusser, it is perhaps power itself, and the processes through which it takes discursive form and penetrates the subject, that must remain mysterious, indeed mystified, a mystification that might be threatened by considering how discourse is materially processed inside the brain.

It is this failure to think about the brain that prevents most contemporary accounts of subject formation in the body from noting that just as surely as discourse shapes bodily experience and social interactions shape the material structures of the brain, the embodied brain shapes discourse. Terence Deacon argued recently that the human brain and language have evolved together, each exerting a formative pressure on the other. He sug-

gests imagining "language as an independent life form that colonizes and parasitizes human brains, using them to reproduce."[21] Deacon notes that "the relationship between language and people is symbiotic" and that "modern humans need the language parasite in order to flourish and reproduce, just as much as it needs humans to reproduce. Consequently, each has evolved with respect to the other. Each has become modified in response to the peculiar constraints and requirements of the other" (112–13). Thus, although Deacon acknowledges the powerful force of culturally shared symbolic systems in shaping our sense of self, he also describes in detail the processes through which the physiological constraints of the human brain have shaped our linguistic and symbolic systems.[22]

While Deacon makes his arguments on an evolutionary scale, focusing on the long cohistory of language and the brain, critics like Elaine Scarry and N. Katherine Hayles have argued that individual subjects have a prediscursive experience of embodiment that cannot be assimilated into discourse.[23] Wilma Bucci provides a particularly useful synthesis of work by a number of cognitive scientists to summarize the position that "we can identify a prelinguistic stage in the thought development of the human child" wherein, through "perceptual analysis" of sensory experiences in the world, a child forms concepts "through image-schemas based on spatial structures."[24] Because most of our thought seems inextricably bound up with language, it may be hard to imagine that one can exist without the other. However, evidence for the existence of pre- or nonverbal mental function takes many forms; Roger Shepard and Jacqueline Metzler's work on the mental rotation of three-dimensional objects provides a particularly clear example. They found that subjects who were asked to determine whether drawings of three-dimensional objects represented different orientations of the same object used a process of mental rotation, rather than logical or verbal analysis, to solve the problem.[25] The cognitive psychologist Jean Mandler, who developed the theory of perceptual analysis, emphasizes that preconceptual image schemas are not accessible to consciousness, since "no language of thought is directly accessible," and that they are not concrete, picturelike images but "dynamic analog representations of spatial relations or movements in space" that form a kind of "architecture" of thought: "its meaning resides in its own structure," which can then be mapped onto conscious images and eventually language.[26] George Lakoff's theories of "experiential" conceptualization also suggest that our most basic concepts—up and down, inside and outside, movement toward a goal—are based on our experiences of living in our bodies, while Jean Mandler suggests a slightly different list of these schemas, including animacy, causality, agency, containment, and support. Gerald Edelman's theory of "neuronal group selection" attempts to provide a neuroscientific model for the kind of "semantic bootstrapping" de-

scribed by Lakoff, in which our embodied brains create meaning out of experience of an environment.[27]

More complicated linguistic structures and rational concepts are similarly built up on these basic spatial schemas. Mandler provides as an example the basic image schemas of "containment" and "support," which, she argues, allow the early acquisition of the prepositions *in* and *on* in English-speaking infants.[28] According to Lakoff, all thought is fundamentally "imaginative, in that those concepts which are not directly grounded in experience employ metaphor, metonymy, and mental imagery—all of which go beyond the literal mirroring, or *representation*, of external reality."[29] According to such a model, metaphor becomes not an aberration from or exception to primarily logical processes of meaning but a basic component of thought and language. As Mark Turner has suggested, "Processes such as metaphor and metonymy, which most linguists deport to the alien realm of literature, are implicit and indispensable in ordinary language."[30] Similarly Antonio Damasio has offered an account of the embodied brain that stresses the implication of feelings in the most seemingly rational processes of thought.[31] Cognitive science thus provides increasingly convincing evidence that the body does shape thought and language, that the early experiences of living in the body are the armature on which consciousness and thought are formed.

The barrier to considering the brain of an author such as Shakespeare as one material source (among many) for his texts is, of course, that a long-dead author is not available to us in any living, material form. Any attempt to take into account even a living author must usually slide into talk about the immaterial "concepts" or "intentions" behind the material text that we possess. In *The Material Word: Some Theories of Language and Its Limits* the Marxist linguists David Silverman and Brian Torode clearly articulate this problem. Silverman and Torode argue against the Saussurean position that "linguistic communication consists in the transmission of immaterial ideas or concepts from one person (speaker or writer) to another (hearer [*sic*] or listener) by means of material signs such as marks on paper or vibrations of air waves." They find Saussure's belief in an extratextual "reality . . . which, he supposes, is somehow held in the brain of the communicating person," to be the source of the problem since "the brain is unavailable to the researcher. Its content, conceptual or otherwise, remains mysterious, and can only be the subject of speculation or arbitrary assumption," a "speculative mysticism" and, even worse, "*idealism*" in treating "the material sign as the mere appearance of an underlying ideal reality."[32] This "speculative mysticism" or mystification is the source of Stallybrass and de Grazia's "ghostly" genius and Greenblatt's invisible hand.

But Silverman and Torode's assumption that "the brain is unavailable to the researcher" is not quite true, although literary and cultural critics almost universally proceed as if it were. Cognitive sciences—including cognitive psychology, neuroscience, linguistics, anthropology, and studies in artificial intelligence—continue to open windows into the workings of the brain and to explore the relationship between the material brain and our immaterial concepts of mind.[33] Of course cognitive researchers are unable to understand completely even the simplest brain functions and so may seem very far indeed from explaining the processes that produced some of the most complex texts ever written. However, using computer models, studies of aphasia and other instances of brain damage, studies of language acquisition, linguistic errors, and categorization across cultures, as well as magnetic resonance imaging (MRI) and positron-emission tomography (PET) to reveal areas of activity as the brain carries out specific functions, these theorists are now beginning to chart the ways in which, to cite Stephen Kosslyn and Oliver Koenig, "the mind is what the brain does."[34]

Using this research to retheorize authorship does involve a potentially essentialist assumption that most human brains share biological and chemical components, but as we shall see, this assumption does not prevent a consideration of the ways in which material culture interacts with, shapes, and is shaped by those physical attributes. Indeed, cognitive science offers the more radical idea that social and cultural interactions have materially altered the physical shape of the brain.[35] Nor does use of concepts from bodies of knowledge commonly called "sciences" prevent us from acknowledging the role of culture in shaping their assumptions and investigations. Although I want to avoid a scientific positivism that would consider scientific insights as objective knowledge superior to the tenets of literary and cultural criticism, I do believe that theory can be derived from scientific knowledge and considered to have truth value equivalent to that of other current bodies of theoretical speculation.[36] I would only ask that we apply to cognitive theory the same tests we apply to other kinds of theory, that is, simply to consider whether it convinces or intrigues or interests us, and whether it provides us with a useful model for interpreting texts and cultures.

Cognitive scientists do not present a uniform version of the nature of "concepts" in the mind and their relation to language; however, as we have seen, they do complicate Silverman and Torode's assumption that such concepts are necessarily and completely unavailable to us. Cognitive science at present comprises, roughly speaking, two broad approaches: the approach that holds that the brain works according to logical rules in ways that are analogous to digital computers and the one that argues that mental functions are shaped by their evolution within a human body and

are not essentially in accordance with formal logic or analogous to computer programs.[37] These two approaches are not mutually exclusive in every detail, and although I use material from both, I have found the second, with its focus on semantics and the cognitive bases of meaning, to be more useful for the interpretation of literary and cultural texts.[38]

Research on visual perception, memory, and category formation all suggest that concepts exist in the mind as visual models and also as discursive propositions, both developed from the preconceptual schemas described above.[39] Cognitive scientists have suggested a number of ways in which structures of language probably reflect cognitive processes. From a cognitive perspective, the relationship between concept and language is significantly different from the paradigm suggested by the Saussurean semiotics on which postmodern literary and cultural critics tend to rely.[40] John R. Taylor uses cognitive research in color terms to sketch out the differences between semiotic and cognitive theories of language. Saussure's most influential arguments posited (1) that linguistic signs are arbitrary with respect to the connections between phonetic form and meaning and between meaning and the world. The phonetic form *red* has no necessary connection with the meaning "red," nor does it have any necessary connection to any phenomenon actually existing in the world. In Taylor's words, Saussure argued that "reality is a diffuse continuum and our categorization of it is merely an artifact of culture and language."[41] Saussure also held (2) that language is a "self-contained, autonomous system": "concepts, i.e. the values associated with linguistic signs, are purely differential"; that is, they arise purely from difference from other terms in the system and not with reference to any extrasystemic reality.[42] Silverman and Torode are not alone in accepting these Saussurean concepts as the basis of their theory of language and culture. As Hart has noted, Derrida's *Of Grammatology* deconstructs Saussure's distinction between speech and writing but accepts the basic concepts of arbitrariness, self-contained systemicity, and meaning produced by difference.[43] Lacan, of course, similarly relies on Saussure for his account of the role of signification in the formation of the unconscious, as does Foucault for his argument that subjects are embedded within powerful discursive systems. In general, postmodern concepts of both the fragmented subject and its construction by an ideologically charged symbolic order can be traced to Saussure.

On the other hand, cognitive theory, in Taylor's words, "strongly emphasizes the non-arbitrary, motivated nature of language structure."[44] From a cognitive perspective, language is shaped, or "motivated," by its origins in the neural systems of a human body as they interact with other human bodies and an environment. This theoretical position has profound implications for postmodern concepts of subjectivity and cultural construction. In the first place, although the relationship between a partic-

ular phoneme *tree* and the concept that it represents is arbitrary, the meaning of the concept itself is grounded in the cognition and experience of human speakers and is structured by them. Cognitive subjects are not simply determined by the symbolic order in which they exist; instead, they shape (and are also shaped by) meanings that are determined by an interaction of the physical world, culture, and human cognitive systems. In Terence Deacon's formulation, the human brain and symbolic and linguistic systems have coevolved, and each has exercised a formative influence on the other.

Research in cross-cultural use of color terms can convey the differences between semiotic and cognitive theory more clearly. A semiotic paradigm assumes that colors "exist" in the real world as an undifferentiated spectrum; thus, distinctions among different "colors" are completely arbitrary, a product of cultural convention. According to a semiotic model, all color terms in a system would have equal value because their meanings are determined by their differences from one another; red is red because it is not blue or green. Similarly, each "red" would be equal in status to every other "red." The work of Brent Berlin and Paul Kay, however, suggests that those terms work differently. They found that although speakers of different languages tend to locate the barriers between color terms (e.g., between the terms for blue and green) quite differently, they nevertheless tend to identify the same shades of blue and green as "focal," or exemplary, colors.[45] As Taylor explains, "Although the range of colours that are designated by *red* (or its equivalent in other languages) might vary from person to person, there is a remarkable unanimity on what constitutes a good red."[46] Berlin and Kay also found that the color terms available in widely different languages tend to "progress" in a predictable way. If a language only has two color terms, they will designate focal black and white. If there is a third term, it will always designate red, and a fourth term will designate yellow or green, followed by blue, then brown, then gray, orange, pink, and purple in no particular order.

These findings correspond to research on human perception of color, which suggests that focal colors comprise wavelengths of light that affect the cone cells in the retina most strongly.[47] Color is created, in Terence Deacon's words, "by the brain as a means of maximizing distinctive experiences of photons striking the cones of the retina in blended streams of different wavelengths." Through a process called "opponent processing," the brain opposes signals from three different types of cone cell to obtain a "difference signal." Deacon argues that this process of "opponent processing" yields the structure of "color complementarity"—that is, that colors exist in relation to one another on a color wheel, green opposite red and blue opposite yellow. Deacon further argues that this complementary structuring of the spectrum causes perceptual biases that, over time, cause

color names in all languages to evolve in similar ways.[48] Colors may exist in nature as an undifferentiated spectrum, then, but the human perceptual system divides them in predictable ways. The meaning of *red* is thus produced by an interaction of wavelengths of light, the human retina, a human cognitive system that can extend the concept of red to other, similar but not identical colors, cultural conditions (e.g., the range of colors available in a desert environment as opposed to those available in a rainforest), and a system of signs that arbitrarily links the phoneme *red* with a particular set of sensory and cognitive phenomena. Meaning in this sense is not entirely arbitrary, nor is it wholly produced by differences within an independent and self-contained system of signs.

Color research (as well as other work on categorization) suggests that mental models of many concepts are probably stored in human memory systems in radial categories that yield "prototype effects": when asked to make judgments about membership in a category, subjects identify certain members of the category as more typical examples of it than other members.[49] As Taylor has suggested, prototype effects shatter the Saussurean assumption that all members of a category have the same status and also the classical logical assumption that categories have firm boundaries and that membership in a category is defined by a set of common features.[50] Instead, a semantics based on the concept of prototypicality and related phenomena such as "domains," "frames," "scripts," and "mental spaces" posits meanings that have fuzzy boundaries and emerge from complex sensory and cultural experience, structured by cognitive conceptual categories.[51] Instances of multiple meaning such as polysemy, metaphor, and metonymy are, according to such an approach, not exceptions to regular rules of meaning but are instead manifestations of the ways in which structures of meaning normally work.[52] Cognitive linguists have traced a number of ways in which word meanings are based on complex domains of cultural knowledge and are extended beyond their original reference through metaphor and metonymy to form "chains" of linked meanings.[53] They have also shown how features of grammar are "motivated" by cognitive structures, for example, how tense sequence in English conditionals can be related to the structure of mental spaces that lie behind the semantic content of the sentence.[54] Like postmodern theory, these cognitive approaches recognize that human cognition and the symbolic systems through which it works are neither unified nor primarily rational. For cognitive theory, however, the preeminence of fuzzy categories in human mental functioning does not imply complete lack of agency or a triumph of irrationality. If you do not expect human cognition to be unified or logical, a way is cleared to supplement deconstruction (which essentially rediscovers its fragmentation and irrationality over and over again) with analysis of the patterns that do emerge from cognitive processes.

These cognitive theories of meaning may, in fact, accord with early modern linguistic understanding and practice more closely than does a Saussurean model, much as the cognitive concept of an embodied mind seems closer to early modern humoral physiology than the radically dualistic post-Cartesian paradigm. Ellen Spolsky suggests that early modern paintings and texts often engage the relationship between mind and body in explicitly self-conscious ways.[55] Judith Anderson has argued that early modern theories of word meaning were less "lexicalized" or restricted by an official dictionary definition than current theories and that they acknowledged a "fundamental metaphoricity" of language, which Saussurean linguistics would deny.[56] Anderson, indeed, notes the resemblance between Lakoffian theories of metaphoric extension and early modern reliance on etymological links to concrete material roots in defining abstract words.[57]

We might even revisit Foucault's influential argument in *The Order of Things* that the early modern period experienced a shift from categorization based on analogy to a more "rational" system based on difference. Foucault emphasized that this change involved "the substitution of analysis for the hierarchy of analogies," an analysis that is now able to yield (in theory) a kind of certainty and closure that was not possible before: "Complete enumeration, and the possibility of assigning at each point the necessary connection with the next, permit an absolutely certain knowledge of identities and differences."[58] Foucault is, of course, concerned to question this certainty and to suggest the ways in which the new "rational" modes of analysis are themselves the products of (and necessarily biased by) discourse. However, his critique of rationalist analysis is contaminated by his own assumption of a Saussurean theory of meaning based on difference.[59] In different ways, cognitive science has also come to question this classical rationalism and to replace it once again with a theory of meaning that is based on analogy, metaphor, and interrelationships between the mind and the world.[60] Whereas Foucault was concerned to provide a critique of assumptions about the inevitability and truth of rationalism, cognitive theory moves forward, in a sense, to explore the implications and possibilities of its a-rationality but also helps us look backward toward systems of thought that preceded the ascendancy of reason.

Portraits of Shakespeare emphasize the large dome of his forehead, accentuated by a receding hairline; he must have had a brain. And if he did, and if sixteenth-century brains functioned even approximately as modern ones do, it must have comprised occipital, temporal, parietal, and frontal lobes, as well as the gyri and sulci (bulges and creases) that neuroscientists have identified as important landmarks within the brain.[61] And if Shake-

speare's brain functioned as most normal brains do today, then the formation of a sentence—"Whether 'tis nobler in the mind to suffer / The slings and arrows of outrageous fortune. / Or to take arms against a sea of troubles, / And by opposing, end them," for example—probably involved activity first in the occipital, posterior superior parietal, and posterior inferior temporal lobes, central to the generation of mental images, and then in the perisylvian cortex (those regions of the brain located near the sylvian fissure, also called the lateral sulcus), where the images (slings and arrows, arms, sea) and concepts (grounded, perhaps, in a Lakoffian metaphoric structure, "life is a war") would be associated with appropriate words and formed into a grammatically acceptable sentence.[62] The construction of the sentence would probably have involved the formation and linking of several "mental spaces," or temporary areas of knowledge, in this case, perhaps, metaphorical spaces (sea, arrows) that could be mapped onto a more abstract conceptual space (life is difficult; should I commit suicide?).[63] Within those regions of his brain, complex neural networks working simultaneously (and for the most part without conscious awareness or direction) would first generate the image and then search Shakespeare's associative memory for the appropriate lexical, cultural, syntactic, and grammatical information needed to form a meaningful sentence, and, once it was formed, send to his hand the neural messages necessary to record it on paper. The choice of individual words (my main concern in this book) would be shaped and constrained by stored prototypes (based on cultural knowledge), by the coordinate and collocational links within stored semantic fields, and by innate structures of syntax, sound, and lemmatization.[64] Within Shakespeare's brain, culture and biology met to form him as a subject and to produce his texts. Within the matrix of cultural prototype and biological structure, "Shakespeare" would nevertheless have experienced some sense of choosing from among various workable semantic and syntactic possibilities.

It is worth briefly considering why the insights of cognitive neuroscience and psychology have been so neglected by literary and cultural critics, who continue to rely on Freudian (or Lacanian), Derridean, Foucauldian, and Althusserian theoretical models for constructing their views of authorship and its relation to culture. One reason may be that these theorists and the critics who use them literally speak the same text-centered interpretive "natural" languages. Traditional theoretical models seem more relevant to studies of texts because they are themselves text-based. Unlike cognitive sciences, which take the brain as their focus of study and which often use formal languages (such as mathematics or computer "languages") to *describe* them, the text-based theorists listed above study the literary and cultural productions of the mind and use recognizably literary discourses to *interpret* them.[65] Because cognitive sciences are pri-

marily descriptive of physical states and processes rather than interpretive of the verbal and textual products of those processes, they seem less obviously useful as interpretive tools.

Another reason for our neglect of cognitive sciences may lie in their relatively primitive state and in the passionate disputes and disagreements that make their findings so controversial. Since cognitive scientists do not agree on such seemingly basic concepts as the nature of intelligence, the relative roles of innate capacity and cultural forces in developing cognitive abilities, and how the brain processes information, it might seem impossible to derive even a stable *theory* of mind from their morass of conflicting assertions. Nevertheless, I believe that cognitive theory may provide some help in getting around the current critical impasse between those who assume an author with conscious control over the text he produces and those who assume that cultural construction leaves little or no room for authorial agency. While it is true that many areas of cognitive science share a similar split between innatist and cultural constructivist views of cognition, the cognitive sciences do seem to offer more theoretical orientations that assume some combination of the two. Cognitive theory also treats consciousness, intentionality, agency, and meaning in ways that both resemble and differ markedly from most postmodern literary and cultural criticisms, so it offers the possibility of seeing our own most basic assumptions from a different perspective. The current theories of cognitive psychology seem to some extent to corroborate our view of the author as fragmented, unable consciously to control language, unable to evade the mandates of his culture. But they also open a space for a more informed speculation about the role of the author within culture and the role of culture within the author's brain.

I want to begin by summarizing some of the suggestions about selfhood, consciousness, and especially language processing offered by researchers in cognitive neuroscience and psychology. Although to attempt such a summary at this point, when cognitive theorizing about these issues is provisional at best and when any such account must necessarily oversimplify complex issues, may seem foolish, I believe that it is important to provide a larger theoretical context, however tentative and piecemeal, for the linguistic concepts that are central to this book. Here again, on most of these issues it is possible to discern a split between cognitive scientists who view the brain as essentially computerlike—logical, mechanistic, processing (not creating) objective reality—and those who stress that brain function is biological, embodied, and not essentially logical.

In a sense the mind-body problem is easily resolved, as the philosopher John Searle has suggested.[66] The passage cited above from Kosslyn and Koenig, "the mind is what the brain does," sums up the dominant cognitive position. In this respect, as I have suggested, contemporary cognitive

theory resembles the pre-Cartesian, Galenic materialism that shaped early modern concepts of body and mind.[67] Cognitive scientists are a long way from understanding how the brain produces the mind, however. Although computer programs and psychological testing are useful in providing models of behavior that can reveal how the mind is embodied, links between behavior and physiology are still fairly crude.

The cognitive emphasis on the embodiment of thought offers the possibility of a more radical materialism than does current Marxist theory, since it attempts to explore the literally material origins of the self.[68] Cognitive theorists do recognize the problematic nature of our perceptions of "reality," acknowledging that what seems to be our direct perception of reality is in fact "illusory: what we perceive depends on both what is in the world and what is in our heads—on what evolution has 'wired' into our nervous systems and what we know as a result of experience."[69] Nevertheless, cognitivist mental concepts seem to be "material" in three ways; (1) they emerge from and consist in the neural matter of the brain; (2) they are shaped by perceptions of physical "reality" and by the experience of living in the body; and (3) they use metaphor to extend concepts derived from material experience to immaterial abstractions.[70] F. Elizabeth Hart has suggested that a cognitive "materialist linguistics" similar to that outlined here establishes a "systematic continuity among three elements: the . . . human mind; the semiotic sign through which that mind finds expression; and the culture from/into which the mind absorbs/produces convention."[71] Mental representation, then, involves the material brain, its perceptions of material culture (from its embodied perspective), and its internal models of those perceptions. A cognitive materialism would differ sharply from Marxist theory in assuming that the subject participates in the creation of meaning as it interacts with material culture since, as Michel Pecheux describes it, the Marxist position assumes "the independence of the external world . . . with respect to the subject, *while at the same time positing* the dependence of the subject with respect to this external world."[72] In this sense it might respond to Paul Smith's call for an amendment of Marxist theory "in order to clarify the human person who is constructed at different moments as the place where agency and structure are fused."[73]

Cognitive science also offers theories of consciousness that both resemble and differ from currently dominant paradigms. Many researchers in both computer and neuroscience fields seem to agree that most mental functions are unconscious. Although literary critics are usually willing to posit a Freudian or Lacanian unconscious consisting of drives and desires that have been repressed, cognitive functions are generally treated as if they were largely conscious. However, since the brain has billions of neurons working simultaneously to perform different functions instantane-

ously, it is only possible for us to be conscious of a tiny fragment of these processes after they have occurred.[74] As Antonio Damasio puts it, "The present is never here. We are hopelessly late for consciousness."[75]

Wilma Bucci's recent book *Psychoanalysis and Cognitive Science* begins with the assumption, widely shared among experimental and cognitive psychologists, that the psychoanalytic "metapsychology," the theory of how the mind works, has "failed to provide a viable foundation for further theory development; a new explanatory theory is needed as a basis for clinical work and research. The physical sciences have moved far beyond the turn-of-the-century principles on which Freud's energy model was based."[76] Bucci also believes that psychoanalysis itself remains a valid method of treatment, and she offers a synthesis of current cognitive theories of the mind in order to form a basis for analysis as a clinical practice. She suggests that a concept of "the human organism as a multicode emotional information processor, with substantial but limited integration of systems," can "provide a framework for developing consistent definitions of the basic concepts and processes of psychoanalysis" (74). Bucci argues that the most important systems are the three "coding formats" of the mind: the subsymbolic, the nonverbal symbolic code, and the verbal code.[77] In Bucci's view, the attribution of consciousness is less important since all three of these coding formats have conscious and unconscious components (177–78).

From a cognitive perspective, therefore, most mental functioning is unconscious, and the unconscious mind is largely unconscious not because of repression but because mental processes are simply too complex and swift to be registered. This is not to say that the mind has no Freudian unconscious; evidence of dreams, the uncanny, and other manifestations of condensation and displacement is certainly persuasive. As Bucci notes, "The type of symbolic imagery that has been identified as having psychoanalytic meaning constitutes a subset or special case" (175) of the larger, mostly unconscious image system of the brain. The Lacanian unconscious, with its linguistic structuration, seems to some extent to include both cognitive and Freudian versions: "The presence of the unconscious in the psychological order, in other words in the relation-functions of the individual, should, however, be more precisely defined: it is not coextensive with that order, for we know that if unconscious motivation is manifest in conscious psychical effects, as well as in unconscious ones, conversely it is only elementary to recall to mind that a large number of psychical effects that are quite legitimately designated as unconscious, are nonetheless without any relation whatever to the unconscious in the Freudian sense."[78] The existence of a cognitive unconscious as well as a psychological unconscious suggests that buried links among words, for example, may represent cognitive structuration as well as (or instead of)

psychological phenomena and that they might be interpreted differently as a result.[79] This broader view of unconscious mental process also means that speaking about Shakespeare's brain as one place of origin for his works does not imply complete conscious control over them. It might again be possible to write about Shakespeare as an agent, conceiving of that agency as partly conscious and partly unconscious, with an unconscious component that reflects cognitive as well as affective categories.

Cognitivism also offers views of human agency and the human subject that seem both familiar and radically different.[80] The very definitions of such terms as *subject*, *agent*, and *discourse* can be conceived differently from a cognitive perspective. For instance, while a Marxist or psychoanalytic theorist typically distinguishes *individual* ("the illusion of whole and coherent personal organization") from *subject* ("the term inaccurately used to describe what is actually the series or the conglomeration of positions, subject-positions, provisional and not necessarily indefeasible, into which a person is called momentarily by the discourses and the world that he/she inhabits"), the cognitive theorists Lakoff and Johnson identify the "system of different metaphorical conceptions of our internal structure," which is based on a distinction between *subject* ("the locus of consciousness, subjective experience, reason, will, and our 'essence' ") and *selves* ("our bodies, our social roles, our histories").[81] Although *subject* seems to mean almost the opposite in these two sets of binaries, representing multiplicity and constructedness as opposed to a unified "individual" in one case and representing that experience of unity and wholeness as opposed to multiple and constructed "selves" in the other, the most crucial difference lies in the Marxist/psychoanalytic attempt to distinguish an illusory experience of wholeness from an "actual" multiplicity of positions and the cognitive assumption that both *subject* and *self* are part of a metaphoric system through which we experience our subjectivity. For a cognitive theorist the question is not which is more accurate as a description of human selfhood but rather how we rely on both metaphors, and the difference between them, for our sense of ourselves as persons.

Agency might also be conceived quite differently in cognitive theory if we accept as a typical postmodern formulation Paul Smith's definition of *agent* as "a form of subjectivity where, by virtue of the contradictions and disturbances in and among subject positions, the possibility (indeed actuality) of resistance to ideological pressure is allowed for (even though that resistance too must be produced in an ideological context)."[82] His focus on resistance to ideology seems overly simple from a cognitive perspective, where agency is a basic and presymbolic image schema. In Mandler's words, "Perceptual analysis of causal and non-causal motion is involved not only in the formation of concepts of animacy and inanimacy but also in the development of the concept of an agent. Animate ob-

jects not only move themselves but cause other things to move; it is the latter characteristic, of course, that turns animates into agents."[83] Although a cognitive theory of agency does not disallow the idea that ideology can constrain subjects from acting as free agents, it does not define human agency solely in relation to ideology. Understanding agency as a constitutive feature of the human experience of embodied selfhood and a basic building block of thought and language extends our sense of its force in both cognitive and cultural spheres.

Although I discuss the definition of *discourse* at length in the final chapter of this book, it is worth noting here its usefulness as a term that calls attention to the role of language in the transmission and replication of culture. Although from a cognitive perspective *discourse* means simply "conversation," I use it here in a roughly Foucauldian sense that has been well articulated by Lars Engle, who describes it as "the collection of preexistent constitutive linguistic social and cultural modes, forms, or codes, themselves evolving and interacting, which surround, condition, and interpret the activity of subjects."[84] Engle's pragmatist approach resembles cognitive theory in several important ways, and I agree with his sense that it is important to rethink subjectivity and agency as "a dynamic process of mutual reflection and challenge between agents and the discursive systems in which they find themselves" (63). However, a cognitive approach differs in avoiding the assumption that discourses "preexist" the subjects that they shape, focusing instead on the very processes through which subjects produce and reproduce discursive forms of all kinds.

As we have seen, then, postmodern theory generally shares two assumptions that seriously impair the possibility of human agency: (1) that the human subject is fragmented and therefore lacking in unitary agency and (2) that subjects are formed by culture (or ideology) acting through language and therefore lack the freedom necessary to choose their actions. These assumptions work most powerfully in Freud's partitioned subject; in Saussure's system of signs, which determines meaning through difference; and, perhaps most influentially, in Lacan's application of Saussurean principles to psychoanalysis and Althusser's Lacanian theory of ideological interpellation.

Cognitive theory shares both of these assumptions to some extent. It recognizes a partitioned subject but finds it to be variously integrated; some cognitive theorists argue that its integration is illusory, while some do not. Although early psychological and computer models of mental process assumed that there was a "homunculus," or single agent in control of the mind (and thus comprising the "self"), more recent work has found such a theory to be unsatisfactory.[85] The computer scientist Marvin Minsky has argued that the brain contains a "society of mind" made up of multiple agents that are not *controlled* by any single entity. Minsky be-

lieves that models of a controlling self are common because "so much of what our minds do is hidden from the parts of us that are involved with verbal consciousness."[86] Cognitive neuroscientists now sketch out complex neural networks that regulate themselves according to identifiable principles but are not controlled by any central entity or mechanism within the brain.[87] Damasio describes a self that, while it does not possess "a single central knower and owner," nevertheless experiences most phenomena from "a consistent perspective, as if there were indeed an owner and knower for most, though not all, contents." Damasio locates this perspective in "a relatively stable, endlessly repeated biological state" based on "the predominantly invariant structure and operation of the organism, and the slowly evolving elements of autobiographical data."[88] George Lakoff has recently surveyed the "system of metaphors" that "allows us to conceptualize the experience of consciousness," concluding that "there is not just one single, monolithic, self-consistent, correct cultural narrative of what a person is"; instead "there are many partially overlapping and partially inconsistent conventional conceptions of the Self in our culture."[89] A completely integrated "individual" self, then, may, strictly speaking, indeed be a myth, as both psychoanalytic and Marxist theory suggest; however, the concepts of a tripartite self (id, ego, superego) or of "subject position" may be themselves too schematic to describe the multiplicity of competing processes going on within a given brain at any moment or to explain the effective integration of those processes.

Cognitive theory similarly recognizes the powerful role of culture in forming the subject but insists that there is an interaction between the biological subject and its culture. Meaning is not just the product of an exterior system of signs but is fundamentally structured by human cognitive processes. Fredric Jameson perhaps most clearly articulates (from a Marxist perspective) the Lacanian and Althusserian assumption that language enters the subject from outside and in the process both alienates and subjects the self. Jameson describes Lacan's theory of the "production of the Unconscious by way of a primary repression which is none other than the acquisition of language." As Jameson characterizes it, "The Law, represented by the parents, and in particular by the father, passes over into the very nature of language itself, which the child receives from outside and which speaks him just as surely as he learns to speak it."[90] Many cognitive linguists (Noam Chomsky, Steven Pinker, Ray Jackendoff) posit innate linguistic capacities, and almost all cognitive scientists see language acquisition as involving both biological and cultural factors. Studies of language acquisition and creolization provide compelling evidence that children are able, to some extent, to "create" as well as "learn" language. If children are exposed to a pidgin language (lacking in such grammatical resources as word order, tense, clear distinctions between subject and ob-

ject), they will independently and without exposure to any other language convert it to a creole form "with standardized word orders and grammatical markers that are lacking in the pidgin" spoken by their parents.[91] If language comes from inside as well as outside the subject, it is unlikely to be as profoundly alienating as Lacan has suggested.

If, as Lakoff, Edelman, and Damasio have argued, thought and language emerge from our perception of a self within a body as it interacts with an environment, then some form of agency is fundamental to language. Indeed, as Mandler, Ronald Langacker, and others suggest, agency is reflected in our grammar at the most basic levels—in the Silverstein hierarchy, for example, which identifies a gradient of "concrete, agentive, egocentric qualities" and can predict such grammatical phenomena as nominative-accusative patterning in split-ergative languages or the use of *of* or *-'s* genitive forms in English.[92] Additionally, Edelman's theory of "value" and Damasio's theory of "somatic markers" suggest that cultural constraints (ideology), acting in concert with biological predispositions and constraints, can shape the subject prior to the acquisition of language. Thus, language itself is not so essentially implicated in ideology or cultural constraint. Certainly the difficulty of talking about anything other than simple intentional agency reflects the strength of the concept. Transcripts of conversations with aphasics suggest that people feel immense frustration if their ability to choose appropriate words is impaired. For example, in answer to an interviewer's question, "What happened to make you lose your speech?" one patient responded, "Head, fall, Jesus Christ, me no good, str, str . . . oh Jesus . . . stroke."[93] This patient evinced anger and frustration at his inability to control his speech, to use language to express his intended meaning. Even if such control is illusory, it is still clearly a powerful expectation. However, if conscious agency (defined as actual control over such mental processes as decision making, language production, etc.) is, finally, a meaningless concept, then issues of whether or not ideology controls subjects within a given culture may be both limited and limiting as constitutive questions for criticism. Instead, we might need to consider ways in which mental processes are both facilitated and constrained by the interaction of biological structures and cultural forces.

The relative roles of innate biological structures and culture in determining human thought and behavior are, of course, vehemently debated within almost every branch of cognitive science.[94] Most people are familiar with the debates about the factors determining human intelligence and, perhaps to a lesser extent, debates about the Chomskian proposition that language is essentially an innate, rather than learned, ability.[95] Most cognitive sciences, however, posit some form of interaction between culture and organism, although they differ, of course, on the relative importance of each factor. Certainly the extreme cultural con-

structivist views of Benjamin Whorf and Edward Sapir, who argued that the cultural constraints of language determined what could be thought or even perceived, have been generally rejected. On the other hand, cognitive linguists such as Lakoff, Langacker, and Taylor argue that the meanings of words are always ultimately based on complex, "encyclopedic" knowledge of the culture in which they are produced.[96] The research on perception of color described earlier, for example, indicates that even if a given culture lacks certain color words, its members are nevertheless able to perceive focal colors that they lack the vocabulary to name, although they are less able to *remember* differences between nameless colors.[97] Such research, as we have seen, also indicates that color terms are acquired by cultures according to an almost universal pattern.

Cognitive science suggests that the power of culture to shape individual selves must be filtered through the material, biological constructs of the brain, which are common, though in different forms, to all (normally functioning) people across cultures. It argues that there is a material basis for a limited sense of "essential" human attributes as well as space for individual arrangements of neurons. The political implications of accepting biological as well as cultural determinants of selfhood are complex and have by no means been worked out fully. Certainly arguments asserting that intelligence, for example, is biologically rather than culturally determined have been associated with racist politics. Steven Pinker, who argues that there is a separate and innate "language instinct," suggests that racist interpretations of biological determinism are based on a false claim that the supposition of innate commonalties among all people also means "that differences between individuals, sexes, and races are innate."[98] Instead, Pinker cites the studies of Walter Bodmer and Luca Cavalli-Sforza suggesting that genetic variations within "racial" groups are much greater than differences between them. Recent studies suggest some ways in which gender affects cognitive functioning, but they also suggest that both structures and constraints common to all brains, regardless of gender, as well as individual differences in neuronal groupings, are more salient in determining the nature of brain function.[99]

As I suggested above, cognitive theory accords with most poststructuralist theory in questioning the very concept of rationalism. Failures in the development of artificial intelligence, on the one hand, and the development of prototype theory, on the other, suggest that older theories of mind placed too much emphasis on rationality. Many cognitive theorists now stress the role of fuzzy boundaries, encyclopedic cultural knowledge, metaphoric extension, and emotion in constituting even the most seemingly rational mental operations. As Gerald Edelman notes, "Whatever the skill employed in thought—that of logic, mathematics, language, spatial or musical symbols—we must not forget that it . . . undergoes flights and perch-

ings, is susceptible to great variations in attention, and in general, is fueled by metaphorical and metonymic processes. It is only when the results of many parallel, fluctuating, temporal processes of perception, concept formation, memory and attentional states are 'stored' in a symbolic object—a sequence of logical propositions, a book, a work of art, a musical work—that we have the *impression* that thought is pure."[100] Damasio similarly charts the large role of emotion in rational decision making.

Derrida's critique of Western rationalism might thus be reconceived in cognitive terms: the metaphors that in a deconstructive reading seem to disrupt the surface logic of the text could also be interpreted as traces of basic cognitive structures.[101] These seemingly contradictory metaphors are present in a text because thought, from a cognitive perspective, is able to accommodate contradiction and recursivity. A Derridean reading focuses on contradiction because it *expects* the mind to work rationally and because it assumes (in order to deconstruct) the rigid binary categories of classical logic. Derridean "play" or difference could be reinterpreted as a trace of the prototype effect and the radial structure of meaning. Meaning does (to use Lacan's term) "slide," but not without moorings since despite its fuzzy and inexact correspondences, it is motivated (and constrained) by physical experience. Of course the Derridean "there is no outside the text," based as it is on Saussurean formalism, clearly does not fit a cognitive theory. Indeed, from a cognitive perspective, meaning is anchored (although ambiguously and insecurely) by a three-way tether: brain, culture, discourse.

In this book I look at a series of plays in which Shakespeare seems, in a sense, to have been doing cognitive research on his own mental lexicon. Critics have long recognized that Shakespeare had an unusually large mental lexicon that was perhaps organized around particularly strong image-based mental models.[102] He was also particularly adept at coining "new" words that came to be accepted as additions to the larger cultural lexicon and was fascinated by the forms of homonymy that yield puns.[103] He seems to have been intrigued by polysemy, more "aware" (consciously or unconsciously) than most people of prototype effects, semantic webs, and meaning chains, and interested in exploring the multiple meanings of single words (famously, *nothing* and *honest*) as well as the nature of cultural metaphors of various kinds (e.g., clothing as representing a person's role in life and the multiple associations of children, both in *Macbeth*).[104] By "exploring" I do not necessarily mean a fully conscious phenomenon but simply that the mental connections and associations of semantic webs and prototypes seem especially evident in Shakespeare's work. It seems possible that the process of creating fictional characters to exist in a three-dimensional stage space brought out the spatial structures of language to

an unusual degree. Perhaps it is enough to say that these effects "emerge" through Shakespeare's almost uniquely rich use of language. Shakespeare (i.e., Shakespeare's language-processing functions) causes us to notice these connections—which in turn reveal information about his culture and also about the organizational tendencies of the brain.

Cognitive theory makes it possible to identify patterns of language use that extend throughout Shakespeare's writing career and that can, I think, help us to arrive at a fuller sense of the complex interactions between author and culture that produced these texts. Many of Shakespeare's plays contain striking repetitions of words and images; these have previously been studied to yield either thematic or psychoanalytic insights.[105] I am interested here in what seems to be a special focus on polysemic words of various kinds, especially those that were taking on new meanings in this period in concert with significant institutional and cultural changes. In a given play or group of plays Shakespeare typically hovers around one of these words (or a group of related words), repeating it, worrying it, using it in all of its different senses, punning on it, in ways that reveal its embeddedness in semantic webs and its implication in ongoing social process. Eve Sweetser has argued that the linked phenomena of polysemy and meaning change are areas of linguistics that particularly challenge the Saussurean assumption of "the arbitrariness of the sign" since "if all uses of signs are taken as arbitrary, then multiple uses of the same sign must also be seen as arbitrary, and so the relationships between them might be assumed to be uninteresting."[106]

Shakespeare's repetition of words undergoing changes in meaning insists on the intermediate stage of polysemy that Sweetser argues must always accompany diachronic change: "If a word once meant A and now means B, we can be fairly certain that speakers did not just wake up and switch meanings on June 14, 1066. Rather, there was a stage when the word meant both A and B" (9). In *As You Like It*, for example, the polysemic words *villain* and *clown* are repeated in ways that reveal (and question) the role of semantic change in the negotiation of changing possibilities for social mobility in the period. It seems almost silly to say that Shakespeare was fascinated by words and the ways his mind associated them and by the ways in which cultural structures could shape and change their meanings (and that words themselves could mediate ideological change), but I think it is important to reassert this assumption. These plays are introspective in the sense that they consist, among other things, in explorations of the cognitive and cultural forces that determine the meanings of words and the shape of subjectivity. They are public introspections written for commercial consumption, but these facts simply ensure that their plays on meaning are constrained by the necessity to make

them readily understandable within the cultural framework of the Elizabethan and Jacobean stage.

In the chapters that follow I focus on a series of such words that, I argue, delineate Shakespeare's changing conception of the material conditions, both cultural and biological, under which subjects were formed through language in early modern England. I focus on *house* and *home* in *The Comedy of Errors*, *villain* and *clown* in *As You Like It*, *suit* in *Twelfth Night*, *act* in *Hamlet*, *pregnant* in *Measure for Measure*, and *pinch* in *The Tempest* because these instances provide particularly rich examples of both cultural and cognitive patterns. Clearly, other words and plays could easily have been chosen. Each of the words that I focus on here is embedded in the discursive formations of larger cultural institutions and also, strikingly, has special reference to material conditions of theatrical composition or production. Shakespeare's mental lexicon shares general structural principles with other human language-processing systems but also exhibits particular patterns shaped by his own personal experiences and history. Thus, each of these words can be associated with basic spatial concepts emerging from the embodiment of cognitive process, but the fact that theatrical domains of meaning have such central roles suggests that Shakespeare's mental lexicon was, understandably, shaped by his professional as well as his personal life.

We can trace a progression in the course of these plays from an interest in the origins of the self within changing versions of both nation and household, to the placement of that self within a shifting grid of status, to the expression of the self between constraint and desire. I believe that we can discern a movement about 1600 from depicting the body as it is contained within a cultural space to representing the ways in which the self inhabits the body; the word *act* in *Hamlet* serves as a kind of fulcrum, shifting from legal to physical connotations. At the same time, Shakespeare's exploration of stage space shifts from experiments in using the stage to represent a cultural environment to suggestions that it functions as a larger reflection of the body, as, for example, in *Hamlet*, when the fortified walls of Elsinore mirror on a larger scale the central image of ears that are fortified against unwelcome or dangerous language. *Measure for Measure* and *The Tempest* evince a new interest in the physical nature of creativity, including an awareness of the brain as a physical organ within the material body just as the body is located within material culture. The physical and mental implications of *pregnancy* and *pinching* are the means through which these issues are explored. At all points, ideas about the self are thought through using theatrical as well as more generally cultural frames of meaning.

This pattern of development may seem implausibly self-serving in that it makes Shakespeare anticipate my own movement from focusing on the

self within culture to the self within its body. I do not mean to suggest that Shakespeare discovered modern neuroscience in the seventeenth century. Certainly his imagined representations of brain function are shaped by the theories of faculty psychology and humoral physiology that were dominant at that time, theories that resemble cognitivism only in their (uneasy) emphasis on the materiality of the mind. Nancy Siraisi has emphasized the extent to which "humoral theory is probably the single most striking example of the habitual preference in ancient, medieval, and Renaissance medicine for materialist explanations of mental and emotional states."[107] Paster notes that our sense of our bodies as "containing" our emotions may stem from humoral physiology; Lakoff, of course, has argued for the universality of this sense based on our kinesthetic experiences of embodiment, and theories of the humors may have been formulated in part to explain the physical sensations that Lakoff describes. However, in most other ways the humoral body (and the mind described by faculty psychology) seems very different from the cognitive brain. Certainly its permeability, the fungibility of its fluids, and the close parallel between thought and sexual reproduction that results from these beliefs differ in varying degrees, as we will see, from the properties of mind posited by cognitive science. Shakespeare, then, certainly experienced his embodied mind in ways that were shaped by his understanding that both body and mind were controlled by the humors. As we look for signs of "cognitive" patterns in the plays, it will be important to keep in mind Shakespeare's culturally determined sense of how the mind was embodied.

A reader might wonder how this "cognitive" approach to the Shakespearean lexicon differs from such previous philological or New Critical studies as C. S. Lewis's *Studies in Words*, William Empson's *The Structure of Complex Words*, Raymond Williams's Marxist *Keywords*, or, more recently, Patricia Parker's *Shakespeare from the Margins*.[108] Although the readings that I produce here may at various points seem very similar to those generated by these other word-based approaches, they are based in a different theory of meaning and emphasize different patterns and structures. Studies of the human mental lexicon have produced a great deal of information about how words are stored in the brain and how their meanings are shaped by basic conceptual structures. Our mental lexicon is evidently organized in ways that facilitate both production and comprehension of language, and Shakespeare's texts seem marked by patterns of word use and syntax that make the organizational features of his mental lexicon especially evident. Studies of word association indicate that, as Jean Aitchison puts it, "word lemmas (meaning and word class) seem to be organized in semantic fields, and within these fields there are strong bonds between coordinates which share the same word class, such as *lion*, *tiger*, or *knife*, *fork*, *spoon*."[109] Tests also reveal strong bonds be-

tween words with collocational links (words usually connected in speech, e.g., *salt water*), superordinates (the word *color* and examples of colors, e.g., *red*), and synonyms. Shakespeare's strikingly frequent use of doublets or lexical sets" such as "complotted and contrived" (*Richard II* 1.1.96), "exsufflicate and blown" (*Othello* 3.3.180), "weary, stale, flat, and unprofitable" (*Hamlet* 1.2.133), and "His companies unlettered, rude, and shallow, / His hours filled up with riots, banquets, sports" (*Henry V* 1.1.55–56), seem to reflect these aspects of lexical storage as well as the Elizabethan practice of copious expression.[110] On the other hand, as Aitchison notes, "word forms (sound structure) . . . are organized with similar sounding words closely linked, such as *referee* for 'refugee,' *reciprocal* for 'rhetorical' " (223).[111] Comic malapropisms such as those made famous by Dogberry, Verges, and Elbow (*odorous* for *odious*, *respected* for *suspected*, etc.) reflect this feature, as, perhaps, does Shakespeare's notorious fondness for puns. These structures of lexical organization are, of course, virtually universal in humans with normal linguistic capacities; however, verbal habits especially associated with Shakespeare's style seem to reflect these structures more directly than do the works of many writers. Shakespeare's tendency to play on and with the mental links between words (which most writers efface) means that his texts are marked by particularly evident traces of cognitive process.

A similar playfulness in Shakespeare's texts also seems to emphasize the complex links that structure the meanings of polysemic words. According to cognitive linguists such as George Lakoff or Ronald Langacker, the meanings of words are determined not by a collection of features or by a system of differences within a semiotic system but by "encyclopedic" cultural knowledge that provides domains, frames, and scripts within which words have meaning.[112] A monosemic word thus comprises a category organized around a single prototype, with knowledge of the prototype based on complex cultural knowledge. The polysemic words that seem to have been particularly interesting to Shakespeare belong to categories of meaning that are structured by several linked prototypes.

Of course, as John Taylor points out, prototype theory suggests that monosemy and polysemy cannot be definitively separated—like all categories, these also have fuzzy boundaries.[113] The words that interest me here illustrate a variety of types of polysemy, ranging from prototype shifts within an essentially monosemic category to polysemy that includes instances of what might be considered homonymy. In *The Comedy of Errors*, for instance, *house* and *home* are essentially monosemous words with basic definitions that remain virtually the same but over time and in relation to cultural change experience shifting prototypes, so that, in Taylor's words, "a non-central member of a monosemous category in-

creases in salience to the point where it constitutes a secondary conceptual centre of the category" (103). In this case, an earlier sense of the prototypical *home* as village shifts to designate either "nationality" or "private domestic space." In concert with these prototype shifts, cognate and related words like *homely* and *housewife* undergo change to true polysemy. In other cases, such as the case of *villain* in *As You Like It*, a word both takes on a new meaning in relation to cultural change and actually works to mediate the change, illustrating an instance in which a polysemic web is implicated in ideology in complex ways. The multiple kinds of suits in *Twelfth Night*, including lawsuits, romantic suits, suits of clothes, and suitable behaviors, illustrate polysemy that verges on homonymy, since some of these senses of the word (*suit* of clothes and law*suit*) have a separate dictionary entry, but according to cognitive theory can be seen to be linked by complex chains and extensions of meaning *that* are structured by spatial concepts of following and pursuit. Each of these instances of multiple and changing meaning illustrates a different kind of interaction between cognitive and cultural structures. In these plays Shakespeare seems to insist on the full range of possible meanings and to explore the ways in which they are linked, thus revealing the underlying semantic paradigms. Again, we need not imagine that Shakespeare does this consciously, but simply that he writes in a way that reveals the underpinnings of the mental lexicon (and thus the conceptual structures of the brain) in various complex ways.

A cognitive approach to Shakespeare's lexicon will therefore differ from previous studies of words on several accounts. I differ from Raymond Williams in focusing on a single author's multiple uses of words that do not necessarily have the status of culturally central "keywords." Like Williams, I am interested in correlating changes in meaning with changes in material culture; however, I am more concerned to identify synchronic polysemous structures that have emerged from historical change. Williams is concerned to see a particular (Marxist) narrative movement of history behind changing keywords, but Shakespeare's plays sometimes problematize the relationship between historical change and the polysemy that it produces. C. S. Lewis, of course, was mainly concerned to warn readers away from anachronistic misinterpretations; he argued (against Empsonian ambiguity) that "in ordinary language the sense of a word is governed by the context and this sense normally excludes all others from the mind."[114] The purpose of *Studies in Words* is to aid the reader in weeding out irrelevant meanings, whereas I accord with cognitive theorists who suggest that any given "sense" of a word is motivated by its place within a radial category of related meanings, which, because of this connection, are never, finally and absolutely, irrelevant.

William Empson's ideas about polysemy are closer to those suggested by cognitive theory and for that reason deserve more lengthy treatment. Empson was largely concerned in his study to refute assertions by linguists that poetic language was purely emotive and to demonstrate the complex cognitive content of poetic language by tracing the fine distinctions elicited by its polysemy. A cognitive approach, on the other hand, might follow Damasio in insisting that cognitive and emotional content cannot be separated. Empson argues that complex words have a "head sense" or "typical" meaning that in some ways seems similar to a prototype effect. Empson's "head sense," however, seems to have very firm boundaries, unlike the fuzzy distinctions recognized by cognitive theorists today. He is concerned to identify "equations" of meaning whereby the complex attitudes and implications conveyed by words could be brought under control and correctly interpreted. Meanings for Empson are complex and multiple, but the intelligent reader is able to sort them out.

Empson's treatment of the development of the word *fool* in the sixteenth century and Shakespeare's use of the word in *King Lear* reveals some of the assumptions behind his treatment of meaning and also suggests some of its shortcomings. He seems to argue that "complex words" are the medium through which authors lead readers to make fine moral and ethical distinctions; words posit complex "equations" of meaning that the reader must solve. Before Shakespeare could use the word *fool* in *King Lear* to convey the folly of incomplete renunciation, it first needed to accumulate several "Implications" and "Emotions" (ranging from Erasmian innocence to imbecility, to madness, to witty mockery, to affectionate regard for a dependent). Empson comments that *fool* became an affectionate term in 1530 and came to mean "pure imbecile" in 1540; "now the introduction of these two further meanings into the word was necessary to complete it as an instrument; given these extra two, the whole group of ideas could be imposed on the hearer by mere word play; to a far greater extent than at any other time, the very subtle thought of *Lear* was inherent in the language."[115] A reader's appreciation of this subtlety is based on an awareness of the full range of relevant meanings as well as an ability to exclude irrelevant implications or emotions. After considering the "shocking" and "embarrassing" racist implications taken on by the word *native*, for example, Empson concludes that "the ordinary user . . . had not intended" for the word to take on such an embarrassing implication. Empson argues that *native* marks an exception: "As a rule, in a successful literary use [of a complex word], the equation does just what the writer and his audience wanted; and this is even more true of the equations carrying the stock ideas of a period, where as a rule there is no tension between individuals or groups" (79). Empson views words as "instruments" that an author can use to convey subtle and complex ideas.

In his history of the changing implications of the word *fool* from the Erasmian "innocent simpleton" to Shakespeare's nexus of clown, imbecile, lunatic, and affectionate dependent, Empson overlooks many of the ways in which social institutions (medicine, law) and the material conditions of theater influence the concept of fool. Although he briefly glances at the legal procedure for assuming the wardship of "idiots and fools natural" (115), he does not consider the socially charged implications of *clown*, which in precisely this period took over from the shifting word *villain* the expression of a special connection between rusticity, low social status, and boorish behavior (see chapter 2 below). This is the kind of "embarrassing" implication that Empson associates with *native* and views as an exception. But the repeated inflections of *fool*, *clown*, and *villain* in *As You Like It* reveal that, unlike Empson, Shakespeare did not underestimate the cultural work done by words. Empson also neglects the material conditions of theatrical production and thus misses the most likely reason why *fool* came to be used more frequently than *clown* as Shakespeare's term for a comic performer after about 1600; in that year the notorious clown Will Kemp left the Chamberlain's Men and was replaced by the more refined "fool" Robert Armin (see also below).

It probably is not surprising that a New Critic such as Empson neglects cultural forces in order to focus on the importance of a close reading of words that convey finely controlled ethical distinctions. New Historicism and other forms of materialist criticism have already attacked and sought to correct this failing of formalism. But cognitive theory offers more than a materialist or historicist supplement to formalism, providing in addition a way of tracing in the text the interactions between culture, language, and cognition. The focus of a cognitivist approach to Shakespeare's use of repeated words includes the ways in which those words reflect the patterns of association and rules of combination within the mind as well as within the culture. In a cognitive approach, words are not strictly separated from images but will sometimes create their meanings in combination with models and images (or as a reflection of an unarticulated model).

In a cognitive approach to Shakespeare's plays the point is not to cause readers to make fine distinctions but to explore linkages and connections between words and, thus, between cultural concepts and between brain, language, and environment. Sometimes Shakespeare seems to push against the socially constructed meanings of words and to explore the extent to which an individual can bend their cultural mandate. In other cases the linkages and connections seem to be less consciously explored and to represent the lineations and filiations of the mind at work. Empson is disturbed by "doctrines" covertly conveyed by words and has as his goal to teach readers to recognize and disarm them. Shakespeare seems to have been interested in the many kinds of work that words and images could

do. On a verbal level, the plays trace in and through language the complex and reciprocal processes by which culture and body form the self.

In its insistence on attention to the complex networks of words that link text and culture, this study perhaps most closely resembles Patricia Parker's *Shakespeare from the Margins*. Parker's readings of rich and historically dense polysemic structures are similar in many ways to the kinds of readings that I offer here. Taking issue with early New Historicist assumptions about the ideologically constrained nature of all discourse, Parker identifies her critical stance in this way: "The methodological presupposition in the chapters that follow is that Shakespearean wordplay—far from the inconsequentiality to which it has been reduced not only by the influence of neoclassicism but by continuing critical assumptions about the transparency (or unimportance) of the language of the plays—involves a network whose linkages expose (even as the plays themselves may appear simply to iterate or rehearse) the orthodoxies and ideologies of the texts they evoke."[116] Parker does not, however, offer a theoretical account (in either early modern or contemporary terms) of why wordplay might sometimes work to expose ideological formations in this way. Cognitive theory can, however, offer a clearer account of what these "linkages" are and why puns and other kinds of wordplay can sometimes seem to have a subversive effect. Although I agree with Parker that Shakespeare's play on polysemic words can "expose" something crucial about the workings of language, I argue that it exposes not just the hegemonic discursive formations of his culture but also the patterns that emerge as the human brain thinks through those formations. I want to be more precise about the agency *behind* this exposure—I think it emerges as language reflects the clash of physiological and cultural constraints—and also *indicated by* this exposure—I think it suggests that some common conceptions of human agency are problematized by the structures of cognition as they are reflected in language.

From a cognitive perspective, the "linkages" that Parker traces reflect the outlines of the mental lexicon, which is organized around linked modules, some, as Jean Aitchison has argued, containing "semantic-syntactic" or meaning-related information, some storing "phonetic phonological" or sound-based information: "Each module is to be a complex network, with relatively tight links to other items within the module and somewhat looser links to items outside of the module. Within each module there should be clusters of dense, multiplex mini-networks."[117] As the brain attempts to retrieve and understand or produce a stored word, "numerous links must be activated simultaneously" involving "links for many more words than will eventually be required" (230). Wordplay, for example, play on the literal (spatial) sense of *preposterous*, which Parker argues exposes the constructedness of Tudor and Stuart discourses of hierarchy,

might have this effect because the network of linkages attaching that word to related words would not comprise a neatly ordered lineal succession of meanings but complex and multiple links involving a surplus of meaning, "links for many more words than eventually will be required." Parker notes both semantic links, such as concepts of right order in class and gender hierarchies and ideas of "sequence, succession, sequitur" (28), and sound links to *posterior* and thence to *ass* and the *arsie-versy.* It is in this surplus of cognitive linkage that simple, hierarchical relations of meaning become inadequate, at least in the writing of an author who tends to highlight, rather than suppress, such links. Wordplay of this kind is not necessarily subversive, but it can often have subversive effects if it exposes buried links and structures that complicate ideological formations that tend to take simpler and more rational forms.

It is no accident that so many of the linked word networks that Parker traces have a spatial structure: the sense of "back for front" suggested by *preposterous*, the mechanics of rhetorical "joining" and linking, the sense of dislocation and movement implied by *translation*, the ways in which *dilation* forms an interface between inside and outside. As Lakoff and others have argued, the spatial structuration of so many cognitive concepts reflects the shaping influence that the experience of embodiment has on cognition and discourse. The wordplay that Parker traces often involves a kind of spatial dislocation—back before front, inside revealed outside—a sense that her title, with its emphasis on bringing the marginal to the center, also reflects. The fact that play on the spatial patterns that inflect discursive ideological structures such as hierarchy and succession might be subversive may represent a bodily surplus of meaning that cannot be completely contained within the limited spaces of official discursive or generic structures.

Certainly some Lakoffian spatial constructs (e.g., "up is better than down") are easily assimilable to concepts of social hierarchy; however, Shakespearean wordplay, in exploring the spatial structurations of polysemic words, can sometimes also expose the ways in which spatial relationships work to create meaning. The body and the embodied brain structure meaning through complex linkages and networks that have a subterranean multiplicity from which simpler ideological structures emerge. I want, then, to offer cognitive theory as a possible background for Parker's methodological assumptions and to look more directly at Shakespeare's play on words that seem to explore the processes of subject formation involving both the body and culture. I do not believe that Shakespearean wordplay is always subversive; rather, it registers complexities of meaning and ambivalences of feeling that sometimes disrupt simple ideological structures.

An objection to my attempt to read cognitive structures behind the Shakespearean lexicon might center on the fact that these plays were products not of a single author's brain but of a complicated and multiply collaborative process. Certainly the texts of Shakespeare's plays as we have them reflect the collaborative conditions of Elizabethan and Jacobean theater. And contemporary emphasis on the multiplicity of texts and dispersion of authorship in the period provides a salutary corrective to the fetishization of the nonexistent uncontaminated Shakespearean "original." But at the risk of resembling Samuel Johnson in his truculent kicking of the stone, I want to point out that even though the whole text might be the product of a number of hands, every single word of each version of a text was physically put there by one person wielding a pen or a compositor's stick. And if, in the multiple texts of a play attributed to Shakespeare, the same word appears in every instance of a particular line, there is a good chance that there was some sort of material connection between Shakespeare's brain and that word.

Certainly Shakespeare was constrained by the tastes of his audience, the availability of actors and costumes, the shape of the stage, and the social and collaborative nature of language itself. But, however cognizant of the many hands though which most theatrical texts passed on their way to publication, we must also remain aware of the material fact of their authorship by William Shakespeare, a fact that has left several kinds of historical trace: Shakespeare's name among the shareholders of the company, contemporary references to him as an envied or esteemed author, the use of his name as a selling point to attract paying customers to the theater and readers to purchase quarto volumes. Stephen Orgel, while acknowledging the extent to which all theatrical texts from the period exist as the products of collaboration, has suggested that Shakespeare had more control over the process of producing a play text than most playwrights because of his status as a shareholder of the company.[118]

Jeffrey Masten has extended the concept of collaboration to include any use of language: "If we accept that language is a socially-produced (and producing) system, then collaboration is more the condition of discourse than its exception."[119] The cognitive scientist Leslie Brothers has recently argued that "the mind" is not "something packed inside a solitary skull" but "a dynamic entity defined by its transactions with the rest of the world."[120] Cognitive theory, then, suggests that language, and even the mind itself, is produced through the interaction of human brains in social contexts; from this perspective, the most meaningful collaboration would have taken place within Shakespeare's brain.

It is also true, as Masten, Arthur Marotti, Joseph Loewenstein, and others (including myself) have demonstrated, that in the early modern period authorship and intellectual property were conceived quite differ-

ently than they had come to be by the nineteenth century, with less emphasis on the originality and proprietary rights of the author.[121] However, to insist on Shakespeare's material role in the production of these texts is not to deny the different constructions of authorship in the period; instead, it can provide a slightly different perspective from which to examine Shakespeare's representation of both the cognitive and the cultural structures that shaped this act of authorship. Indeed, some of the words examined here (e.g., *clown* and *pregnant*) include concepts of collaboration and authorial agency within their polysemic web and reflect complex and ambivalent feelings about them. If every act of authorship is collaborative, then the patterns of word usage that I examine here point to the heart of this collaborative process.

It may seem as if the point of a cognitive approach is the impossible goal of reading Shakespeare's mind rather than his plays. My purpose is simply to look for traces of a mind at work in the text. But if our purpose must now be to ask, for example, in Jean Howard's words, "how gender, class, race, and social marginality or centrality impinge on the way characters are depicted as bearers of theatrical power," or if it is, in Stephen Greenblatt's words, "the study of the collective making of distinct cultural practices and inquiry into the relations among those practices," then we need to be able to read signs of cognitive, as well as cultural, practice in texts.[122] The word *how* in the first instance and *relations* in the second bring us face to face with the agency of the author, however partial, collaborative, or constructed. In this book I want to show that texts bear evidence of formation by cognitive process as well as ideology. The signs of cognitive and cultural fashioning cannot always be discerned or separated, but I believe that some of Shakespeare's plays offer interesting points of collocation between them. I do not wish to return to the masterful, omniscient, transcendent Shakespeare; but neither can I offer a Shakespeare who was just a conduit or space within which rival cultural structures collided. I argue here that the brain constitutes the material site where biology engages culture to produce the mind and its manifestation, the text; these Shakespearean texts reveal traces of a particularly fertile collaboration between the two.