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From Hot Irons to fMRI Machines: On Truth and Lies in a Non-Cerebral Sense

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Abstract

Following the lead of other brain researchers using fMRI technology to connect human experiences to neurocircuitry, Dr. Frank Kozel et al. argue that the possibility of detecting deception in brain activity could replace previous methods of lie detection. Through asymmetrical comparison, this article compares fMRI technology with a sixteenth-century “lie detector” found in *The Hot Iron*, a short renaissance carnival drama by Hans Sachs. Through a brief history of various theories of acceptable and unacceptable naming—from Plato to Judith Butler—I show that naming objects implies belonging to a specific cultural group and its authority to accuse. This conclusion implies that any study of lie detection, rather than focus on the accused, should focus on the culture of the accuser.

Keywords: Lie Detection, Neuroscience, fMRI, Brain, Renaissance, Drama, Critical Theory, Asymmetrical Comparison, Hans Sachs

Sıcak Demirlerden fMRI Makinelerine: Beyinsel Olmayan Gerçek ve Yalanlar Üzerine

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Özet

İnsani deneyimleri sinirsel dolaşım ile ilişkilendirmek için fMRI teknolojisini kullanan diğer beyin araştırmacıları gibi, Dr. Frank Kozel ve ekibi, aldatmacaları beyin aktivitesinde ortaya çıkartma ihtimalinin şimdiye kadar kullanılagelen yalan tespiti metotlarının yerine geçebileceğini savunuyor. Bu makale, asimetrik bir karşılaştırma yaparak fMRI teknolojisini ve onaltıncı yüzyılda Hans Sachs tarafından yazılmış olan bir Rönesans dönemi karnaval oyunu The Hot Iron'da konu edilen “yalan makinesi”ni yan yana koyuyor. Makalede, Plato’dan Judith Butler’a uzanan uygun ve uygun olmayan isimlendirme teorilerinin kısa tarihinden yola çıkılarak nesneleri isimlendirmenin belirli bir kültürel gruba aidiyeti ve bu grubun itham etme otoritesini ifade ettiği gösteriliyor. Bu sonuca göre, yalan tespiti çalışmaları, itham edilenden ziyade, itham edenin kültürüne odaklanmalı.

Anahtar kelimeler: Yalan Tespiti, Sinirbilimi, fMRI, Beyin, Rönesans, Tiyatro, Eleştirel Teori, Asimetrik Karşılaştırma, Hans Sachs

Results show that functional MRI is a reasonable tool with which to study deception.

—Frank Kozel et al., *A Replication Study of the Neural Correlates of Deception*, 2004

Companion to Husband

The iron takes away hair and skin.

Years ago, I was not chaste.¹

—Hans Sachs, *The Hot Iron*, 1551

Introduction

Following the lead of other brain researchers using fMRI technology to connect human experiences to neurocircuitry, Dr. Frank Kozel et al. argue that the possibility of detecting deception in brain activity could replace previous methods of lie detection.² The argument, abbreviated here, proposes that fMRI imaging techniques—which measures changes in blood oxygenation levels in the brain (BOLD)—can detect differences in regional brain activity during periods of telling the truth and periods of what they call “intentionally misleading another.”³ Many subsequent fMRI studies on lie detection followed this study,⁴ though I’ll focus on Kozel et al.’s definition and detection of deception. Per their findings, deception is a threefold process: 1) knowledge of the truth (what actually occurred), 2) inhibition of that truth (knowing the truth yet repressing it), and 3) stating a false response. As the opening quote shows, Kozel et al. claim (BOLD) fMRI methods—compared to previous attempts to detect deception using the polygraph that only measures peripheral arousal — are a reasonable tool to detect deception.⁵ The researchers’ argument is based on criticism of the polygraph, which only measures skin surface temperature, moisture, and heart rate.⁶ In contrast, Kozel et al. argue that their method

¹ Translations of German works, unless otherwise noted, are my own.

² Frank Kozel, Tamara Pagett, and Mark George, “A Replication Study of the Neural Correlates of Deception,” *Behavioral Neuroscience* 118, no. 4 (2004): 852.

³ Kozel, Pagett, and George, “A Replication Study,” 852.

⁴ Jiang, W., J. H. Liu, P. Liao, X. Ma, Y. Rong, W. Tang, and W. Wang, “A Functional MRI Study of Deception Among Offenders with Antisocial Personality Disorders,” *Neuroscience*, 244 no. 6 (August 2013): 90-98; Ewout H. Meijer, and Bruno Verschuere, “Deception detection based on neuroimaging: Better than the polygraph?” *Journal of Forensic Radiology and Imaging*, 8 (March 2017): 17-21.

⁵ Kozel, Pagett, and George, “A Replication Study,” 852.

⁶ David Lykken, *A Tremor in the Blood: Uses and Abuses of the Lie Detector* (New York: Plenum, 1998), 12.

measures blood oxygen level changes in the brain, or what they call “deception itself.”⁷

As fascinating and socially beneficial the ability to detect deception in the brain may be, I propose that this definition of truth and deception may oversimplify the process of recognizing the actuality of events (the narrative of what actually occurred), repressing that narrative, and finally substituting a false response (deception). Though I will not offer a history of all types of lie detection in recorded human history, the introduction of mechanized detection devices in the nineteenth century led to what Melissa Littlefield called a specific definition of lies as “measurable phenomena that manifest themselves in the body’s physiology.”⁸ Following Latour, Daston, and Galison, Littlefield shows how fMRI technology fits in the myth of the “modern world,” where technology can allow nature to speak the truth and previous, non-scientific attempts to determine truth from lies lacked “objectivity.”⁹

In this scientific world, which prioritizes objectivity through neutral mechanical and technological means of measurement, truth and lies appear as the language of the body. As we will see, this methodology is based on many assumptions, one of which is the need for accusation: the body is accused, and through interrogation under certain conditions, truth and deception appear as predictable results. In this article, I will provide an alternative model for recognizing truth and deception, one that is not based on the accused, but on the accuser.

This alternate model of truth and lie detection, based not on the accused but on the accuser, can be seen in the second quote that comes from a sixteenth century carnival play. Specifically, I will compare a short comedy, *The Hot Iron* from Hans Sachs—which uses a hot iron as a comical means of detecting deception—with fMRI technology. In this drama from 1551, a wife accuses her husband of adultery and requires the husband to “carry a hot iron to prove his innocence or guilt.”¹⁰ Through trickery and reversal, the husband convinces the wife to do the same, and she is burned. In the quote above, the wife’s companion shudders at the potential pain of the hot iron and decides not to accuse given her own indiscretions.

This seemingly asymmetrical comparison—data from “high tech” with a 450-year-old burlesque stage production—is an intentional attempt to offer a means to question our contemporary definitions of “truth” and “lies.” While

⁷ Kozel, Pagett, and George, “A Replication Study,” 852.

⁸ Melissa Littlefield, *The Lying Brain: Lie Detection in Science and Science Fiction* (Ann Arbor: The University of Michigan Press, 2011), 2.

⁹ Lorraine Daston and Peter Galison, *Objectivity* (New York: Zone, 2007), 3-4.

¹⁰ Hans Sachs, “Das heyß Eysen” in *Werke*, Vol. 9 (Stuttgart: Spemann, 1875), 85.

paying attention to changing historical, religious, secular, humanist, and technological habits and beliefs, not to mention popular and judicial allegiances, the tension among various loyalties in the dramatic production will hopefully make clear that defining and narrating the actuality of events is not as easy as Kozel's technology claims. Drawing attention to the culture of accusation, rather than the body of the accused, reveals specific invisible assumptions that should be accounted for in any attempt to determine and then detect truth and lies. Focus on the objective determination of "actual events," particularly the power to name, gains a new meaning in this comparative approach.

After a brief history of various theories of naming within cultural discourses—from Plato, Nietzsche, and Judith Butler—I will explore the "hot iron" as a parody of medieval methods of determining truth and deception. Thereafter, I will return to contemporary fMRI techniques with new insights into understanding how we construct a truthful narrative in order to "accuse" within a cultural context. This comparative method problematizes the focus on the body of the accused, whether burned bodies in the Renaissance or brain images in the twenty-first century.

History of Naming and Comparative Method

Using Plato, Nietzsche, and Butler as theoretical guides to explore the construction of truth and lies situates this article in a particular epistemological tradition, yet the decision to focus on a sixteenth-century German play may seem an odd comparison to fMRI Brain images. Histories of lie detection—like Marston's from 1938 and Trovillo's two-volume history from 1939—are plentiful and the need to revisit the body of the accused is superfluous. In order to focus on the culture of accusation, we need a brief history of naming and the authority behind proper and improper speech. Only then will the asymmetrical comparison become clear.

One of the earliest versions of the problem of names appears in Plato's *Cratylus*, where two figures, Cratylus and Hermogenes, debate the status of names. Are names natural or conventional, either recognized as already existing or created through social interaction?¹¹ Socrates answers their dilemma with irony and equivocation: names are conventional tools, but the proper use of names allows one to access the "essence" of that which the name names. Though conventional, proper use appears through legislation, or philosophers. Truth then becomes authority through law. Deception, more often than not, occurs through ignorance of the proper use of these tools, not in any intentional misuse.

¹¹ Plato, *Cratylus*, trans. Benjamin Jowett (Cambridge: MIT, 2008), unpaginated.

Kozel's definition of objective truth applicable to fMRI machines picks up at least one of these threads, replacing the philosopher with scientist and fMRI machine. The contemporary concept and value of "objectivity" as a product of nineteenth and early twentieth-century social and scientific concerns, however, did not exist in the ancient world.¹² In *Cratylus*, authority of naming is cultural and social, based on a social position and authority of the philosopher. The second part of this truth/lie binary is ignorance: there is no mention of intentional deception. In an absolute sense, all lies are the result of ignorance.

The emphasis on legislation of the Absolute introduces a cultural and social paradox into the naming process: truth is a negotiation, yet once that battle is won, it becomes absolute. Friedrich Nietzsche (1844-1900) offers an example of negotiated truth that does away with the need for the absolute. In his well-known essay, *On Truth and Lies in a Non-Moral Sense* (1873), Nietzsche claims that truth is a social construct, not a description of reality. For Nietzsche, there is no way to access the "form," "essence," or "thing in itself."¹³ Caught between two competing nineteenth century epistemologies—the Hegelian Absolute and newly developing concept of objectivity, Nietzsche proposed that the need for "truth" was both a drive and myth. Truth appeared as a drive to fit into societal norms and myth of uniformly valid designations for things: truths are lies we have forgotten are lies.

Judith Butler's proposal that the appearance of any substance is a "constructed identity" offers a way to negotiate the problem of essence, objectivity, and myth.¹⁴ Though she applies this scheme to a theory of gender formation, we can also use it to recognize true and deceitful statements. Recognizing something as it is (rather than not recognizing it or naming it as something else) requires a process of constructing an appearance within an accepted cultural framework. For Butler, who was influenced by Nietzsche and Foucault, one who names halts power relationships that are already at work within a community. Naming does not situate itself in opposition to reality that exists in platonic categories or Nietzsche's acceptance of lies. For Butler, truth and naming are instances of power.¹⁵

For Nietzsche and Butler, naming, or calling a thing a thing, constitutes a reality that in another setting could be otherwise. Though they draw attention to

¹² Daston and Galison, *Objectivity*, 40.

¹³ Friedrich Nietzsche, "Über Wahrheit Und Lüge Im Außermoralischen Sinn," in *Sämtliche Werke, Kritische Studienausgabe*, eds. Giorgio Colli and Mazzino Montinari (Munich and New York: De Gruyter, 1980), 873-890.

¹⁴ Judith Butler, "Performative Acts and Gender Constitution: An Essay in Phenomenology and Feminist Theory," *Theatre Journal* 40, no. 4 (1988): 519.

¹⁵ Butler, "Performative Acts and Gender Constitution," 527.

and criticize the platonic emphasis on legislation and knowledge, organizing a series of events into a narrative is the sustained activity of a group of individuals rather than the action of one isolated agent. In this view of truth as a social construction, deception can then be seen as a variable practice of drawing attention to power relationships within a group rather than an act of opposition to, or repression of, what actually occurred.

If we accept there are a multiplicity of truths (and lies), and in order to provide examples of this truth construction at work, comparison becomes a very important methodological tool. A statement is “true” or “a lie” because of similarity and difference, which is itself a comparison of unlike categories of speech with the material world. Comparison, as a method, allows one to define 1) the point of view from which categories are created and compared, and 2) the *tertia comparationis* of categories to be compared.¹⁶ After this definition of comparison, Deville states that everything in comparative work hinges on the setup and running of the comparator, and since comparison is by definition relative, following this process in two different forms reveals much about the processes of truth formation.

In setting up his dialogue, Plato has Socrates use comparison when he writes that, in different locations, there are different names for the same things.¹⁷ Nietzsche uses comparison when he places various languages side by side.¹⁸ Butler uses comparison when emphasizing the citationality of all speech.¹⁹ Even Kozel et al. uses comparison when setting up the fMRI imaging experiment through selecting subjects, aggregating data, and interpreting results.²⁰ Comparison, as a method, is not simply an ironic postmodern tool: it can be meaningfully employed to outline, even if incompletely, the contours of the problem of naming, concealing, and the epistemological assumptions by which one names things and controls other “deceptive” names.

A popular sixteenth-century carnival play, though unsuspecting in its representations of truth and deception, offers what Krause calls “asymmetrical” comparison to the negotiation between truth and lies found in modern brain

¹⁶ Joe Deville, Michael Guggenheim, and Zuzana Hrdličková, “Introduction: The Practices and Infrastructures of Comparison,” in *Practicing Comparison*, eds. Joe Deville, Michael Guggenheim, and Zuzana Hrdličková (Manchester: Mattering Press, 2016), 30.

¹⁷ Plato, *Cratylus*, unpaginated.

¹⁸ Nietzsche, “Über Wahrheit Und Lüge,” 873.

¹⁹ Butler, “Performative Acts and Gender Constitution,” 527.

²⁰ Kozel, Pagett, and George, “A Replication Study,” 853-854.

imaging.²¹ Asymmetrical comparison draws attention to the familiar in the seemingly unfamiliar, so that even in the most rigorous of scientific experiments, difference is arbitrarily created, enshrined, and disseminated. Krauss shows that asymmetrical comparison emphasizes the rearrangement of signs across fields and systems of knowledge.²² Without such a comparison, the products of the strategic aims of modern research—typically truth and lies, similarity and difference, or data—remain at best under-exploited, at worst intentionally concealed.

By comparing the latest iteration of lie detection through brain imaging with an example from early modern Germany, I am not advocating a return to a previous episteme of analogous yet empty ideas, or a truth sustained by some supernatural *a priori* divinity, platonic form, or universally valid narrative. As I have shown in my recent book, a traditional comparison between knowledge of the brain in the sixteenth and twenty-first centuries would be impossible given the diverse epistemological assumptions and radically different brain objects.²³ By way of Nietzsche and Butler, asymmetrical comparison provides a guide by which to compare constructions of truth and deception that I hope will expose what Foucault calls, “codes of culture—those governing its schemas, values, and the hierarchy of perception, [...] and the empirical orders with which [we] will be dealing and within which [we] will be at home.”²⁴ As with any comparative study, exposing the *tertia comparationis* and the running of the comparator are of utmost importance. Here, the *tertium comparationis* is not truth, lies, or the brain; rather, it is the position of accusation within a culture of acceptable lies.

Hot Irons, Deception and Early Modern Allegiance

Hans Sachs, a writer and shoemaker from Nuremberg, Germany, is known in the historical literary canon for his moral poetry and popular carnival plays.²⁵ Though he is not directly seen as an advocate for detecting truth and lies, I will

²¹ Monika Krause, “Comparative Research: Beyond Linear-Causal Explanation,” in *Practicing Comparison*, eds. Joe Deville, Michael Guggenheim, and Zuzana Hrdličková (Manchester: Mattering Press, 2016), 58.

²² Krause, “Comparative Research,” 59.

²³ Jameson Kismet Bell, *Performing the Sixteenth-Century Brain: Beyond Word and Image Inscriptions* (Münster: Lit Verlag, 2018), 52.

²⁴ Michel Foucault, *The Order of Things: An Archaeology of the Human Sciences* (New York: Random House, 1970), xx.

²⁵ Maria E. Müller, *Der Poet der Moralität. Untersuchungen zu Hans Sachs. Europäische Hochschulschriften* (New York: Peter Lang, 1985), 57-63.

use one of his carnival plays, *The Hot Iron*, to uncover what Judith Butler calls a “social fiction [...], a sedimentation that over time has produced a set of corporeal styles which, in reified form, appear as the natural configuration of bodies.”²⁶ Butler argues that the construction of discreet genders in binary relations to one another is a social function, not a natural necessity. If one applies this term “sedimentation” to truth formation, like Nietzsche’s “forgetting”, the sites of repetition of a name become marks or traces of embedded power relations. We can revisit and follow traces of certain “true” and “deceptive” binaries that restrict the multiple possibilities of experience. As we will see in *The Hot Iron*, Hans Sachs uses these binaries to portray acceptable behaviors and therefore correct patterns of seeing truthfully and looking for deception. The negotiation of truth requires allegiance to specific types of truth, not a recognition of the absolute truth.

The Hot Iron is a comical play that revolves around a hot iron used as a detector of true and deceptive speech and practice. Almost as important as the play itself is the time in which it was performed: carnival. Victor Turner, among others, has shown that carnival in Early Modern European contexts, as an iteration of ancient Saturnalia, was a liminal space and time. Summarizing other research, Turner writes that carnival “refers to the period of feasting and revelry just before Lent, including Mardi Gras in France, Fastnacht in Germany and Shrove Tide in England.”²⁷ Sachs wrote the play for a festive time characterized by “unruliness,” “disorder,” “mockery” and “anything may go”; socially accepted lies—gender and political roles, social positions, and symbols—were reversed, subverted, or revealed as “plastic.”²⁸ It is from this liminal context of the reversal of truth and lies that we can position ourselves to take a brief look at Sachs’ *The Hot Iron*.

Three characters—a wife, husband, and wife’s friend—use the hot iron to reveal traces of acts done in secret (adultery). As both a judicial tool and a plot device, the hot iron will burn the guilty and spare the innocent. The action begins when the wife accuses the husband of adultery and orders him to carry a hot iron that has been placed inside a chalk ring. If he is burned, he is guilty. If he remains untouched, he is innocent. The husband, afraid of being burned by the hot metal, secretly places a piece of wood in his palm and successfully carries the iron outside the circle. After his “miraculous” acquittal and in a fit of anger combined with a desire for revenge, he orders his wife to prove her faithfulness by carrying the hot iron. After protesting—she asks her friend to

²⁶ Butler, “Performative Acts and Gender Constitution,” 524.

²⁷ Victor Turner, “Frame, Flow, and Reflection: Ritual and Drama as Public Liminality,” *Japanese Journal of Religious Studies* 6, no. 4 (December, 1979): 475.

²⁸ Turner, “Frame, Flow, and Reflection,” 480-484.

carry the iron for her, but is refused because the friend admits to having had many affairs in the past—the wife confesses she had multiple affairs throughout the town. As a punishment, the husband again orders her to carry the iron; she reluctantly does and is burned. In the end, rather than a lie detector, the hot iron becomes a tool of retribution.

The hot iron from the play can be classified as type of Ordeal, calling on a divine power to enter nature and judge in human affairs. This cultural technology had fallen out of practice by the mid-sixteenth century. When Hans Sachs wrote *The Hot Iron* in Nuremberg in 1551, imperial German cities had already established the use of witnesses, jury trials, and other types of procedural proof of a person's guilt or innocence.²⁹ If one was accused of wrong doing, surviving an Ordeal was no longer necessary to publicly prove one's innocence. In Nuremberg, since the beginning of the fifteenth century, the Inner and Outer Councils decided criminal cases—the precursor of modern trial by peers—depending on the severity of the accusation.³⁰ The councils consisted of only eligible citizens of the city and its surrounding territories—mayors, patricians and guildsman—who could judge the accusations, the defense, and punishment in order to protect the common life of the city. Ziegler and Holenstein dispute the dates at which oath swearing and Ordeals fell out of fashion: Ziegler argues that Ordeals and oaths disappeared at the onset of the Early Modern Period,³¹ while Holenstein shows that swearing oaths and modified forms of the Ordeal existed until well into the eighteenth century.³² Both Ziegler and Holenstein agree, however, that the form and cultural significance of the Ordeal and the oath changed from the High Middle Ages to the Early Modern Period, roughly the sixteenth century. This shift was the result of religious and secular groups struggling for control of both physical and psychological territories, thus requiring new modes to secure allegiance and detect treachery.

What are the physical and psychological territories in question in *The Hot Iron* and how were true and deceptive statements negotiated? If it follows that one's experience of the world is a specific construction, then the wife accuses

²⁹ Cecil Hedlam, *The Story of Nuremberg* (London: Dent & Co, 1908), 150.

³⁰ Harmut Kuntsmann, *Zauberwahn und Hexenprozess in der Reichstadt Nürnberg*, Vol. 1 (Nürnberg: Nürnberger Werkstücke zur Stadt- und Landesgeschichte, 1970), 122.

³¹ Vicki Ziegler, *Trial by Fire and Battle in Medieval German Literature* (New York: Camden, 2004), 6.

³² Andre Holenstein, "Seelenheil und Untertanenpflicht. Zur gesellschaftlichen Funktion und theoretischen Begründung des Eides in der ständischen Gesellschaft," in *Der Fluch und der Eid: Zeitschrift für historische Forschung*, ed. Peter Blicke (Berlin: Dunker, 1993), 40.

her husband of adultery *not* because she saw him commit the act, but because his behavior did not fit the accepted practice of being a man, regardless of “the truth.” She is accusing him of breaking categories of masculinity and spousal duties, as well as projecting her own guilt. As we see in the following lines, the wife saw her husband act *not husband-like* and desired proof of her perception, not his acts:

The Hot Iron
 (A Carnival Play for 3 People)
The Wife Speaks
 I’ve had my husband for four years,
 I liked him a lot more back then.
 My love for him is already snuffed
 Out and my heart is strangled.
 [...]
 The Wife Speaks: (to husband)
 I recently think you are an adulterer;
 Let it be, that you exonerate yourself,
 This is not an easy accusation.³³

From these lines, the husband could have been a standout worker, an influential politician, or simply a lazy individual who spent the day drinking beer under the sun. In her accusation, the wife becomes a guardian, or protector of a specific habit of perception and the social order that fostered that type of perception. In addition, as told from a male author, the wife projects her cuckolding practice onto her husband, which was a secret fear of many if not all medieval and early modern households.

Along with domestic affairs, Hans Sachs dramatizes a power struggle between religious and secular authority to define the household by having the wife appeal to the supernatural, the hot iron, through which God would determine truth and deception. In this context, the Prince or duke of an imperial city had the right to require allegiance to the civic codes of social relationships of a particular confession—Protestant, Catholic, Calvinist, etc.—established by his authority.³⁴ This secular judicial practice set itself in opposition to one’s allegiance to an absolute divine order. If one swore an oath to God and to the church, one neglected one’s duties to the secular authority, and vice versa. In this power struggle, we can see the change in the meaning of an oath and Ordeal in early modern justice; by swearing an oath, one states that one will

³³ Hans Sachs, “Das heyß Eysen,” 84.

³⁴ Holenstein, “Seelenheil und Untertanenpflicht,” 26.

belong to a certain group of people who experience and thus act in a certain way. Controlling this allegiance, this oath, was paramount to both religious and secular leaders and the battle over oath-swearing rituals changed what it meant to experience the world.

The medieval oath was an oath of honor: one swore an oath and through the act of swearing, one became a trustworthy individual.³⁵ The problems inherent in this ubiquitous use of oath swearing became apparent to late medieval and early modern society. In *The Hot Iron*, the oath of fidelity the husband swore at marriage bound him not only to his wife and God, but to the secular authority and to the community. He, in turn, assumed the oath to be valid and durable. Unless there was a clear deviation from the accepted rules of behavior and perception, the oath was considered valid:

The Husband

I am secretly hurt by her.
I never bothered her to ask
If she kept her honor or not.³⁶

Whether an inattentive husband or himself a womanizer, the husband states that only an accusation would lead to a change in the facts. For the husband, a fictional narrative continued as fact until it was compared with another narrative. In these lines, the husband would be running a comparator of symmetry: the newly revealed cheating wife does not conform to his image of the faithful wife, where the category of “wife” links both “honorable” and “dishonorable.” In the play, the use of names such as “Wife” and “Husband” are themselves categories, discourses with certain acceptable and unacceptable behaviors. The resulting difference reveals the lies we accept as fiction until we recognize them as lies. At the same time, the “truth” that we believe is based on belonging to certain social group with established fictions and authorities to guard them.

Achim Landwehr, a researcher in early modern police records, describes binary relationships between fact and fiction found in *The Hot Iron* also depicted in court records. For the working-class society (not yet the repressed Marxian proletariat, but the ‘handworker’ class at the end of feudalism), the household was the strongest and most repeated act of social stability.³⁷ Through church and judicial records, Landwehr describes the complicated power

³⁵ Ziegler, *Trial by Fire*, 33.

³⁶ Hans Sachs, “Das heyß Eysen,” 87.

³⁷ Achim Landwehr, *Repertorium der Policyordnungen der Frühen Neuzeit, Bd. 4: Baden und Württemberg* (Vittorio Klostermann: Frankfurt a.M., 2001), 197.

relationships rising from a man (husband) or woman (wife) failing in their household duties. The husband confirms the “proper” image of the household in the following lines:

The Husband

If she wanted to keep her piety,
After living such passionate days and nights,
She should have been honorably quiet.³⁸

“Piety” and “honor”—known fictions since they bookend the wife’s “passionate days and nights” —can only be kept with wife’s silence. Accusation, if anything, reveals the position from which one accuses. The latent economic, religious, political, and social dynamics in the majority of church and court records are just that: latent and invisible. To accuse, to name, is to force something into being. A husband who drinks too much, is physically violent, abstains from church, steals, does not pay taxes, or mismanages money is simply a bad husband. A wife who does not cook enough, reads too many books, complains, allows her in-laws to stay too long, makes her husband a cuckold, or does not care for the children properly is simply a bad wife.³⁹ If we were to take visible performance of a good ‘household’ or ‘not household-like’ as the true narrative, we can easily discuss truth and deception. The hot iron, even if useless as a lie detector, reveals the naming of power relationships that separate into a multiplicity of allegiances of belonging and excluding. Bringing this pattern to our attention hopefully allows for the possibility to recognize things, ideas, and power relationships that we, in contemporary culture, because of our own allegiances to certain modes of power, do not recognize.

As we transition from the Early Modern Period back to contemporary neuroscience, its assumptions and varied allegiances, being open to the possibility of multiple narratives is important to engaging fMRI brain images as lie detectors. If we assume my premise, that constructing truth and deception requires that one belong to a specific group of common believers from which to accuse, then both *The Hot Iron* and fMRI brain images become dependent on the social context and the construction of a specific narrative, rather than the manifestation of a burnt body or blood flow in the brain. We cannot deny that new technology provides a vast amount of information. However, the questions one asks to acquire that data, and the answers received, provide as much information about the cultural narrative of truth and deception as seeing those questions represented in digitized flesh.

³⁸ Hans Sachs, “Das heyß Eysen,” 93.

³⁹ Achim Landwehr, *Policey im Alltag. Die Implementation frühneuzeitlicher Policeyordnungen in Leonberg* (Vittorio Klostermann: Frankfurt a.M., 2000), 195.

Brain Images: The Body's Technological Language

If we examine the construction of a modern scientific narrative, and look specifically at Kozel's argument that one can see both 'the truth' and 'deviation from that truth' in brain images, the construction of a truthful narrative and the codes on which the narrative is built, leads to a third option between the mind and brain: in whatever form the brain takes, we are performing it through various cultural positions and the network of values built up around those beliefs.⁴⁰

Given Kozel's original position and our journey through a representation of sixteenth century lie detection, what might the truthful narrative they propose to detect in the brain be? The comparison between the hot iron and the fMRI machine becomes apparent through a quick summary of Kozel's procedures, which reads like a casting call and a script for a theatrical production.

After finding a suitable group of volunteers, the volunteers are taken to a room in which fifty dollars is placed under two of six objects. While in the fMRI machine, the participants are shown various objects that are in the room and asked to click "yes" or "no" when the object appears under which the fifty dollars has been placed. The participants are told they will receive fifty dollars if they answered truthfully. They would receive another fifty dollars if they can deceive a lab technician who did not know where the money is placed (in fact, all participants will receive the extra fifty dollars). The results of the subjects' truthful or deceptive responses were compared with the actual location of the money.⁴¹ The fMRI scanner could detect blood flow in brain regions in truthful and deceptive responses. Since, per their assumptions, the truthful response is encoded in the deceptive response, one can assume that areas of the brain active during truthful responses subtracted from areas active during deception will give a region of the brain active during deception.⁴²

On the surface, this appears to be a simple arithmetical problem. The researchers have removed all variables to provide the optimum chance to visualize the brain both recognizing the true events (six objects under which there are two other objects) and then repressing that knowledge and giving an intentionally deceptive response. However, if one is to investigate the codes on which this narrative is constructed, to look away from the brain image by which truth and deception are represented, the technological imperative becomes less transparent and more of a road block, that which, like the early modern hot

⁴⁰ Jameson Kismet Bell, "The Performativity of a Historical Brain Event: Revisiting 1517 Strassburg," in *The Neuroscientific Turn in the Humanities*. Ed. Melissa Littlefield and Jenell Johnson (Ann Arbor: University of Michigan Press, 2012), 65-66.

⁴¹ Kozel, Pagett, and George, "A Replication Study," 853.

⁴² Kozel, Pagett, and George, "A Replication Study," 853-55.

iron, stares at viewer in an authoritative manner. The experiment itself also becomes more carnivalesque than the researchers would want readers to find.

Clearly, it would be unwise to doubt that there is activity in the brain during language production. Part of the authority of the fMRI is that it can detect that which human senses cannot. In contrast to other technological forms of lie detection—the polygraph—Kozel et al. argues that, because the data collected is data about the brain and the polygraph only detects a body's peripheral response, it can directly detect deception. However, fMRI imaging detects changes in blood oxygenation levels, or movement of oxygen from areas of low to higher density through metabolic processes. That blood levels equate to truth and lies is a type of constructed seeing rather than a recognition of the truth. In naming this act, namely that blood moves during thought, one can see the power struggles between various types social, technical, legal, and epistemological practices.

W. Marston, one of the early proponents of using the polygraph to discover truth through deception, wrote the goal concisely in 1938: "It is necessary to test for some emotion which will not be present unless the person is lying.... Some one bit of behavior which would always mean a person is lying."⁴³ The fMRI machine is supposed to be the most advanced iteration of this biological maxim: it offers truth through its transparency because it merely collects data about the body. The researcher, as with the polygraph, only needs to compare a brain telling the truth with a lying brain. The difference between the two should then be irrefutable. Yet by using an fMRI machine, just as one uses language, one automatically limits both the questions asked and the answers the body offers to the authority of certain power structures.

If we return to Judith Butler's interpretation of speech acts, this correspondence between language and the material world breaks down in use. In stating something, one cites that which has already been said, arresting power dynamics in the moment of stating.⁴⁴ Objectivity, the goal of contemporary science since the mid-nineteenth century, is the slow process of carving away that which can be said by citing only the data and the procedures of its production. In the creation of objective data, there is a historical force behind the data that both subsumes the subject in its historicity and creates the subject as belonging to the group of users of that data. In Kozel et al.'s study, one can see a community of believers form and the development of a language of belonging within diverse and competing power structures. The power of fMRI, as with the hot iron, does not allow one to accuse, it compels in order to belong.

⁴³ W. M. Marston, *The Lie Detector Test* (New York: Smith, 1938), 32.

⁴⁴ Judith Butler, *Excitable Speech: A Politics of the Performance* (New York: Routledge, 1997), 50.

Truth, or the accepted fiction, has already been negotiated prior to the machine's use and the recognition of "deception" allows one to belong to a particular epistemic group in the following manner of running the comparator. First, the subjects are all (paid) volunteers. In a sense, they have already ascribed to the authority of the machine. Second, those not qualified to participate in the study are excluded: subjects who have certain physiological traits that would limit the machine's accuracy in uniform data collection are omitted. Pregnancy, medication, history of psychiatric disorders, younger than eighteen, older than forty, substance abuse/dependence, illiteracy, claustrophobia, medical implants, criminality, or recent caffeine and nicotine use were all reasons for exclusion.⁴⁵ Third, certain individuals are excluded after the testing procedure because they did not follow protocol.

In addition to the above-mentioned construction techniques and selection procedures, the actual brain used for the image in the publication was not of any of the patients. In order to remove variation in individual brains shapes, it is standard practice in fMRI image presentation to use a brain image generated from a software program.⁴⁶ The image used in the article replaced the variations that occur in brains of actual people in favor of a more aesthetically pleasing, symmetrical and easily manipulated representation of a virtual brain. A compilation of data from the 10 participants was then superimposed on the artificial brain to provide a visual correlation to deception (red and yellow indicate areas used for deception).

Depending on how one interprets the process of data collection versus the presentation of data collected, the authors have presented deception itself. However, like in carnival, the exclusion of socially unacceptable lies, the purposeful misleading of another, [that which] is ubiquitous in society and in medicine— was suspended for the duration of the experiment. The terms change as well: images are "smoothed" "reoriented" and "adjusted"; subjects were "excluded" "limited" "screened" and therefore "statistically significant."⁴⁷ Within the liminal space of the experiment, Turner's "anything may go" holds firm and accepted lies of culture were suspended for the more useful lies of the experiment. Adina Roskis confirms the carnival nature of such experiments when she separates the "experimental" from the "external" contexts,

While such measures are relatively effective at distinguishing these [truth and deception] in the experimental contexts in which they are developed, there are deep problems with external and ecological

⁴⁵ Kozel, Pagett, and George, "A Replication Study," 853-855.

⁴⁶ Kozel, Pagett, and George, "A Replication Study," 854.

⁴⁷ Kozel, Pagett, and George, "A Replication Study," 852-856.

validity, and little insight into content-related aspects that could elevate them into true mindreading experiments.”⁴⁸

By limiting exactly who belongs to this group and how they must respond to be a part of the group—what one might call a biological oath swearing—Kozel created a language of belonging that did not exclude lying from the true narrative. In fact, the authors have actually included lying as a central part of the discursive practice of those who belong to the group. A closer look at their procedures may shed more light on the meaning of truth and lies and the construction of the culture of accusation, rather than a judgment of objectivity.

The Construction of Truth from Lies

Proposing to offer a valid alternative to the easily duped polygraph test, Kozel opens the article in *Behavioral Neuroscience* with the following statement that justifies the use of fMRI technology in lie detection,

Understanding the neurocircuitry involved in deception could have a profoundly beneficial impact on society. Deception, defined as the purposeful misleading of another, is ubiquitous in society and in medicine. Understanding the brain basis of deception could lead to both a method in which deception is accurately detected and to a better understanding of disorders in which deception is a prominent component (e.g., antisocial personality disorders).⁴⁹

Placing the social benefits of a more rigorous lie detector to the side for a moment, if one explores the techniques of data collection and turns away from the surface image, data from fMRI testing performs essentially the same function as polygraphs (contrary to the authors’ statement or belief), and the hot iron. Each of these tools registers biological variations that are believed to occur when an individual is telling either a true statement or a deceptive statement.⁵⁰ Kulynych shows the legal status of such a lie detector remains unclear. Her comparison of an fMRI machine to a “crystal ball” invokes medieval methods where the common element is the faults in the technology and the prejudicial factors that far outweigh the probative value.⁵¹ What’s more,

⁴⁸ Adina Roskis, “Mindreading and Privacy,” in *The Cognitive Neurosciences V*, eds. Michael Gazzaniga and George Mangun (Cambridge: MIT Press, 2014), 1008.

⁴⁹ Kozel, Pagett, and George, “A Replication Study,” 852.

⁵⁰ Jennifer Kulynych, “Psychiatric Neuroimaging Evidence: A High-Tech Crystal Ball?” *Stanford Law Review* 49, no. 5 (1997): 1254.

⁵¹ Kulynych, “Psychiatric Neuroimaging Evidence,” 1262.

companies who are selling fMRI technology as lie detectors are mainly in the business of determining guilt or innocence in cases of fraud and divorce.⁵²

Conclusions

Through asymmetrical comparison—lie detection through fMRI image with a hot iron from the sixteenth century—we have brought the invisibility of the following cultural assumptions to the foreground: the *tertium comparationis* of the position of the accuser and the acceptance of lies a particular culture. The unspoken value of contemporary bio-tech research demonstrates the mythical character of the modern age: machines are authoritative, statistics equate to truth, and deception can be written on individual bodies. From within this domain, one is allowed to accuse, and one is allowed to name.

Those without the authority behind the machine—jurors, judges, and everyone but researchers with million dollar grants—have a similar option as the audience 450 years ago watching Hans Sachs’ play, *The Hot Iron*: either wait to be accused or take part in the social construction of truth and deception. If those outside of the bio-tech sectors do not participate in this negotiation process, the Phillips Intera 3.0T Imaging Machine (or its international competitors) has the potential to become what the *judicium dei* did in Medieval times: provide a single source of power for defining social relationships. Thankfully, a recent collection of scholars across the humanities and sciences are negotiating the legal, epistemological, social, and cultural aspects of the brain research.⁵³

All the same, as with the renaissance and the twenty-first century, at least there will be an eclectic dialogue around the construction of what it means to be truthful or deceitful, even if that means we first also see ourselves and our technologies as accusers. To modify Nietzsche maxim, *to accuse* is the first step in the creation of truth, which is also the first step in belonging to a group of tolerable deceivers. Only then might we be able recognize the authorities by which we are allowed to accuse. Kozel et al.’s motivational statement offers insight into the paradox of truth and deception: “Deception is ubiquitous in society and medicine.”⁵⁴ What matters is not that we lie, but which lies we turn into the truth. In a few years, hopefully we can speak as Hans Sachs’ wrote in a typical end to one of his dramas

⁵² Margaret Talbot, “Duped: “Can Brain Scans Uncover Lies?” *The New Yorker*, July 2 2007.

⁵³ Melissa Littlefield and Jenell Johnson, eds, *The Neuroscientific Turn in the Humanities*, (Ann Arbor: University of Michigan Press, 2012): 1-28.

⁵⁴ Kozel, Pagett, and George, “A Replication Study,” 852.

Hans Sachs wishes that no more
filth to be proven through the hot iron.⁵⁵

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⁵⁵ Sachs, "Das heyß Eysen," 97.

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