

MERCHANTS OF DECEPTION: THE DECEPTIVE ADVERTISING OF FMRI LIE DETECTION TECHNOLOGY

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I. INTRODUCTION

Cutting-edge neuroscience is advancing at an incredible rate. Technologies like functional magnetic resonance imaging (hereinafter "fMRI") are becoming more sophisticated and precise. The maturation of these technologies has recently provided researchers with a glimpse at the nearly real-time operation of the brain.¹ Most importantly, new technologies allow for scientific studies of subjects' brains while the subjects are being exposed to stimuli.² This functional view of the brain permits studies that observe brain function while subjects perform other actions. For example, researchers can observe the brain while a subject is simultaneously asked questions or shown photographs or videos.³ Certain studies using fMRI technology have been intentionally structured in such a way that the subject will consciously deceive the researcher in response to the researcher's questioning.⁴ These studies

¹ See *infra* Part II.A for a discussion of the real time imaging of the brain that is provided by fMRI technology.

² *Id.*

³ Mark Harris, *MRI Lie Detectors*, IEEE SPECTRUM (Aug. 2010), <http://spectrum.ieee.org/biomedical/imaging/mri-lie-detectors/> ("To the accompaniment of various clicks and clacks, a screen above my head flashes a series of questions in front of my eyes.").

⁴ See Langleben, *infra* note 44.

have begun to correlate the activity of certain parts of the brain with certain behavior, such as deception. One application of such technology is the creation of a new lie detector which could take the place of the polygraph — an instrument that has been largely discredited in the legal field.⁵

Currently, entrepreneurs are marketing the latest lie detection technology.⁶ The marketing of such research raises important questions about whether the state of the science has matured to such a degree that the company claims are warranted. Most of the legal scholarship on fMRI technology focuses on the issues that may be impacted by fMRI lie detection.⁷ However, little legal attention has been given to the commercial advertisement of the technology.⁸ This Note will focus on the online advertisement of the technology, arguing that both No Lie MRI and Cephos Corporation are marketing functional neuroimaging in a manner that violates consumer protection law under the Federal Trade Act.

Part II of this Note will examine the science behind the nascent field of fMRI. Part III will then discuss the theoretical applications of fMRI-based research and the importance of decisive action by the Federal Trade Commission (hereinafter “FTC”). Part IV will explicate the FTC’s regulatory framework as it pertains to deceptive advertising. Part V of the Note will describe the specific claims made by both of the leading marketers of fMRI lie detection, namely No Lie MRI, Inc. and Cephos Corp., while Part VI will explain why these companies’ claims violate the FTC’s consumer protection laws regarding the advertisement of commercial products. Finally, Part VII will propose solutions that the FTC should adopt to correct the deceptive advertising.

⁵ See discussion of polygraph evidence, *infra* Part II.A.

⁶ The two primary companies that have marketed neuroscience technologies are No Lie MRI, Inc., and Cephos Corporation. See CEPHOS CORP., <http://www.cephoscorp.com> (last visited Nov. 26, 2010); NO LIE MRI, <http://www.noliemri.com> (last visited Nov. 26, 2010).

⁷ As of September 23, 2010, a LexisNexis search for: fMRI or “functional MRI” within twenty words of “lie detection” yielded forty-nine results; an impressive result for a narrow topic within the fledgling field of “neurolaw.”

⁸ Consumer protection issues appear to have only been raised once, and briefly. See Stacey A. Tovino, *Imaging Body Structure and Mapping Brain Function: A Historical Approach*, 33 AM. J. L. AND MED. 193, 226 (2007).

II. THE SCIENCE BEHIND FMRI

A. The Polygraph's Alleged Bigger Brother

For decades, the primary device for detecting deception has been the polygraph. In the legal setting, polygraphs have received negative treatment from the United States Supreme Court for their limited reliability.⁹ In *United States v. Scheffer*,¹⁰ the Court noted that there is no agreement among scientists as to the accuracy rate of polygraph tests.¹¹ The Court's ruling coincided with the majority of states enacting *per se* rules against the admissibility of polygraph evidence.¹² However, the polygraph nevertheless continues to remain pertinent to post-conviction issues such as probation.¹³

The polygraph's failure to gain acceptance can largely be attributed to the physiological responses it measures. The polygraph functions by measuring physiological responses such as pulse, blood pressure, and galvanic response.¹⁴ One of the more popular means by which to measure the physiological responses is through asking comparison questions (also known as a comparison question test).¹⁵ Physiological responses are evaluated by asking and comparing different types of questions including any relevant questions (e.g., "Did you commit the murder on March 4, 2010?"), control questions that do not deal with the

⁹ *United States v. Scheffer*, 523 U.S. 303, 309 (1998).

¹⁰ *Id.*

¹¹ *Id.*

¹² *See, e.g., State v. Domicz*, 907 A.2d 395, 411 (N.J. 2006) (stating that thirty-one states currently have a *per se* rule against polygraph evidence or have not addressed the issue).

¹³ For example, the Colorado Department of Public Safety conducted a study that it claimed demonstrated the polygraph's ability to spot high-risk behaviors in adult sex offenders. *See* KIM ENGLISH ET AL., COLO. DEP'T OF PUB. SAFETY, THE VALUE OF POLYGRAPH TESTING IN SEX OFFENDER MANAGEMENT 21 (Dec. 2000), available at <http://dcj.state.co.us/ors/pdf/docs/revisepolyrpt6.pdf>.

¹⁴ *See also* Kati Singel, *Origin of the Modern Polygraph*, UNIV. OF MARY WASHINGTON, http://www.umw.edu/hisa/resources/Student%20Projects/Singel/students.umw.edu/_ksing2os/polygraph/origin.html (last updated Apr. 10 2005).

¹⁵ *See* COMM. TO REVIEW THE SCIENTIFIC EVIDENCE ON THE POLYGRAPH, THE NAT'L ACAD. OF SCIS., THE POLYGRAPH AND LIE DETECTION 74 (2003), available at http://books.nap.edu/openbook.php?record_id=10420&page=R1 [hereinafter POLYGRAPH REPORT]; William G. Iacono, *Effective Policing: Understanding How Polygraph Tests Work and are Used*, *Criminal Justice and Behavior*, 35 *CRIMINAL JUSTICE AND BEHAVIOR* 1295, 1295 (2008).

particular event (e.g., “Have you ever taken something that did not belong to you?”), and irrelevant questions (e.g., “Are you sitting on a chair?”).¹⁶ Deceptive individuals are expected to show heightened physiological responses to the relevant questions, whereas truthful individuals are predicted to show the opposite pattern of response; that is, they will demonstrate a heightened response to the control questions.¹⁷ A pattern of consistently heightened responses to the relevant questions rather than to the control questions allows the examiner to infer deception.¹⁸

One of the primary reasons why the legal community has not embraced the polygraph may be because of the inherent problems associated with measuring physiological responses, and the lack of well-developed theoretical models of the physiological processes underlying the peripheral measurements taken by the polygraph.¹⁹ Physiological responses are, in some sense, removed from the decision to lie since responses like sweating and pulse are part of the peripheral nervous system that can be triggered by a variety of stimuli, apart from the act of engaging in deception. The difficulty with the polygraph test is that there inherently exists an ambiguity in its findings as to whether the response is due to deception or other physiological responses that may be associated with truthfulness.²⁰ Another shortcoming of the polygraph is the difficulty in applying it outside of the laboratory. In its investigatory findings, The National Academy of Sciences concluded that ambiguity associated with the real world examinee population — as opposed to the laboratory subject population — almost certainly limits accuracy when the polygraph test is applied outside the laboratory.²¹

Neuroimaging machines, on the other hand, are viewed as providing a more direct measurement of deception because they measure the physiology of the brain itself, as opposed to the physiology of the peripheral nervous system.²² Thus, in some sense, neuroimaging

¹⁶ Gershon Ben-Shakhar, *A Critical Review of Control Question Test (CQT)*, in HANDBOOK OF POLYGRAPH TESTING 4 (Murray Kleiner ed., 2002), available at http://www.openu.ac.il/Personal_sites/Gershon-Ben-Shakhar/CQTCHAP4.pdf.

¹⁷ *Id.* at 4-5.

¹⁸ *Id.* at 5.

¹⁹ See POLYGRAPH REPORT, *supra* note 15, at 93.

²⁰ *Id.* at 4.

²¹ *Id.*

²² See Singel, *supra* note 14.

machines like fMRIs seek to go to the “source” of the lie, i.e. to the brain of the individual where the conscious decision to deceive the examiner presumably took place.²³

A multitude of recent studies have demonstrated an ability to identify certain regions of the brain associated with active deception through fMRI technology. This type of lie detection attempts to uncover information about what an individual knows by seeking to identify specific brain patterns that are believed to be more active when an individual engages in conscious deception.²⁴ The accuracy of predicting deception currently varies; however, some studies claim to have reached ninety percent accuracy.²⁵ Two companies—No Lie MRI, Inc. (hereinafter “No Lie MRI”) and Cephos Corp. (hereinafter “Cephos”)—have already begun to commercialize and market fMRI technology, allowing people to be scanned in an attempt to prove their innocence.²⁶ These companies operate websites touting their ability to detect deception. Their claims are strong enough that one must ask whether the advertising of their services constitutes deceptive advertising. The first step in determining whether there is false advertising is to explain how fMRI technology operates.

B. How Does Functional Brain Imaging Work?

fMRI scanning utilizes magnets to detect changes in the levels of oxygenated blood in the brain.²⁷ Active neurons utilize oxygen and, therefore, require a greater amount of hemoglobin-rich blood to provide them with the oxygen required to function.²⁸ Computers can interpret the difference between the way that deoxygenated blood (i.e. blood that has been “used” by the brain) and oxygenated hemoglobin (i.e. blood that

²³ However, as will be discussed in Part V, fMRI lie detection suffers from the same difficulties as the polygraph insofar as applying it to individuals outside the laboratory setting.

²⁴ See Langleben, *infra* note 44.

²⁵ F. Andrew Kozel et al., *Detecting Deception Using Functional Magnetic Imaging*, 58 *BIOLOGICAL PSYCHIATRY* 605 (2005). Steven Laken, the chief executive officer of Cephos, is a co-author of Kozel’s study; therefore, it should be noted that there may be a conflict of interest.

²⁶ See generally CEPHOS CORP., *supra* note 6; NO LIE MRI, *supra* note 6.

²⁷ See David G. Norris, *Principles of Magnetic Resonance Assessment of Brain Function*, 23 *J. MAGNETIC RESONANCE IMAGING* 794, 794-95 (2006).

²⁸ *Id.*

has not yet been “used” by the brain) respond to the magnets.²⁹ This difference is referred to as the Blood Oxygenation Level Dependent (hereinafter “BOLD”) effect.³⁰ The underlying assumption is that an increase in BOLD signifies an increase in blood flow and it is believed to indicate neural activity.³¹ fMRI scans are administered while the person being scanned performs various tasks, such as answering a question, observing a picture, or hearing a sound. Scans occurring during these activities reveal the parts of the brain being activated during the specific tasks.³²

Because of its complexity, many people misunderstand exactly how fMRI works. Thus, it may be helpful to illustrate the process by way of an analogy. Imagine a worldwide tsunami warning system that overlays colors onto a map of the world, with the color of a geographic location varying in response to the perceived level of threat. To accomplish this, instruments (seismographs) are used to measure vibrations within the earth.³³ The designers of the system must establish a threshold level of vibration specifying the point at which a warning will not register on the map. This threshold is critical: set the threshold too low and the warning will activate too frequently; set it too high and it may miss important vibrations. Yet, it is important to understand that the threshold is in a sense arbitrary, because it is not a natural phenomenon. After a threshold is set and the map is created, one must then make the initial inference that the increased vibrations reliably

²⁹ *Id.*

³⁰ *Id.*

³¹ *Id.* at 798. Note that there are other technologies that similarly leverage physiological response to increased neuronal activities. For example, PET and SPECT scanning operate by recording the distribution of radioactive tracers that are injected into the bloodstream, ultimately ending up in the brain. These tracers are attached to molecules that the brain will use, most notably either oxygen or glucose. Therefore, more tracers accumulate in parts of the brain that are active because active neurons in the brain require blood and glucose for energy. These technologies as well as magnetoencephalography were in use before the fMRI. However, neither has been attempted to be adapted as a lie detection device, presumably because their spatial resolution (i.e. the quality of the data) is lower than that of fMRI machines. See generally David G. Norris, *Principles of Magnetic Resonance Assessment of Brain Function*, 23 J. MAGNETIC RESONANCE IMAGING 794, 794 (2006) (discussing problems with the spatial and temporal resolution of different imaging technologies).

³² See *infra* Part III.C for a discussion of Langleben’s playing card study.

³³ See *Earthquake Glossary*, U.S. GEOLOGICAL SERV., <http://earthquake.usgs.gov/learn/glossary/?term=seismograph> (last visited Dec. 4, 2010).

indicate an increase in activity of the earth's plates, rather than some other phenomena, such as a methane gas eruption. With that inference made, one must make a second inference: that an increase in activity of the earth's plates corresponds to an increased likelihood of a tsunami. Since these inferences occur after looking at the map, the inferences drawn must rely to some extent on the initial threshold vibration level.³⁴

Likewise, for regions of the brain to show up as "active" on the fMRI radiological images (i.e., as colors), the investigator must specify a threshold level of fMRI data that qualifies as the BOLD threshold.³⁵ In our tsunami analogy, this would be the threshold level of vibration that is required for the vibration data to appear on the map as a warning area. The lower the vibration level required for warnings, the more warnings that will register on the map. Likewise, with fMRI scanning, the lower the threshold, the more regions appear as "active" colored regions on the scan.³⁶ In this sense, an individual analyzing an fMRI image is very much like the individual looking at the map in that she depends, whether consciously or not, on the threshold determination when drawing subsequent inferences about the subject's physiological or psychological state.

III. WHY THE FTC SHOULD ACT

The FTC has taken a proactive approach to issues regarding the advertising of health or medical products. In its Deception Statement, the FTC concluded that it automatically deems claims or omissions to be material in advertising if they "... significantly involve health, safety, or other areas with which the reasonable consumer would be concerned."³⁷ However, it is unclear if fMRI-based lie detection will be viewed as involving health or safety *per se*. In other words, since fMRI-

³⁴ It is worth noting that, even without the use of a map, the same inferences are required. That is, a threshold level of activity must be set such that a reading will trigger an alarm or alert of some kind.

³⁵ See Appendix 1 for an example of an fMRI image.

³⁶ As previously stated, the use of a map is not necessary. As long as the fMRI companies claim to "verify" the veracity of a given statement, it will be necessary for them to specify a threshold reading that would allow them to conclude that the subject is lying. This is an inherent necessity in their claim that they can verify. The problems with these claims of "truth verification" will be described *infra* Part IV.B as they pertain to consumer protection violations.

³⁷ See Deception Statement, *infra* note 69, at 182.

based lie detection is not a drug or device that claims to treat illness or disease, it is unclear whether it falls into the category of health or safety products that would trigger stricter FTC scrutiny. Nevertheless, the stakes regarding the advertising of fMRI-based lie detection technologies could not be higher. One need only look at potential ways that a bona fide fMRI lie detection device would influence our society to appreciate the need for the FTC to approach this issue with urgency. If consumers are allowed to embrace a flawed conception of fMRI technology based on the advertising of No Lie MRI and Cephos, many of the issues that would arise with a bona fide lie detector threaten to materialize here as well.

A. *Multiple Constitutional Issues at Stake*

Neuroimaging, whether anatomical or functional in nature, raises serious concerns about the right to privacy as well as a defendant's Fourth and Fifth Amendment rights against unreasonable searches and seizures and self-incrimination, respectively.³⁸ Can fMRI studies that show possible deception be admitted without the consent of the defendant? Attorney and former professor of biology John New points out that "an initial question that must be asked is whether results of brain activity measurement should be considered by the legal system to be physical evidence or actual testimony by the individual."³⁹ Treating fMRI data as physical evidence, as is the custom for DNA or fingerprints, is an attractive approach given that fMRI data is a physical measurement of a concrete, tangible phenomenon.⁴⁰ However, if classified as physical evidence, the recording of brain activity by way of neuroimaging could be compelled in criminal cases and used against the accused by the prosecution.⁴¹ On the other hand, if neuroimaging evidence is considered testimony, then the argument could be made that any inclusion would violate the defendant's right against self-incrimination. Regardless, the legal community will have to determine which strategy best promotes justice.

³⁸ See generally Michael S. Pardo, *Neuroscience Evidence, Legal Culture, and Criminal Procedure*, 33 AM. J. CRIM. L. 301 (2006). Polygraph testing has also been subject to questions as to whether it infringes on an individual's Fifth Amendment rights.

³⁹ John New, *If You Could Read My Mind*, 29 J. LEGAL MED. 179, 193 (2008).

⁴⁰ *Id.*

⁴¹ *Id.* at 194.

The powerful constitutional issues discussed above should prompt the FTC to act swiftly to ensure that those marketing and conducting what they believe are fMRI lie detectors actually accomplish what they promise. Arguments can be made that the benefits of an actual fMRI-based lie detector would outweigh these constitutional concerns. However, it is clear that the benefits of the technology in its current state do not outweigh these concerns. Allowing current fMRI-based methods for detecting deception to be marketed as bona fide lie detection devices could alter the constitutional landscape while providing little in return.

B. Government Involvement in fMRI development

fMRI-based lie detection could also change the way that governments interrogate suspects. United States government agencies, like the Central Intelligence Agency, are interested in using cutting-edge neuroscience for interrogation.⁴² However, the companies remain quite secretive of their connections to the government.⁴³ The Defense Advanced Research Projects Agency (DARPA) funded a widely cited study by University of Pennsylvania neuroscientist Daniel Langleben.⁴⁴ The study is cited on No Lie MRI's "publications" section of their website.⁴⁵ In the study, Langleben presented participants with an envelope containing two playing cards, as well twenty dollars.⁴⁶ The participants were shown a semi-random series of playing card images displayed on a projector that could be viewed by the participant while being scanned in the fMRI machine.⁴⁷ The participants were instructed

⁴² See Ian Sample & David Adam, *The Brain Can't Lie*, THE GUARDIAN, Nov. 20, 2003, <http://www.guardian.co.uk/life/feature/story/0,13026,1088572,00.html> (last visited Nov. 26, 2010).

⁴³ In an interview, No Lie MRI's CEO Joel Huizenga stated that, "We are dealing with the military. The guys in the field are asking for this technology. They want to know whether people are telling them the truth or telling them lies." However, Huizenga "refuses to provide any specifics, other than saying that No Lie MRI hopes shortly to secure government funding for a multimillion-dollar, 1200-person study." Harris, *supra* note 3.

⁴⁴ See Daniel D. Langleben, *Telling Truth From Lie in Individual Subjects with Fast Event-Related fMRI*, 26 HUMAN BRAIN MAPPING 262, 271 (2005) (acknowledging that DARPA provided funding for the study).

⁴⁵ *Press and Publications*, NO LIE MRI, <http://www.noliemri.com/pressNPubs/Publications.htm> (last visited Nov. 26, 2010).

⁴⁶ See Langleben, *supra* note 44, at 263.

⁴⁷ *Id.*

to signify whether the card on the screen was the card they possessed; however, they were also specifically instructed to deny possession of one of the two cards they possessed when they saw that card projected.⁴⁸ Langleben reported being able to determine whether the individuals were being deceptive based on the fMRI data.⁴⁹

Given the inherent inadequacy of using current fMRI technology as a device for detecting deception, the FTC should take seriously the marketing of the technology for such purposes. The government is a consumer that, though sophisticated, may also need consumer protection, as it is often the consumer of cutting-edge technology that is developed or discovered in universities. Moreover, state politicians and agencies may not be as sophisticated or well-versed in the limitations of fMRI-based lie detection, and may believe the strong claims that marketers of the technology put forth on their websites.

C. Powerful Findings Raise Questions for the Criminal Justice System

fMRI technology also applies to issues outside the scope of lie detection. In fact, a new area of law has been coined called “neurolaw” to account for the vast influence that modern neuroscience has had on our legal system.⁵⁰ Recent neuroimaging studies have identified a network of brain regions involved in moral processing that may alter our notions of free will and moral blameworthiness.⁵¹ For example, researchers at the University of Southern California found that certain areas of the brain’s cortex were “activated when subjects performed tasks involving moral conundrums.”⁵² Other neuroimaging studies have found that patients with lesions in the prefrontal cortex (the portion of the brain behind the forehead) show impaired moral judgment in emotional dilemmas.⁵³

⁴⁸ *Id.*

⁴⁹ *Id.*

⁵⁰ See Steven K. Erickson, *Blaming the Brain*, 11 MINN. J. L. SCI & TECH. 27, 34-35 (2010) (describing the birth of “neurolaw.”).

⁵¹ See generally Stephan Hamann & Carla L. Harenski, *Neural Correlates of Regulating Negative Emotions Related to Moral Violations*, 30 NEUROIMAGE 313 (2006).

⁵² Adrian Raine & Yaling Yang, *Neural Foundations to Moral Reasoning and Antisocial Behavior*, 1 SOCIAL COGNITIVE & AFFECTIVE NEUROSCIENCE 203, 207 (2006).

⁵³ Elisa Ciaramelli et al., *Selective Deficit in Personal Moral Judgment Following Damage to Ventromedial Prefrontal Cortex*, 2 SOCIAL COGNITIVE & AFFECTIVE

In addition to moral judgments, neural corollaries of other aspects of human cognition have been found that may likewise affect our theories of punishment, most notably that of intention. In 2004, researchers found that certain parts of the motor cortex and prefrontal cortex are triggered when individuals engage in intentional activities.⁵⁴ In the future, it is conceivable that defendants will voluntarily undergo brain scanning in order to measure if the areas of the brain that are known to deal with the formation of intent are functioning at the level expected for a healthy individual. If a defendant's scan turns out to be "abnormal," how should this affect the punishment and sentencing of the individual?

The aforementioned findings pose a difficult question for those who view punishment by the legal system as retributivist in nature. More specifically, such findings may call into question whether society is justified in punishing the behavior of an individual when the part of their brain governing intent is shown to function abnormally. If the neural machinery of moral judgments and intent are compromised due to a brain injury or defect, larger questions about that individual's blameworthiness arise. If neuroscience undercuts the ability to assign blame to certain individual actions, the retributivist theory of punishment may be greatly attenuated. In turn, some commentators are theorizing that fMRI research could have profound changes on the sentencing of individuals.⁵⁵

The far-reaching impact of neuroscience findings should prompt the FTC to aggressively regulate fMRI marketing for improper usage. Failure to regulate the marketing of such products could contribute to a broad acceptance by judges and juries of the claims by companies like No Lie MRI and Cephos. Given that judges and juries have a tremendous capacity to influence the inner-workings of our justice system, the FTC should act to prevent such a scenario from unraveling.

NEUROSCIENCE 84 (2007); Michael Koenigs et al., *Damage to the Prefrontal Cortex Increases Utilitarian Moral Judgments*, 446 NATURE 908 (2007).

⁵⁴ John-Dylan Haynes et al., *Reading Hidden Intentions in the Human Brain*, 17 CURRENT BIOLOGY 323 (2007); Hakwan C. Lau et al., *Attention to Intention*, 303 SCIENCE 1208, 1208-10 (2004).

⁵⁵ See Henry T. Greely, *Neuroscience and Criminal Justice: Not. Responsibility But Treatment*, 56 KAN. L. REV. 1103, 1003-1104 (2008) ("I, too, believe that advances in neuroscience will change, dramatically, the criminal justice system... [W]e may see major changes in how crimes are investigated, in how trials are conducted, in how sentencing decisions are reached, and in what kinds of sentences are imposed.").

IV. THE FTC FRAMEWORK FOR DECEPTIVE TRADE PRACTICE DETERMINATIONS

This section will describe the FTC's current policy with respect to deceptive advertising. The FTC's policy is particularly helpful because many states have adopted its general framework for approaching deceptive marketing.

A. History of the FTC and the FTC Act

The Federal Trade Communications Act (hereinafter "FTC Act") empowered the FTC to regulate a broad variety of trade practices.⁵⁶ However, the FTC did not always possess such broad authority. As enacted in 1914, the FTC was only empowered to "prevent persons, partnerships, or corporations . . . from using unfair methods of competition in commerce."⁵⁷ At this point, the FTC was not charged with preventing deceptive practices.⁵⁸ Eventually, the FTC Act would broaden its focus to include regulation of "unfair methods."

This broadening began with the 1938 Wheeler-Lea Act⁵⁹ which amended Section Five of the FTC Act, declaring deceptive practices in commerce to be illegal, and empowering the FTC to challenge both "unfair," as well as "deceptive" trade practices.⁶⁰ The Wheeler-Lea Act also provided the FTC with the authority to take action against the false advertising of foods, drugs, and cosmetics.⁶¹ This law also specifically provides the FTC with the authority to issue preliminary injunctions against such advertisements.⁶²

Though Section Five of the FTC Act became — and still is — the primary tool by which actions are brought alleging deceptive acts, the original Act was a blunt instrument, generally approaching both "unfair" and "deceptive" practices under a single standard.⁶³ The precision of FTC regulations was later sharpened somewhat by case law

⁵⁶ 15 U.S.C. § 41 (2009).

⁵⁷ Act of Sept. 26, 1914, ch. 311, § 5(a), 38 Stat. 717, 719 (codified at 15 U.S.C. § 45(a)).

⁵⁸ *See generally id.*

⁵⁹ Act of Mar. 21, 1938, ch. 49, § 3, 52 Stat. 111 (codified at 15 U.S.C. § 45(a)).

⁶⁰ *Id.*

⁶¹ *Id.* at ch. 49, §§ 4-5, 52 Stat. 111, 114 (codified at 15 U.S.C. §§ 52-57).

⁶² *Id.*

⁶³ *See, e.g., F.T.C. v. Sterling Drug*, 317 F.2d 669 (2d Cir. 1963).

that produced a refined standard, which focused on whether or not the practice in question had the “tendency and capacity” to mislead.⁶⁴ In the 1965 seminal case *F.T.C. v. Colgate-Palmolive Co.*,⁶⁵ the Supreme Court articulated the standard for deceptive practices, opining that, “the misrepresentation of *any* fact, so long as it materially induces a purchaser’s decision to buy, is a deception prohibited by § 5.”⁶⁶

Nonetheless, as in 1914, the FTC Act remained silent as to what exactly “unfair” or “deceptive” meant in the context of the Act. This vagueness led to criticism of the FTC.⁶⁷ In response to such criticism, the FTC issued a letter to Congress in 1984 — known as the “Deception Statement” — which sought to clarify the FTC’s policy on deceptive trade practices.⁶⁸

However, the Deception Statement *qua* letter had no actual legal authority. The legal authority of the policy set forth in the Deception Statement was augmented when the FTC included the entirety of the letter in its appendix to the FTC’s decision in *In re Cliffdale Associates*.⁶⁹ By including the Deception Statement in *Cliffdale Associates*, the Deception Statement “became the legal standard which the Commission had to apply in all future deception cases.”⁷⁰

Federal courts have also adopted the policy explicated in the Deception Statement.⁷¹ Furthermore, the federal judiciary is highly deferential to the Commission’s findings in general.⁷² Additionally, the Deception Statement has been “widely used as guidance in the

⁶⁴ See, e.g., *Charles of the Ritz Distribs. Corp. v. F.T.C.*, 143 F.2d 676, 679-80 (2d Cir. 1994); *U.S. Retail Credit Ass’n v. F.T.C.*, 300 F.2d 212, 221-22 (4th Cir. 1962).

⁶⁵ *F.T.C. v. Colgate-Palmolive Co.*, 380 U.S. 374 (1965).

⁶⁶ *Id.* at 387 (emphasis in original).

⁶⁷ See Richard Posner, *The Federal Trade Commission*, 37 U. CHI. L. REV. 47, 47-89 (1969).

⁶⁸ In 1980 the FTC published an “Unfairness Statement” clarifying the term “unfair practices,” but this is outside the scope of this paper. *In re Int’l Harvester Corp.*, 104 F.T.C. 949, 1070 app. n.41 (1984), available at <http://www.ftc.gov/bcp/policystmt/ad-unfair.htm>.

⁶⁹ *In re Cliffdale Assoc. Inc.*, 103 F.T.C. 110 app. (1984) [hereinafter “Deception Statement”].

⁷⁰ *Amrep Corp. v. F.T.C.*, 768 F.2d 1171, 1178 (10th Cir. 1985).

⁷¹ See *F.T.C. v. Pantron I Corp.* 33 F.3d 1088, 1096 n.19 (9th Cir. 1994); *U.S. v. Locascio*, 357 F. Supp. 2d 536, 549 (E.D.N.Y. 2004).

⁷² *Kraft, Inc. v. F.T.C.*, 970 F.2d 311 (7th Cir. 1992) (citing *F.T.C. v. Indiana Fed’n of Dentists*, 476 U.S. 447, 454 (1976); *Hospital Corp. of Am. v. F.T.C.*, 807 F.2d 1381, 1384 (7th Cir. 1986), *cert. denied*, 481 U.S. 1038 (1987)).

interpretation of state consumer protection statutes. . . .”⁷³

Procedurally, once the Commission decides to take action against a party, it has two options. Part Three of the FTC Rules of Practice allows the FTC to file a claim for administrative adjudication.⁷⁴ Alternatively, Section 13(b) of the FTC Act allows the Commission to file a complaint in federal court.⁷⁵ However, the focus has begun to shift to the federal courts as the primary means of adjudication.⁷⁶

B. *The Deception Statement*

1. Generally

To apply the FTC’s policy on deceptive trade practices to the advertisements for cutting-edge neuroscience products, it is first necessary to discuss the self-imposed requirements that the FTC must meet in order to bring a deceptive advertising claim. The Deception Statement begins by describing what it believes to be the common elements to all deceptive trade practices. Generally, the Commission will find a practice to be deceptive if:

1. There is a representation, omission, or other practice,
2. That misleads the consumer acting reasonably in the circumstances,
3. To the consumer’s detriment.⁷⁷

The Commission supplements this standard by describing in detail its different aspects.

2. Representation, Omission, or Other Practice

The first requirement of a deceptive practice is a representation, omission, or practice.⁷⁸ The Deception Statement provides examples of misleading and deceptive practices, including false oral or written representations, misleading price claims, sales of hazardous or

⁷³ Jean Braucher, *Deception, Economic Loss and Mass-Market Customers: Consumer Protection Statutes as Persuasive Authority in the Common Law of Fraud*, 48 ARIZ. L. REV. 829, 848-49 (2006).

⁷⁴ Commencement of Proceedings, FTC Rules of Practice for Adjudicative Proceedings, 16 C.F.R. §3.11 (2010).

⁷⁵ 15 U.S.C. § 53(b) (2010); 16 C.F.R. § 3.2 (2010).

⁷⁶ ABA SECTION OF ANTITRUST LAW, CONSUMER PROTECTION HANDBOOK 41-42 (2004).

⁷⁷ See Deception Statement, *supra* note 69, at 183.

⁷⁸ *Id.* at 170.

systematically defective products or services without adequate disclosures, failure to disclose information regarding pyramid sales, use of bait and switch techniques, failure to perform promised services, and failure to meet warranty obligations.⁷⁹ The Commission further states that a misrepresentation can be either an express or implied statement contrary to fact.⁸⁰ The FTC has defined an “express claim” as a claim literally made in the advertisement.⁸¹ For example, “ABC Mouthwash prevents colds” is an express claim that the product will prevent colds.⁸² An implied claim, as defined by the FTC, is a claim made indirectly or by inference.⁸³ For example, an advertisement stating that “ABC Mouthwash kills the germs that cause colds” contains an implied claim that the product will prevent colds.⁸⁴ With respect to omissions, the Commission states that an omission may be considered a misrepresentation if qualifying information necessary to prevent a practice, claim, representation, or reasonable expectation or belief from being misleading is not disclosed.⁸⁵

3. Misleading a Consumer Acting Reasonably

The second factor that the FTC investigates is the impact of the practice in question from the perspective of the consumer acting reasonably under the circumstances.⁸⁶ If the representation or practice affects or is directed primarily to a particular group, the FTC examines reasonableness from the perspective of that group.⁸⁷ Generally, the FTC will find deception if the average consumer would be deceived, if a significant number of consumers would be misled, or if the advertisement is aimed at a particularly vulnerable audience that is

⁷⁹ *Id.*.

⁸⁰ *Id.*

⁸¹ *Frequently Asked Advertising Questions: A Guide for Small Business*, FED. TRADE COMM’N, <http://www.ftc.gov/bcp/edu/pubs/business/adv/bus35.shtm> (last visited Nov. 29, 2010).

⁸² *Id.*

⁸³ *Id.*

⁸⁴ *Id.*

⁸⁵ *See* Deception Statement, *supra* note 69 at 170. *See In re Int’l Harvester Corp.*, 104 F.T.C. 949, 1070 (1984) (making clear that the omission of information about a product may be deceptive in certain circumstances).

⁸⁶ *See* Deception Statement, *supra* note 69 at 171.

⁸⁷ *Id.*

likely to be misled.⁸⁸

4. Materiality Requirement

The third factor — the most complex of the three — asks whether or not the representation, omission, or practice is “material” in nature.⁸⁹ As the FTC describes:

The basic question [concerning the materiality requirement] is whether the act or practice is likely to affect the consumer’s conduct or decision with regard to a product or service. If so, the practice is material, and consumer injury is likely, because consumers are likely to have chosen differently but for the deception. In many instances, materiality, and hence injury, can be presumed from the nature of the practice. In other instances, evidence of materiality may be necessary.⁹⁰

With respect to the materiality of a representation, omission, or practice, the FTC “will not generally require extrinsic evidence concerning the materiality of a challenged claim.”⁹¹ Furthermore, courts have upheld agency decisions even in light of expert testimony that there was no deception of individual consumers.⁹² In both *In re Thompson Medical Co.* and *Kraft v. F.T.C.*, the Commission concluded that, with respect to extrinsic evidence:

1. Express claims will not require extrinsic proof on the meaning of the advertisement,
2. Obvious implied claims, i.e. those that can be reasonably inferred from the express claims, no extrinsic proof will be required, though it will be considered if available; and
3. Implied claims that cannot be deciphered from examining the face of the ad will require some type of intrinsic proof.⁹³

5. Materiality Does Not Require Intent to Deceive

The Commission has maintained that scienter is not required for a

⁸⁸ DEE PRIDGEN & RICHARD M. ALDERMAN, CONSUMER PROTECTION AND THE LAW 727 (Thomson West 2008 Ed.).

⁸⁹ See Deception Statement, *supra* note 69 at 171.

⁹⁰ *Id.*

⁹¹ *Id.* at 192-93.

⁹² See *Bantam Books, Inc. v. F.T.C.*, 275 F.2d 680, 682 (2d Cir. 1960), *cert. denied*, 364 U.S. 819 (1960).

⁹³ PRIDGEN & ALDERMAN, *supra* note 88, at 768-69 (citing *Kraft, Inc. v. F.T.C.*, 970 F.2d 311 (7th Cir. 1992); *In re Thompson Med. Co.*, 104 F.T.C. 648 (1984)).

finding of deception.⁹⁴ This policy has been affirmed in a number of decisions, including *F.T.C. v. Verity International, Ltd.*, where the court stated that “deception need not be made with intent to deceive; it is enough that the representations or practices were likely to mislead consumers acting reasonably.”⁹⁵ The rationale for not requiring scienter is explicated in *F.T.C. v. Freecom Communications*, where the court found that Section Five of the FTC Act is meant to protect the consumer, thus warranting a focus on how the acts or practices will affect the consumer, not on the intent of the defendant.⁹⁶ Since materially deceptive claims under the FTC Act are presumed as a matter of law to cause injury to consumers, the FTC is not obligated to proffer evidence of the risk of injury.⁹⁷ Thus, the FTC’s framework bears a striking similarity to statutes imposing strict liability.

6. Materiality May At Times Be Presumed, Even Without Injury

Though certain parts of the Deception Statement appear to create a requirement of actual consumer injury, the Commission has not required actual injury for a finding of materiality.⁹⁸ The Deception Statement itself disavows the injury requirement, affirming previous Commission decisions that abandoned such a requirement.⁹⁹ From the Deception Statement, FTC decisions, and case law, it is clear that there are four circumstances where the Commission will presume materiality. Specifically, materiality will be presumed where the alleged violator:

1. Made an expressly false claim;
2. Should have known that the consumer needs information that was not disclosed;

⁹⁴ *F.T.C. v. Bay Area Bus. Council, Inc.*, 423 F.3d 627, 632 (7th Cir. 2005).

⁹⁵ *F.T.C. v. Verity Int’l, Ltd.*, 443 F.3d 48, 63 (2d Cir. 2006), *cert. denied*, 549 U.S. 1278 (2007).

⁹⁶ *F.T.C. v. Freecom Commc’ns*, 401 F.3d 1192, 1202, 1204 (10th Cir. 2005).

⁹⁷ See *In re N. Am. Philips Corp.*, 111 F.T.C. 150 (1988); *In re Gen. Nutrition, Inc.*, 113 F.T.C. 146, 243 (1986).

⁹⁸ See *F.T.C. v. Algoma Lumber Co.*, 291 U.S. 67, 78 (1934).

⁹⁹ *In re Cliffdale Assoc. Inc.*, 103 F.T.C. 110, 152 (1984) (citing *F.T.C. v. Colgate-Palmolive Co.*, 380 U.S. 374, 387 (1965); *In re Am. Home Prods. Corp.*, 98 F.T.C. 136, 368 (1981), *aff’d as modified*, 695 F.2d 681 (3d Cir. 1982) (defining materiality to include anything that affects purchasing decision, and holding that materiality will be found if post-purchase use of product is affected by advertisement); *In re Simeon Mgmt. Corp.*, 87 F.T.C. 1184, 1229 (1976), *aff’d*, 579 F.2d 1137 (9th Cir. 1978) (disavowing any requirement of a specific finding that actual injury has occurred)).

3. Intended an implied claim; or
4. Made a claim in any of several areas generally established as relevant to consumers, including the purpose of the product or service at issue; its efficacy, quality or performance; health or safety issues; cost; durability; or a warranty.¹⁰⁰

In *International Harvester*, the FTC explained that “. . . implied claims are material if they pertain to the central characteristics of the product, such as its safety, cost, or fitness for the purposes sold.”¹⁰¹ The rationale for abandoning actual injury is explained in *Freecom Communications*, where the Court stated that “[n]either proof of consumer reliance nor consumer injury is necessary to establish a § 5 violation . . . Otherwise the law would preclude the FTC from taking preemptive action against those responsible for deceptive acts or practices, contrary to § 5’s prophylactic purpose.”¹⁰²

The FTC has linked deception by omission to materiality, stating that, “depending on the facts, information pertaining to the central characteristics of the product or service will be presumed material.”¹⁰³ The Commission listed information dealing with the product’s purpose and efficacy as being material.¹⁰⁴

In *Kraft, Inc.*, the Seventh Circuit Court of Appeals concluded that the Commission was justified in finding that the claims in Kraft’s advertisements were material if they were deemed to be important to consumers and would influence the consumer’s purchasing decisions.¹⁰⁵ In *Kraft*, the Commission found that the consumer had significant health concerns that were triggered by Kraft’s claim that their cheese slices were superior to imitation slices in terms of their calcium content.¹⁰⁶ The court therefore ruled that the Commission properly inferred that Kraft’s claims of superiority were material.¹⁰⁷ The court also affirmed the Commission’s finding that the advertisement was deceptive.¹⁰⁸

In *F.T.C. v. QT, Inc*, a Federal District Court considered whether a

¹⁰⁰ See ABA SECTION OF ANTITRUST LAW, *supra* note 76, at 13.

¹⁰¹ *In re Int’l Harvester, Corp.*, 104 F.T.C. 949, 1056-57 (1984).

¹⁰² *F.T.C. v Freecom Commc’ns*, 401 F.3d 1192, 1203 (10th Cir. 2005).

¹⁰³ See Deception Statement, *supra* note 69, at 190.

¹⁰⁴ *Id.*

¹⁰⁵ *Kraft, Inc. v. F.T.C.*, 970 F.2d 311, 322 (7th Cir. 1992).

¹⁰⁶ *Id.* at 324.

¹⁰⁷ *Id.*

¹⁰⁸ *Id.* at 322.

bracelet advertisement, which claimed to provide immediate pain relief, was a deceptive marketing activity.¹⁰⁹ The manufacturer claimed in an advertisement that the bracelet provided immediate, significant, or complete pain relief,¹¹⁰ and that scientific tests proved its pain relief claims.¹¹¹ The Court upheld the FTC's ruling that the advertisement's claim was material, and that the advertisement was likely to mislead reasonable consumers.¹¹² To understand both the FTC and the courts' rulings in both *Kraft* and *QT*, it is necessary to discuss the substantiation requirement imposed on advertisers when they make claims like the one at issue in *QT*.

7. Substantiation Policy

The FTC's Deception Statement and the related case law provide general guidance for approaching deceptive advertising issues. Even if the first and third requirements of the deception statement are satisfied, (i.e. the requirement that the advertiser make a representation or omission and that such representation is material) the question of whether the advertisement is likely to mislead the consumer may still be difficult to answer. In order to determine whether an advertisement is likely to mislead a consumer, the FTC has employed two tools: the "falsity theory" and the "reasonable basis" theory.¹¹³ The falsity theory requires that the FTC prove that the claims made in the advertisement are demonstrably false, and the burden of proof is on the FTC.¹¹⁴ The reasonable basis theory requires that advertisers have a "reasonable basis" for any express or implied claims that their advertisement conveys.¹¹⁵ This policy was affirmed in the FTC's Statement on Advertising Substantiation, which states that "failure to possess and rely upon a reasonable basis for objective claims constitutes an unfair and deceptive act or practice in violation of Section 5 of the Federal Trade

¹⁰⁹ F.T.C. v. QT, Inc., 448 F. Supp. 2d 908, 955 (N.D. Ill. 2006), *aff'd*, 512 F.3d 858 (7th Cir. 2008).

¹¹⁰ *Id.* at 960.

¹¹¹ *Id.* at 961-62.

¹¹² *Id.* at 975.

¹¹³ See F.T.C. v. Pantron I Corp., 33 F.3d 1088, 1096 (9th Cir. 1994) (internal citations omitted).

¹¹⁴ See *id.*

¹¹⁵ Am. Home Prods. Corp. v. F.T.C., 695 F.2d 681, 693 (3d Cir. 1982).

Commission Act.”¹¹⁶

Initially, the FTC’s rationale for requiring substantiation was that unsubstantiated claims unfairly require the consumer to gamble on whether the product will meet the expectations conveyed by the advertisement.¹¹⁷ However, the FTC’s current favored rationale for the substantiation requirement is that unsubstantiated claims are inherently deceiving.¹¹⁸ The FTC’s reasoning is that, because the advertiser has not disclosed a material fact, the affirmative representation lacks the support that would be presumed absent some qualification.¹¹⁹

For example, the FTC held that Firestone Tire Company’s blanketed claims that its tire “stops 25% quicker” needed to be sufficiently substantiated by tests on a variety of road conditions.¹²⁰ Since Firestone had only tested its tires in one set of conditions, the FTC ruled that the company did not have a reasonable basis to substantiate its claim.¹²¹ Likewise, in *QT*, the defendant company was required to have a “reasonable basis” for their claim that the bracelet would provide pain relief to the wearer.¹²² Since *QT, Inc.* did not have the appropriate evidence to back up its claim, the FTC found that the unsubstantiated claims would likely mislead consumers.¹²³ As such, an advertiser’s failure to have a reasonable basis for an advertisement’s claims at the time the claims are made renders the advertising deceptive.¹²⁴

With respect to the level of substantiation required, the advertiser must have at least the level of support that it explicitly claims in its advertisements, and will also be required to provide support for any implied claims.¹²⁵ If an advertisement makes express representations

¹¹⁶ 49 Fed. Reg. 30, 999 (Aug 2, 1984), *reprinted in* 6 Trade Reg. Rep. (CCH) 39,060, available at <http://www.ftc.gov/bcp/guides/ad3subst.htm>.

¹¹⁷ See *In re Pfizer Inc.*, 81 F.T.C. 23, 67-69 (1972).

¹¹⁸ *Am. Home Prods. Corp.*, 695 F.2d at 692.

¹¹⁹ *Id.*

¹²⁰ *Firestone Tire & Rubber Co.*, 81 F.T.C. 398, 418 (1972).

¹²¹ *Id.* at 427.

¹²² *F.T.C. v. QT, Inc.*, 448 F. Supp. 2d 908, 961 (N.D. Ill. 2006).

¹²³ *Id.* at 965.

¹²⁴ See *Thompson Med. Co.*, 104 F.T.C. 648, 773-774 (opining that the advertisements were deceptive because Thompson did not have a reasonable basis to back up the claims in its advertisement).

¹²⁵ 49 Fed. Reg. 30, 999 (Aug 2, 1984), *reprinted in* 6 Trade Reg. Rep. (CCH) 39,060, available at <http://www.ftc.gov/bcp/guides/ad3subst.htm>.

regarding the level of substantiation, (e.g. “according to clinical studies” or “laboratory testing proves”) the FTC will require that the advertiser substantiate such claims.¹²⁶ An advertiser claiming that a scientific consensus exists on a certain issue will be required to provide evidence of such a consensus. Advertisements claiming that “research proves . . .” or that “laboratory science has perfected . . .” will need to be substantiated by competent scientific proof.¹²⁷

In practice, FTC substantiation cases generally fall into two main categories: claims regarding health and safety, and claims regarding a product’s efficacy.¹²⁸ Both require competent and reliable evidence such as research, studies, or other evidence from professionals in the relative area, conducted and evaluated by qualified individuals using generally accepted procedures.¹²⁹

Of particular importance to fMRI lie detection is the FTC’s policy that an advertisement may be deemed deceptive if there are unresolved scientific questions relevant to the advertisement’s claim that it omits or ignores.¹³⁰ In *National Commission on Egg Nutrition v. F.T.C.*,¹³¹ the Seventh Circuit upheld the FTC’s finding of deceptive advertising.¹³² The FTC had found that the Egg Commission’s advertising claim that there was “no evidence” that eggs contribute to heart disease was deceptive.¹³³ Because credible scientific studies did not support the contention that egg consumption posed no health risk, but rather that credible scientific evidence linked egg consumption to an increased risk of cardiovascular disease, the FTC concluded that there was no reasonable basis for the Egg Commission’s claims, consequently ruling them deceptive.¹³⁴ For respondents to make no mention of the scientific

¹²⁶ *In re Removatron Int’l Corp.*, 111 F.T.C. 206, 297 (1985).

¹²⁷ *Id.* at 298; *In re Porter & Dietsch*, 90 F.T.C. 770, 865 (1977).

¹²⁸ ABA SECTION OF ANTITRUST LAW, CONSUMER PROTECTION LAW DEVELOPMENTS 9 (2009).

¹²⁹ *See In re Novartis Corp.*, 127 F.T.C. 580, 670 (1996), *aff’d*, 223 F.3d 783 (D.C. Cir. 1996).

¹³⁰ *In re Nat’l Comm’n on Egg Nutrition*, 88 F.T.C. 89, 193 (1976), *enforced as modified*, 570 F.2d 157, 161 (7th Cir. 1977) (holding that the National Commission on Egg Nutrition cannot ignore the fact that many scientists cite studies demonstrating that the ingestion of eggs may increase heart disease).

¹³¹ *Nat’l Comm’n on Egg Nutrition v. F.T.C.*, 570 F.2d 157, 165 (7th Cir. 1977).

¹³² *Id.*

¹³³ *In re Nat’l Comm’n on Egg Nutrition*, 88 F.T.C. at 187-190.

¹³⁴ *Id.*

controversy surrounding this issue was, as the Court stated, patently false and misleading.¹³⁵

Furthermore, a determination of the level of substantiation that an advertiser must have is made on a case-by-case basis.¹³⁶ The FTC considers “the type of claim, the product, the consequences of a false claim, the benefits of a truthful claim, the cost of developing substantiation for the claim, and the amount of substantiation experts in the field believe is reasonable” in order to determine what comprises a reasonable basis.¹³⁷

V. THE CLAIMS

Both No Lie MRI and Cephos make claims regarding the science behind fMRI, the legal admissibility of fMRI, the observer independence of fMRI and the scientific community’s support of fMRI-based lie detection. These claims will be discussed in turn. This Note will then analyze the claims under the FTC’s approach to deceptive advertising as discussed in Part IV.

A. Claims Regarding the State of fMRI-based Lie Detection

Both No Lie MRI and Cephos make very strong claims that their fMRI technology can detect deception. No Lie MRI claims that “[t]he technology used by No Lie MRI represents the first and only direct measure of truth verification and lie detection in human history!”¹³⁸ Likewise, Cephos claims that it has developed “the latest, most scientifically advanced, brain imaging techniques for scientifically accurate lie detection.”¹³⁹

The companies’ representations fall into a category of representation that the FTC will presume to be material: those pertaining to the efficacy of the product. Both companies bill themselves as providing “truth verification” fMRI services. For example, No Lie MRI states that it provides “unbiased methods for the

¹³⁵ *Id.*

¹³⁶ 49 Fed. Reg. 30, 999 (Aug 2, 1984), *reprinted in* 6 Trade Reg. Rep. (CCH) 39,060, available at <http://www.ftc.gov/bcp/guides/ad3subst.htm>.

¹³⁷ *Id.*

¹³⁸ NO LIE MRI, *supra* note 6.

¹³⁹ CEPHOS CORP., *supra* note 6.

detection of deception and other information stored in the brain”¹⁴⁰ Furthermore, No Lie MRI claims to utilize techniques that “bypass conscious cognitive processing” by measuring “the activity of the central nervous system (brain and spinal cord) rather than the peripheral nervous system (as polygraph testing does).”¹⁴¹ These statements appear directly above an fMRI image of the brain and directly to the left of a photograph of a sophisticated-looking piece of medical imaging equipment that is presumably an fMRI machine.¹⁴² This fMRI brain image is annotated, with certain parts of the brain labeled as “lie” areas while another labeled as “truth” areas.¹⁴³ Cephos is no less zealous in its declaration of lie detection capabilities. On its website’s landing page, Cephos states that “[t]he source of lying is in the brain — this is what Cephos measures with our truth verification brain imaging service using fMRI technology. We provide independent, scientific validation that someone is telling the truth.”¹⁴⁴

B. Claims Regarding Legal Admissibility

Both Cephos and No Lie MRI make an additional claim regarding the purpose of their services: to be used in a court of law. Cephos states that “[w]e have offered expert testimony and have presented fMRI evidence in court”¹⁴⁵ and that “Cephos fMRI lie detection evidence is likely admissible in court.”¹⁴⁶ Likewise, No Lie MRI states that their results “could be used in a similar manner to DNA testing by adding the verification of an individual’s mental record. It would also potentially be possible for a witness to validate his or her own statements to the court.”¹⁴⁷

¹⁴⁰ NO LIE MRI, *supra* note 6.

¹⁴¹ *Id.*

¹⁴² *See id.*

¹⁴³ See Appendix 3 for a screenshot of the website.

¹⁴⁴ *The Technology Behind Lie Detection*, CEPHOS CORP., <http://www.cephoscorp.com/lie-detection/index.php#lie> (last visited Nov. 26, 2010).

¹⁴⁵ *Id.*

¹⁴⁶ *fMRI Testing & Legal Admissibility*, CEPHOS CORP., <http://www.cephoscorp.com/lie-detection/index.php#admissibility> (last visited Nov. 30, 2010).

¹⁴⁷ *Customers – Lawyers*, NO LIE MRI, <http://noliemri.com/customers/Lawyers.htm> (last visited Nov. 26, 2010).

C. Claims Regarding Observer Independence and Automation

Both companies expressly claim that their services are entirely processed by computers, with no human intervention. Cephos claims that “[a]ll ‘readings’ are performed by computers; thus, no human interpretations are required.”¹⁴⁸ Likewise, No Lie MRI states that its offering is fully automated and observer independent and therefore objective.¹⁴⁹ Claims of computer automation and observer independence are important representations, for such assertions portray the technology as being able to objectively detect deception without the need for human intervention.

D. Claims Regarding Scientific Credibility and Support

Furthermore, both companies claim that the scientific community backs their fMRI lie detection series. Specifically, No Lie MRI lists a “Scientific Board” comprised of three university professors.¹⁵⁰ No Lie MRI also has a separate page listing scientific publications.¹⁵¹ Cephos claims that a host of academic groups, including those at Harvard, Columbia, and the University of Pennsylvania, have all concluded that fMRI technology can distinguish between lies and truth.¹⁵²

VI. ANALYSIS OF CLAIMS UNDER FTC DECEPTIVE ADVERTISING PRINCIPLES

A. Companies’ Claims That Their Technology Can Directly Detect Deception May be False and Unsubstantiated

The FTC should have a relatively easy time proving that the companies have no substantiation for their claims that they can directly detect deception. As discussed above, current fMRI technology does not

¹⁴⁸ *Working with Cephos*, CEPHOS CORP., <http://www.cephoscorp.com/lie-detection/index.php#working> (last visited Nov. 26, 2010).

¹⁴⁹ *Product Overview*, NO LIE MRI, <http://noliemri.com/products/Overview.htm> (last visited Nov. 26, 2010).

¹⁵⁰ *Scientific Board*, NO LIE MRI, <http://noliemri.com/aboutUs/ScienceBoard.htm> (last visited Nov. 26, 2010).

¹⁵¹ *Scientific Publications*, NO LIE MRI, <http://noliemri.com/pressNPubs/Publications.htm> (last visited Nov. 26, 2010).

¹⁵² *fMRI Testing and Legal Admissibility*, CEPHOS CORP., <http://www.cephoscorp.com/lie-detection/index.php#admissibility> (last visited Dec. 4, 2010).

directly measure the neuronal activity of the brain.¹⁵³ In other words, fMRI technology does not measure the firing of neurons in the brain. Rather, as used in brain imaging, fMRI measures changes in blood flow to the brain.¹⁵⁴ This necessarily requires that any results gleaned from fMRI data depend on a chain of inferences.¹⁵⁵

Specifically, this chain of inferences requires an initial threshold determination of what constitutes the BOLD data that will be represented on the fMRI image.¹⁵⁶ The boundaries for what is or is not depicted in fMRI images are determined by “hemodynamic modeling.”¹⁵⁷ The BOLD signal is part of this modeling, and is represented in a complex statistical algorithm where certain variables must be specified.¹⁵⁸ In coming to a conclusion about what the image represents, we necessarily infer that BOLD data accurately represents increased neuronal activity. A second inference is required, namely that the neuronal activity depicted by the BOLD data is relevant to understanding and explaining deceptive brain states. A third inference requires us to conclude that a reading indicating a deceptive brain state is itself sufficient to establish that the subject has objectively lied. Arguably, the third inference is not required. This is because fMRI may be used to show a lack of activation in a certain area, that is, an area

¹⁵³ See *supra* Part II.B.

¹⁵⁴ See *id.* (discussing how fMRI measures changes in blood flow which are believed to indicate neural activity).

¹⁵⁵ Much of the inspiration for the explication, as well as the diagram in Appendix 4 is taken from Neal Feigenson’s article describing what he believes is the chain of inferences underlying fMRI scans. See Neal Feigenson, *Brain Imaging and Courtroom Evidence: On the Admissibility and Persuasiveness of fMRI*, 2 INT’L J.L. IN CONTEXT 233, 239 (2006). However, my chain of inferences is different. Feigenson describes the first step as being an inference, which I believe is misleading. On an abstract level, apart from how the technology is applied across studies, a threshold determination is required. Additionally, I believe that it is crucial to include the final inference regarding the finding of fact that is the ultimate step for anyone considering fMRI data in the legal context.

¹⁵⁶ See Appendix 4 for a chart of the inferences.

¹⁵⁷ See generally RICHARD S. J. FRACKOWIAK ET AL., HUMAN BRAIN FUNCTION (2d ed. 2003).

¹⁵⁸ K.J. Friston et al., *Nonlinear Responses in fMRI: The Balloon Model, Volterra Kernels, and Other Hemodynamic*, 12 NEUROIMAGE, 466, 469 (2000). “The BOLD signal $y(t) = \lambda v q E$ is taken to be a static nonlinear function of normalised venous [where] volume (v), normalised total deoxyhaemoglobin voxel content (q), and resting net oxygen extraction fraction by the capillary bed (E).” Friston goes on to discuss how certain variables must be provided in the function. *Id.*

showing a deficit of activity.¹⁵⁹ However, both fMRI-based lie detection companies market their products as if an objective determination can be made based on the presence of neuronal activity represented by increased blood flow.¹⁶⁰

As is apparent from the chain of inferences above, it is unlikely that fMRI data directly measures deception. No Lie MRI does not make an effort to convey that fMRI technology indirectly measures brain activity.¹⁶¹ Cephos does explain that its service is measuring blood flow, but nevertheless claims that it is a direct detection of deception.¹⁶² As the FTC has made clear in previous cases, if there is a representation that can be interpreted in both a misleading way and a non-misleading way, the advertiser is found to be deceptive.¹⁶³ As the representations by both companies that they can directly detect deception are false, they therefore violate FTC regulations.

B. No Reasonable Basis for Truth Verification Claims

Both companies make express representations about the accuracy of their services and refer to their use of fMRI technology as being able to “verify” the truthfulness of statements.¹⁶⁴ The use of the word

¹⁵⁹ For example, functional neuroimaging could theoretically be used to demonstrate the likelihood of a subject having a certain cognitive deficit. *See generally* Francesca Caramia et al., *Cognitive deficits in multiple sclerosis: a review of functional MRI studies*, NEUROLOGICAL SCIENCES (Aug. 6, 2010), <http://www.springerlink.com/content/h064618280756578/fulltext.html>.

¹⁶⁰ *See supra* Part V.

¹⁶¹ *How an MRI Works*, NO LIE MRI, <http://noliemri.com/products/HowMRIWorks.htm> (last visited Nov. 26, 2010). Instead of explaining the science behind the technology, No Lie MRI simply provides links to third party websites such as Wikipedia.org and HowStuffWorks.com.

¹⁶² *The Technology Behind Lie Detection*, CEPHOS CORP., <http://www.cephoscorp.com/lie-detection/index.php> (last visited Nov. 26, 2010) (stating that “[f]unctional magnetic resonance imaging (fMRI) is a type of specialized MRI scan that measures the changes in blood flow related to neural activity in the brain or spinal cord,” but then stating “[t]he source of lying is in the brain – this is what Cephos measures with our truth verification brain imaging service using fMRI technology. We provide independent, scientific validation that someone is telling the truth.”).

¹⁶³ *In re Jay Norris Corp.*, 91 F.T.C. 751, 836 (1978), *aff'd*, 598 F.2d 1244 (2d Cir. 1979); *In re National Comm’n on Egg Nutrition*, 88 F.T.C. 89, 185 (1976), *enforced in part*, 570 F.2d 157 (7th Cir. 1977).

¹⁶⁴ The header of No Lie MRI’s website advertises “New Truth Verification Technology.” *See* Appendix 3. Likewise, Cephos refers to its services as “lie detection/truth verification.” *Lie Detection*, CEPHOS CORP., <http://www.cephoscorp.com/lie-detection/>

“verification” is an implicit representation of an accuracy rate of one-hundred percent. This is particularly true in this context since the service offered would be viewed by an ordinary consumer as being scientific, and the phrase “verification” is in close proximity to a picture of an fMRI scanner and fMRI brain scan images on the website.¹⁶⁵ No Lie MRI presumably attempts to qualify this statement by claiming that their accuracy is over ninety percent effective and that it will soon be ninety-nine percent effective.¹⁶⁶ However, as discussed earlier, if a claim is subject to two interpretations, one of which is misleading, and another that is not, the advertisement will still be found to be deceptive as long as it is likely to deceive.¹⁶⁷

Furthermore, it is not likely that either company can substantiate a claim of ninety percent accuracy. Though researchers have reported the ability to detect deception in the laboratory setting with a ninety percent accuracy rate, the individuals tested are often small groups of undergraduate college students.¹⁶⁸ There do not appear to be studies on the general population,¹⁶⁹ or on individuals whose behavior has been associated with morphological changes in brain structure, such as recovering alcoholics or drug addicts.¹⁷⁰ In fact, it is unclear whether the studies’ results can be said to apply to older individuals who have normal age-related changes in brain morphology. Without broader studies in hand, it appears difficult, if not impossible, for either

index.php#lie (last visited Dec. 4, 2010).

¹⁶⁵ See Appendix 3.

¹⁶⁶ *Product Overview*, NO LIE MRI, <http://noliemri.com/products/Overview.htm> (last visited Nov. 26, 2010).

¹⁶⁷ *In re Rodale Press, Inc.*, 71 F.T.C. 1184, 1237-38 (1967).

¹⁶⁸ Daniel D. Langleben, *Telling Truth From Lie in Individual Subjects With Fast Event-Related fMRI*, 26 HUMAN BRAIN MAPPING 262, 263 (2005).

¹⁶⁹ See S.K.Z. Ihnen et al., *Lack of Generalizability of Sex Differences in the fMRI BOLD Activity Associated with Language Processing in Adults*, 45 NEUROIMAGE 1020, 1031 (2009) (“Thus from both a cognitive neuroscience perspective and from the standpoint of experimental design, it is important to recognize the possibility that sex differences may exist in functional neuroimaging studies of language and other cognitive domains. It is equally important, however, to recognize that conclusions about between-group differences in fMRI studies should be made conservatively, acknowledging the possibility that accounted variability may contaminate the data.”).

¹⁷⁰ Thomas Wobrock et al., *Effects of Abstinence on Brain Morphology in Alcoholism*, 259 EUR. ARCHIVES OF PSYCHIATRY AND CLINICAL NEUROSCIENCE 143 (2009) (“In conclusion this study confirms the hypothesis that alcoholism causes brain damages that are partially reversible. It should be analyzed in further studies with larger sample sizes, if complete brain regeneration is possible maintaining abstinence over a longer period.”).

company to substantiate the general non-disclaimed representation that they can verify truth.

An argument can also be proffered that a claim to verify truth violates the falsity theory given our current understanding of how the brain functions. Current neuroscience research leads to the conclusion that a simple verification of truth is impossible given that scientists have not found any “deception” neuron whose activity (or lack thereof) would be observable by an fMRI scanner. Furthermore, neuroscience demonstrates that the brain is remarkably “plastic,” that is, it is capable of adaptive structural changes in response to external factors or disease,¹⁷¹ as well as the capacity to co-opt other parts of the brain if necessary. For example, studies have shown that in blind individuals, areas of the visual cortex that are typically believed to deal with sight are in fact activated when those individuals read Braille.¹⁷² This plasticity introduces unpredictability and dynamism in the functional roles of the parts of an individual’s brain.

There is no mention by No Lie MRI or Cephos on their respective websites that they take into account this plasticity. Without evidence that they have taken these characteristics of human brain function into account, the companies’ ability to claim “truth verification” is severely undermined. At the very least, both companies should discuss why these characteristics of the human brain do not play a role in the “truth verification” process. Without such a discussion, both companies would likely lose an FTC challenge under the “reasonable basis” test described *supra*.¹⁷³ That is, the FTC would find the advertising of fMRI lie detection to be deceptive, as it did in *Firestone*, if the companies do not provide a reasonable basis for their truth verification claims.

C. Claim That Professionals Support fMRI as a Lie Detector Are Unsubstantiated

Both companies make express claims that their scans can be used

¹⁷¹ See J.D. Bremmer et al., *Structural and Functional Plasticity of the Human Brain in Posttraumatic Stress Disorder*, 167 *PROGRESS IN BRAIN RES.* 171 (2007).

¹⁷² N. Sadato et al., *Activation of the Primary Visual Cortex by Braille Reading in Blind Subjects*, 380 *NATURE* 526, 526 (1996) (functional neuroimaging study demonstrating activation of the visual cortex in blind individuals while reading Braille).

¹⁷³ See *supra* Part IV.B.7.

in court. Cephos specifically draws on the case of *Roper v. Simmons*¹⁷⁴ in its “The Technology Behind Lie Detects” section, describing that “[t]he U.S. Supreme Court has used fMRIs to help determine when a criminal is a juvenile versus an adult.”¹⁷⁵ On their “Admissibility” page they go on to state that:

The U.S. Supreme Court has received at least one amicus brief based in part on brain scans in *Roper v. Simmons* to aid in the determination of when a person may be tried as an adult. Therefore, the Supreme Court and neuroscientists have supported the use of fMRI in real-world settings.¹⁷⁶

It is clear that Cephos is making a representation that compares its fMRI lie detection technology to the use of fMRI technology in the studies submitted in *Roper*. The amicus brief submitted by the American Psychological Association (hereinafter “APA”) did not, however, claim that adolescents were having specific brain states based on fMRI evidence. Rather, it focused on the morphological changes in the adolescent’s brain as the adolescent develops.¹⁷⁷ Cephos’ statement is misleading as it clearly implies that, since the APA supported the use of fMRI evidence as a mitigating factor in *Roper*, it necessarily supports the use of fMRI technology for lie detection. As described above, the FTC requires that an advertiser claiming that a scientific consensus exists be able to substantiate that claim.¹⁷⁸ Thus, the FTC will have a strong argument against Cephos if it requests substantiation of the claims that a scientific consensus exists on the use of fMRI evidence.¹⁷⁹

The likely failure of either company to substantiate the claims of scientific consensus is underscored after taking into account what the scientists who conducted the actual studies on fMRI-based lie detection have said regarding the application of their findings. Writing in the

¹⁷⁴ *Roper v. Simmons*, 543 U.S. 551 (2005).

¹⁷⁵ *The Technology Behind Lie Detection*, CEPHOS CORP., <http://www.cephoscorp.com/lie-detection/index.php#lie> (last visited Nov. 26, 2010).

¹⁷⁶ *fMRI Testing & Legal Admissibility*, CEPHOS CORP., <http://www.cephoscorp.com/lie-detection/index.php#admissibility> (last visited Nov. 26, 2010).

¹⁷⁷ Brief for Am. Psychological Ass’n et al., as Amici Curiae Supporting Respondent 2-3, *Roper v. Simmons*, 543 U.S. 551 (2003) (No. 03-633).

¹⁷⁸ See *supra* Part IV.B.7 (discussing F.T.C.’s Substantiation Policy).

¹⁷⁹ Additionally, the logic that Cephos utilizes is inherently flawed. Simply because the Supreme Court received an amicus brief from the APA does not therefore mean that the Court supports the use of fMRI for lie detection. In fact, the Court did not mention fMRI once in its opinion. See generally *Roper v. Simmons*, 543 U.S. 551 (2005).

Journal of Behavioral Neuroscience, Dr. Andrew Kozel stated that his fMRI-based study on deception “. . . was designed to identify brain regions associated with deceptive answers versus truthful answers, not to formally test the method as a means of lie detection. Subsequent work will be needed to determine whether this technology can be used to distinguish deceptive responses from truthful responses within individuals.”¹⁸⁰ Furthermore, Dr. Daniel Langleben, the researcher whose patent was purchased by No Lie MRI, has also expressed skepticism, distinguishing between “. . . the researchers of deception and the merchants of fMRI-based lie detection. While the overwhelming majority of the former are recognized scientists, it would be interesting to know more about the latter.”¹⁸¹ These statements from the very researchers who studied the neural correlates of deception will make it difficult for a company such as Cephos or No Lie MRI to demonstrate that it has a reasonable basis for representing that a scientific consensus exists regarding the application of fMRI-based lie detection outside of the academic setting.¹⁸²

Because both companies make such direct claims regarding the scientific community’s support of fMRI-based lie detection, the claims will likely be considered express claims insofar as the Deception Statement standard is concerned.¹⁸³ Furthermore, because the support of the scientific community speaks to the purpose or efficacy of the services advertised, they will all be presumed to be material. The next step is to determine if the claims satisfy the third requirement of the Deception Statement, i.e., whether the statements would mislead a reasonable consumer. This determination is accomplished by analyzing whether the claims made by the companies violate the FTC’s policy as described in its statement on advertising substantiation.

¹⁸⁰ Frank Andrew Kozel et al., *A Replication Study of the Neural Correlates of Deception*, 118 BEHAVIORAL NEUROSCIENCE 852, 855 (2004).

¹⁸¹ D. Langleben & F. Dattilo, Commentary, *The Future of Forensic Functional Brain Imaging*, 36 J. AM. ACAD. PSYCHIATRY L. 502, 502-03 (2008).

¹⁸² Interestingly, Cephos claims that Dr. Kozel may be available for expert testimony on behalf of the subject. *The fMRI Testing Process*, CEPHOS CORP., <http://www.cephoscorp.com/lie-detection/index.php#testing> (last visited Nov. 26, 2010).

¹⁸³ See *supra* Part IV.B.2.

D. Claims That fMRI Readings Can be Used in Court Are Contradicted by Recent Court Decisions

The companies' claim that fMRI findings may be used in court proceedings also violates the FTC Act. As mentioned previously, both companies assert that their scans can be used as evidence.¹⁸⁴ Because these claims concern the efficacy of what they are selling, they will be deemed material.¹⁸⁵ Thus, the remaining question will be whether their claims are likely to deceive. The FTC will have a strong argument that such claims are deceptive under a reasonable basis theory.¹⁸⁶ Under that approach, the FTC could argue that both companies do not have a reasonable basis upon which to base their claims that fMRI-based lie detection is currently admissible in court.

The FTC could support this argument by showing that fMRI findings are unable to pass either of the two tests that are used to determine the admissibility of scientific evidence: the *Daubert* and *Frye* tests. Federal courts, and some state courts, use the *Daubert* test to determine whether scientific evidence should be admissible, whereas other states, including California, New York, and New Jersey, use the traditional *Frye* test.¹⁸⁷ Recent cases demonstrate that the FTC could prevail under either test.

The *Daubert* test was formulated by the Supreme Court in *Daubert v. Merrell Dow Pharmaceuticals* to determine whether scientific evidence was sufficiently reliable to satisfy the Federal Rules of Evidence – most notably Rule 702 which governs testimony by experts.¹⁸⁸ When evaluating scientific evidence under the *Daubert* test, a judge should consider what have come to be known as the *Daubert* factors, namely:

1. Whether the theory or technique can be tested and has been subject to testing
2. Whether the theory or technique has been subject to peer review and publication
3. The known or potential error rate of the methods used and

¹⁸⁴ See *supra* Part V.B.

¹⁸⁵ See *supra* Part V.A.

¹⁸⁶ See *supra* Part IV.B.7

¹⁸⁷ See Maxine D. Goodman, *A Hedgehog on the Witness Stand – What's the Big Idea?: The Challenges of Using Daubert to Assess Social Science and Nonscientific Testimony*, 59 AM. U. L. REV. 635, 683 n. 36 (2010).

¹⁸⁸ *Daubert v. Merrell Dow Pharms.*, 509 U.S. 579, 592 (1993).

the existence of standards controlling the operation of the technique; and

4. Whether the method or theory has been generally accepted by the scientific community.¹⁸⁹

In *United States v. Semrau*, a U.S. Magistrate Judge in Tennessee took issue with the last two factors in a case involving fMRI evidence.¹⁹⁰ Here, the defendant physician owned corporations that contracted with psychiatrists to provide mental health services to patients in nursing homes.¹⁹¹ The United States charged Dr. Semrau with engaging in a scheme to defraud Medicare, Medicaid, and other benefit programs by submitting false and fraudulent claims.¹⁹² The Court held a *Daubert* hearing after the government moved to exclude the expert testimony of Dr. Steven Laken, President and CEO of Cephos, who intended to testify for the defense on the findings of Dr. Semrau's fMRI study conducted by Cephos.¹⁹³

With respect to the third *Daubert* factor — that the operation of the technique has a known or potential error rate as well as the existence of standards surrounding the technique's use — the court found fMRI-based lie detection deficient.¹⁹⁴ The court opined that there presently exists no “real life” error rate for fMRI-based lie detection outside of the laboratory setting.¹⁹⁵ On the second part of the third factor, concerning the existence and maintenance of standards, the court concluded that no such standards exist, notwithstanding the fact that Dr. Laken of Cephos testified as to the protocols and standards that he uses for his own exams.¹⁹⁶ Without any “real life” error rates or any standards governing fMRI-based lie detection, the court held that the fMRI evidence failed the third *Daubert* prong.¹⁹⁷ The court also found that fMRI-based lie detection failed the fourth prong.¹⁹⁸ Citing a string of expert opinions on the inapplicability of fMRI-based lie detection to

¹⁸⁹ *Id.* at 593-94.

¹⁹⁰ *United States v. Semrau*, No. 07-10074 M1/P (W.D. Tenn. May 31, 2010).

¹⁹¹ *Id.* at 3.

¹⁹² *Id.* at 4.

¹⁹³ *Id.* at 1.

¹⁹⁴ *Id.* at 32.

¹⁹⁵ *Id.* at 27.

¹⁹⁶ *Semrau*, No. 07-10074 M1/P, at 31.

¹⁹⁷ *Id.* at 32.

¹⁹⁸ *Id.*

real-world lie detection, the court concluded that the technology has not garnered general acceptance in the scientific community.¹⁹⁹ Accordingly, the magistrate recommended exclusion of this testimonial evidence.

The FTC could also successfully argue that the companies have no reasonable basis for a claim of admissibility in jurisdictions that apply the *Frye* test. The *Frye* test arose from *United States v. Frye*, a 1923 decision concerning whether measures of blood pressure could be admitted as proof of deception.²⁰⁰ The *Frye* test stands for the proposition that scientific evidence is inadmissible unless the technique is “generally accepted” as reliable in the relevant scientific community.²⁰¹

In *Wilson v Corestaff Services*,²⁰² a New York state court, upon a motion *in limine*, opined that current fMRI data fails *Frye*’s “general acceptance” test.²⁰³ In *Wilson*, the plaintiff sought to introduce fMRI-based lie detection evidence in order to bolster the credibility of a key witness in her case against a staffing agency.²⁰⁴ In addition to the doubts that the court expressed about admitting expert testimony to bolster the credibility of a fact witness, it nevertheless found that such evidence fails the *Frye* test.²⁰⁵ The court stated that “even a cursory review of the scientific literature demonstrates that the plaintiff is unable to establish that the use of the fMRI test to determine truthfulness or deceit is accepted as reliable in the scientific community.”²⁰⁶

In light of both *Semrau* and *Wilson*, No Lie MRI and Cephos lack a reasonable basis for their claims that the fMRI studies they conduct are admissible in court. Until fMRI-based lie detection findings are admitted, the continued claims of legal admissibility by both companies should be considered a deceptive practice under the FTC Act.

E. Claims of Computer Automation are Deceptive

As discussed in Part V.C, both companies claim that humans do

¹⁹⁹ *Id.*

²⁰⁰ *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923).

²⁰¹ *Id.* at 1014.

²⁰² *Wilson v Corestaff Servs. L.P.*, 900 N.Y.S. 2d 639, 639 (N.Y. Sup. Ct. 2010).

²⁰³ *Id.* at 642.

²⁰⁴ *Id.* at 640.

²⁰⁵ *Id.* at 641-42.

²⁰⁶ *Id.* at 642.

not interpret their scans, but are instead analyzed by computers. The FTC can challenge these claims under either the falsity theory or the substantiation requirement. With respect to a challenge under the falsity theory, the FTC could prove that, at some level, a human being must program the fMRI's computer software to interpret a certain BOLD threshold of activity as a trigger to a finding of "deception." This is precisely what must be done when creating the hemodynamic models that interpret the fMRI data.²⁰⁷ This determination is critical given that one threshold level will produce an fMRI image that shows activation (i.e. a colored region of the scan) whereas a different threshold may not. Under the reasonableness theory, the FTC could also request that the companies substantiate their claim that no human determination of what constitutes a lie is used. Because of the inherent human interaction in setting the BOLD threshold activity, the FTC is likely to prevail under either theory.

VII. THE FTC SHOULD SEEK TO "FENCE-IN" FMRI LIE DETECTION COMPANIES

Since it is likely that various claims of No Lie MRI and Cephos violate deceptive trade practice laws, the next question that must be answered is how the FTC should seek to remedy the situation. Considering the fact that both companies market their services to individuals, lawyers, corporations, and the government, the remedy provided should be strong enough to prevent the deception of such marketing to each of those consumer groups. A serious restriction on such marketing is also warranted because the truth of the claims made by these companies can not be readily determined by the consumers, a fact that the FTC has previously used as a reason to impose serious marketing restrictions on violators.²⁰⁸

Section 5(b) of the FTC Act authorizes the FTC to issue cease and desist orders that prohibit a continuation of any practices found to be deceptive.²⁰⁹ These requirements can go beyond prohibiting the precise

²⁰⁷ See *supra* Part VI.A (discussing hemodynamic modeling).

²⁰⁸ See *In re* Thompson Medical Corp., 102 F.T.C. 648, 834 (1984) (discussing how the seriousness of the violation is affected by the consumers' ability to judge the truth or falsity of the claims, which was compounded here by Thompson's deliberateness in making such statements).

²⁰⁹ 15 U.S.C. § 45(b) (2010). See generally *F.T.C. v. Mandel Bros.*, 359 U.S. 385, 392-93 (1959).

conduct at issue, and can “fence in” the company from engaging in similar kinds of deceptive advertising.²¹⁰ The principal factor for a court reviewing a fencing-in order is whether the order bears a “reasonable relation to the unlawful practices found to exist.”²¹¹ In a recent decision, the FTC more specifically noted three factors that it will look at in examining a fencing in order, including “(1) the seriousness and deliberateness of the violation; (2) the ease with which the violation may be transferred to other products; and (3) whether the respondent has a history of prior violations.”²¹² FTC orders are not typically limited to any particular product of a company but rather cover a specific category or the entirety of products marketed by a company.²¹³

All three factors here warrant a fencing-in requirement. With respect to the first factor, marketing fMRI-based lie detection in its infant stage would be considered serious, as the marketing targets a wide swath of the population, including individuals, corporations, as well as the federal government. Moreover, the marketing by No Lie MRI and Cephos continues even in the face of mounting evidence and opinion that the technology is not ready for “prime time.”

Furthermore, the second factor is satisfied. Undoubtedly, both companies will attempt to continue marketing their devices as newer fMRI machines are created. However, as discussed previously, an increase in, for example, the power of the fMRI machine, will not necessarily cure many of its fatal flaws. Though neither company necessarily has a history of violations at this point, the companies’ continued marketing of the products, as well as their media appearances promoting their products, clearly tip the scale in terms of a strong fencing-in requirement.

A fencing-in requirement would have to consist of a number of provisions. Specifically, it would have to:

²¹⁰ *Mandel Bros.*, 359 U.S. at 392-93 (“One cannot generalize as to the proper scope of these orders. It depends on the facts of each case and a judgment as to the extent to which a particular violator should be fenced in...Where the episodes of misbranding have been so extensive and so substantial in number as they were here, we think it permissible for the Commission to conclude that like and related acts of misbranding should also be enjoined as a prophylactic and preventive measure.”).

²¹¹ *Jacob Siegel Co. v. F.T.C.*, 327 U.S. 608, 612-113 (1946).

²¹² *In re Telebrands*, 140 F.T.C. 278, 334 (2005).

²¹³ *See F.T.C. v. Colgate-Palmolive Co.*, 380 U.S. 374, 394-95 (1965) (“[W]e find no defect in the provision of the order which prohibits respondents from engaging in similar practices with respect to ‘any product’ they advertise. . .”).

1. Prohibit both companies from using the phrase “verification” in reference to their fMRI services;
2. Prohibit any representations that claim an absence of human interaction or interpretation in the process of determining deception;
3. Prohibit any representations that the scientific community has formed a consensus in favor of using fMRI-based lie detection.

These fencing-in provisions would allow the companies to continue to offer the services, but would prevent them from marketing it in a way that overstates their efficacy and acceptance in the scientific community.

CONCLUSION

fMRI research yields extraordinary insight into what is arguably the most complex system known to man: the human brain. However, the powerful potential of fMRI to uncover our mental states is not without concomitant tensions. Constitutional rights prohibiting self-incrimination and unwarranted search and seizure, issues pertaining to privacy, as well as the potential application of fMRI lie detection by the government for national security purposes, require us to be vigilant and skeptical of the commercialization of fMRI technology. Unfortunately, such commercialization is beginning to obtain a critical mass. Both No Lie MRI and Cephos currently market to what amounts to the entire U.S. population: individuals, corporations, lawyers and the state and federal government.²¹⁴ The development and commercialization of this powerful technology has been followed by extraordinary media coverage which has fostered a popular notion that fMRI technology can “read your mind.”²¹⁵ Both No Lie MRI and Cephos have leveraged this popular notion of fMRI as a mind-reading device. However, the science is simply not at the stage where fMRI lie detection should be marketed as “truth verification.”

Marketing fMRI as such is both deceptive and dangerous, and it is precisely the role of the FTC to prevent deceptive marketing of fMRI.

²¹⁴ See CEPHOS CORP., *supra* note 6; NO LIE MRI, *supra* note 6.

²¹⁵ See, e.g., Brooke Borel, *Mind-Reading Tech May Not Be Far Off*, POPULAR SCI. (June 12, 2009, 4:15 PM), <http://www.popsci.com/scitech/article/2009-06/mind-reading-tech-way>; *60 Minutes*; *Reading Your Mind* (CBS television broadcast Jan. 4, 2009).

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There are persuasive arguments as to why fMRI technology has powerful *potential* as a lie detector while others would argue that lie detection via fMRI is probably impossible. Because the potential for fMRI as a lie detector exists, and because of the immensely positive applications that such technology would have, the FTC should not seek to eliminate No Lie MRI and Cephos from advertising fMRI-based lie detection. Rather, the FTC should recognize that both companies are in violation of deceptive trade practices, and should require them to advertise the technology within the bounds of the current state of the art.

VIII.APPENDIX I²¹⁶

The below images are from Daniel Langleben's study which required subjects to lie about the card they were holding.

²¹⁶ Langleben, *supra* note 44.

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IX. APPENDIX 2²¹⁷

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²¹⁷ FRACKOWIAK, *supra* note 157, at 601.

²¹⁸ NO LIE MRI, *supra* note 6.

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XI. APPENDIX 4