
Article

Neuromarks

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INTRODUCTION

Neuroscience is changing the law. Between 2007 and 2012, the number of judicial opinions mentioning neuroscientific evidence more than doubled.¹ Brain imaging is now part of the evidentiary record on “everything from competence to waive Miranda rights, subjective experience of pain in tort cases, custody determinations, mens rea defenses for fraud, kidnapping, burglary, and even murder.”² This evidence can decide the weightiest of legal matters. Scans have been used to reveal brain abnormalities that could explain past behavior and, hence, be used to determine whether a defendant deserves the death penalty.³

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1. Nita A. Farahany, *Neuroscience and Behavioral Genetics in U.S. Criminal Law: An Empirical Analysis*, 2 J.L. & BIOSCIENCES 485, 486 (2015); see also Robbie Gonzalez, *How Criminal Courts Are Putting Brains—Not People—On Trial*, WIRED (Dec. 4, 2017), <http://www.wired.com/story/how-criminal-courts-are-putting-brains-not-people-on-trial> (“[L]awyers are introducing so-called neurobiological evidence into court more than ever.”).

2. Teneille Brown & Emily Murphy, *Through a Scanner Darkly: Functional Neuroimaging as Evidence of a Criminal Defendant’s Past Mental States*, 62 STAN. L. REV. 1119, 1132 (2010).

3. Deborah W. Denno, *The Myth of the Double-Edged Sword: An Empirical Study of Neuroscience Evidence in Criminal Cases*, 56 B.C. L. REV. 493, 494–99 (2015) (citing the use of brain scans revealing frontal lobe damage as mitigation in a death penalty-eligible case).

Not surprisingly, a growing legal literature debates the proper role of neuroscientific evidence in the law.⁴ Criminal law scholars argue over not just the admissibility of such evidence, but its implications for punishment in the future.⁵ Yet outside of criminal law, analysis of neuroscientific evidence in the courtroom has been lacking.⁶

This is surprising given the arena where most of the applied research into brain function is taking place. Market research, not studies of criminal defendants' grey matter, is where the money is and is the focus of much neuroscientific study. Advertisers already deploy neuroscientific insights into better branding strategies.⁷ Blue-chip companies that have used neural know-how to design advertising campaigns include Volvo, Hyundai, Campbell's, and Jack Daniel's.⁸ Most large advertising agen-

4. Francis X. Shen, *The Law and Neuroscience Bibliography: Navigating the Emerging Field of Neurolaw*, 38 INT'L J. LEGAL INFO. 352, 352 (2010) (describing "extraordinary growth in the amount of legal scholarship . . . at the intersection of law and neuroscience").

5. See Donald Braman et al., *Some Realism About Punishment Naturalism*, 77 U. CHI. L. REV. 1531, 1595–96 (2010) (suggesting that neuroscience will effect a rejection of free will in legal theory and thereby retributivism); Jane Campbell Moriarty, *Seeing Voices: Potential Neuroscience Contributions to a Reconstruction of Legal Insanity*, 85 FORDHAM L. REV. 599, 603–04 (2016) (proposing that neuroscience will further legal understanding of the relationship between thought and behavior, and moral blameworthiness); Stephen J. Morse, *Criminal Responsibility and the Disappearing Person*, 28 CARDOZO L. REV. 2545, 2570–75 (2007) (arguing materialism cannot entirely erase moralism); O. Carter Snead, *Neuroimaging and the "Complexity" of Capital Punishment*, 82 N.Y.U. L. REV. 1265, 1319–24 (2007) (discussing mitigating neurological evidence in Supreme Court jurisprudence).

6. See Francis X. Shen, *Law and Neuroscience 2.0*, 48 ARIZ. ST. L.J. 1043, 1043 (2016) ("Neurolaw too often focuses only on criminal responsibility."). There are a few exceptions. See, e.g., Harvey L. Fiser & Patrick D. Hopkins, *Getting Inside the Employee's Head: Neuroscience, Negligent Employment Liability, and the Push and Pull for New Technology*, 23 B.U. J. SCI. & TECH. L. 44 (2017) (neuroscience and employment law); Erez Reuveni, *Copyright, Neuroscience, and Creativity*, 64 ALA. L. REV. 735 (2013) (neuroscience and copyright law); Andrew W. Torrance, *Neurobiology and Patenting Thought*, 50 IDEA 27 (2009) (neuroscience and patent law).

7. In 2013, global market research spending on neuromarketing hit \$330 million. This number is only expected to increase. BCC Research, *Neuromarketing Maturing as Research Firms Seek to Leverage Its Advantages*, MARKETWIRED (July 11, 2016), <http://www.marketwired.com/press-release/neuromarketing-maturing-as-research-firms-seek-leverage-its-advantages-reports-bcc-research-2141037.htm>.

8. Roger Dooley, *Neuromarketing: Pseudoscience No More*, FORBES (Feb. 24, 2015), <http://www.forbes.com/sites/rogerdooley/2015/02/24/neuromarketing-temple/#35b2d33dde94>.

cies and market research firms now have neuromarketing divisions.⁹ Thanks to this emphasis on learning about shoppers' minds, our understanding of consumer thought can only improve in the years to come.

What if we could know exactly what consumers are thinking? Advertisers have always wanted this information to make their commercial pitches more effective. But judges have also long been in search of a holy grail of perfect consumer understanding. Estimates of consumer thought form the bulk of trademark doctrine. A series of common law rules channel judicial intuition about (1) when potential purchasers are likely to view a word or symbol as indicating the source of goods; and (2) when these purchasers are likely to be confused by the actions of another party.¹⁰ Similarly, a federal statutory cause of action for trademark dilution asks courts to intuit when non-confusing uses of another party's trademark somehow blur or tarnish the signaling power of that trademark inside consumers' heads.¹¹

The problem is that even if judges could somehow root out their own biases and cognitive flaws, it is impossible to know exactly what the consumer is thinking. Judges themselves recognize this. In the 1940s, Judge Jerome Frank longed to replace the common law's "shaky kind of guess" as to trademark confusion with something that better reflected actual consumer sentiment.¹² Judge Richard Posner acknowledged that judges have their own "blind spots" when trying to understand consumer behavior.¹³

9. Hilke Plassmann et al., *Consumer Neuroscience: Applications, Challenges, and Possible Solutions*, 52 J. MARKETING RES. 427, 427 (2015).

10. See *infra* Part II.D.

11. 15 U.S.C. § 1125(c) (2012). A classic example is the hypothetical case of "Buick aspirin." Under dilution theory, although consumers would not believe that the car brand had entered the pain relief business, such an unauthorized use might somehow diminish the original source-identifying power of the BUICK trademark. See Federal Trademark Dilution Act of 1995, H.R. REP. NO. 104-374, at 2-3, *as reprinted in* 1996 U.S.C.C.A.N. 1029, 1029-30 (offering BUICK aspirin, DUPONT shoes, and KODAK pianos as examples of unauthorized uses of famous trademarks that would lead to trademark dilution).

12. *Triangle Publ'ns, Inc. v. Rohrlich*, 167 F.2d 969, 976 (2d Cir. 1948). Frank went so far as to question a group of "adolescent girls and their mothers and sisters, persons I have chosen at random" to determine whether actual consumers would confuse plaintiff's SEVENTEEN for magazines with defendant's MISS SEVENTEEN for girdles. Frank admitted that "my method of obtaining such data is not satisfactory," but thought it preferable to deciding the issue without consulting anyone of the relevant purchasing class: teenage girls. *Id.*

13. *Kraft Foods Grp. Brands LLC v. Cracker Barrel Old Country Store, Inc.*, 735 F.3d 735, 741 (7th Cir. 2013) (commenting that "judges and jurors have

Trademark law scholars sing the same lament, longing for more accurate measures of the consuming mind.¹⁴ Some contend that the rules of thumb for evaluating whether a word or symbol should be eligible for trademark protection fail to track consumer thought.¹⁵ Others suggest that judges are bad at assessing audience confusion.¹⁶ Whatever the source of the problem, protecting words that do not actually communicate source and failing to protect words that do prohibits innocuous trademark uses, thereby harming free expression and competition while doing nothing to advance consumer interests.

For its proponents, consumer neuroscience holds the potential for replacing flawed judicial intuition with precise measurements of consumer thought.¹⁷ Consider a recent study where functional magnetic resonance imaging (fMRI) was used to

their own biases and blind spots” in assessing the likelihood of consumer confusion).

14. See, e.g., Rebecca Tushnet, *What’s the Harm of Trademark Infringement?*, 49 AKRON L. REV. 627, 646 (2016) (“As long as trademark purports to be guided by consumer reactions, it can only benefit from a better understanding of those reactions.”).

15. See, e.g., Jake Linford, *Are Trademarks Ever Fanciful?*, 105 GEO. L.J. 731, 734–36 (2017) (examining trademark analysis in light of sound symbolism); Lisa Larrimore Ouellette, *The Google Shortcut to Trademark Law*, 102 CALIF. L. REV. 351, 359–62 (2014) (arguing that trademark distinctiveness doctrine is “largely unsuccessful”); Alexandra J. Roberts, *How to Do Things with Word Marks: A Speech-Act Theory of Distinctiveness*, 65 ALA. L. REV. 1035, 1039 (2014) (describing the harm resulting from the failure of distinctiveness tests); Rebecca Tushnet, *Looking at the Lanham Act: Images in Trademark and Advertising Law*, 48 HOUS. L. REV. 861, 871–74 (2011) (criticizing the disconnect between legal doctrine and marketing knowledge).

16. See Robert G. Bone, *Taking the Confusion Out of “Likelihood of Confusion”: Toward a More Sensible Approach to Trademark Infringement*, 106 NW. U. L. REV. 1307, 1308–09 (2012) (“[T]rademark owners exploit [the likelihood of confusion test’s] uncertainty and the high cost of litigation it generates.”); Mark A. Lemley & Mark McKenna, *Irrelevant Confusion*, 62 STAN. L. REV. 413, 427 (2010) (criticizing an overinclusive assessment of consumer confusion); see also Jeanne C. Fromer & Mark A. Lemley, *The Audience in Intellectual Property Infringement*, 112 MICH. L. REV. 1251, 1260 (2014) (noting “systematic ways in which the jury’s perspective is likely to diverge from that of actual consumers” in trademark infringement cases).

17. Moran Cerf et al., *Using Single-Neuron Recording in Marketing: Opportunities, Challenges, and an Application to Fear Enhancement in Communications*, 52 J. MARKETING RES. 530, 534 (2015) (touting consumer neuroscience’s future capability for determining brand confusion); Vinod Venkatraman et al., *New Scanner Data for Brand Marketers: How Neuroscience Can Help Better Understand Differences in Brand Preferences*, 22 J. CONSUMER PSYCHOL. 143, 149 (2012) (discussing how brain imaging can let advertisers “detect distinct emotional states and their corresponding distinct decision-making processes”).

measure changes in brain blood flow and oxygenation while research subjects viewed several well-known trademarks.¹⁸ Afterwards, the study's participants completed a widely-used market research survey designed to assess each brand's personality traits.¹⁹ On the basis of these two data sets, the researchers claimed the ability to decode "the representational space of brand personality in the brain," successfully predicting the brain activity of consumers viewing other trademarks like DISNEY or GUCCI.²⁰ According to the researchers, each brand has a different neural signature, with different brain regions reflecting perceptions like "excitement," "ruggedness," or "sophistication" upon exposure to the brand stimulus.²¹ By viewing these neural signatures, researchers could distinguish whether the subject was thinking about APPLE or MICROSOFT, COKE or PEPSI.²²

Studies like this hint at a future where fMRI readings replace judicial guesswork about consumer perception. At some point, businesses may try to offer a neural map unique to each well-known brand—a "neuromark"—into evidence. This neuromark would reveal not just whether consumers are familiar with a trademark, but how they actually feel about it. The neuromark promises a biological baseline for the basic questions at the heart of trademark law, telling courts how a mark is perceived and whether a defendant's activities will interfere with those perceptions.

This is not to say that neuroscientists currently have the ability to peer into consumers' heads and determine when a mark signals source to an audience, or when another party's use of that mark will confuse consumers or alter the mark's reputation. The neuromark is an aspirational goal, not a present reality. In an important and prescient article written ten years ago, Rebecca Tushnet demonstrated that psychological studies of the time did not justify actions for trademark dilution. Tushnet showed that these studies were unreliable and offer little evidence of actual harm to famous mark owners.²³ "In a complex,

18. Yu-Ping Chen et al., *From "Where" to "What": Distributed Representations of Brand Associations in the Human Brain*, 52 J. MARKETING RES. 453, 455 (2015).

19. *Id.*

20. *Id.* at 455–56.

21. *Id.* at 457.

22. *Id.* at 460–61.

23. Rebecca Tushnet, *Gone in Sixty Milliseconds: Trademark Law and Cognitive Science*, 86 TEX. L. REV. 507, 527–46 (2008). The key study Tushnet analyzed, however, did *not* rely on neural imaging. Instead, after being exposed to

dynamic system like that of trademark law,” she cautions, “there are no magic bullets, or magic MRIs.”²⁴

I take Tushnet’s concerns seriously. Researchers have yet to refine their techniques such that every brand’s neural signature will be unique from all others or to show that the biological blueprint uncovered during an fMRI scan would look the same during exposure to a brand in the real-world marketplace. Nevertheless, for two reasons, the implications of brain science for trademark law deserve serious scholarly consideration.

First, scientific understanding of the brain has increased dramatically in the last decade.²⁵ A common early criticism of neuroscience was a tendency among researchers to focus on localized brain functions, ignoring the reality that human thought involves complex neural networks spread across the brain.²⁶ Today, however, researchers routinely track brain activity across many areas.²⁷ As a result, even neuromarketing skeptics acknowledge that “[n]euroscience has much to say about such major phenomena as attention, emotion, and memory that are essential to motivating consumers.”²⁸

Second, even flawed science can sometimes find its way into the courtroom. The history of psychology and law reveals several

supposedly dilutive advertisements, respondents had to hit keys for “yes” or “no” to see how quickly they could determine whether a famous brand presented on a computer screen matched its correct product category (e.g., Godiva chocolates). See Maureen Morrin & Jacob Jacoby, *Trademark Dilution: Empirical Measures for an Elusive Concept*, 19 J. PUB. POL’Y & MARKETING 265 (2000) (finding existence of trademark dilution through memory-based measures).

24. Tushnet, *supra* note 23, at 568.

25. See *infra* Part I.

26. See generally WILLIAM R. UTTAL, THE NEW PHRENOLOGY: THE LIMITS OF LOCALIZING COGNITIVE PROCESSES IN THE BRAIN 4–27 (2001). Neuroscientists also need to be careful not to jump to conclusions or accidentally trumpet false positives given the tremendous amount of data collected and analyzed through modern brain scanning technology. See generally Craig M. Bennett et al., *Neural Correlates of Interspecies Perspective Taking in the Post-Mortem Atlantic Salmon: An Argument for Multiple Comparisons Correction*, 1 J. SERENDIPITOUS & UNEXPECTED RESULTS 1, 1 (2010) (using scans of dead fish that supposedly exhibited brain activity when being exposed to photographs of human subjects to illustrate the need for more correction for chance correlations in fMRI research).

27. See Martha J. Farah, *Brain Images, Babies, and Bathwater: Critiquing Critiques of Functional Neuroimaging*, in INTERPRETING NEUROIMAGES: AN INTRODUCTION TO THE TECHNOLOGY AND ITS LIMITS S19, S21–S23 (Josephine Johnston & Erik Parens eds., 2014) (describing non-localized and non-phrenological methods of neuroimaging analysis).

28. SALLY SATEL & SCOTT O. LILIENFELD, BRAINWASHED: THE SEDUCTIVE APPEAL OF MINDFULNESS NEUROSCIENCE 34 (2013).

instances where supposed advances in the study of the human mind proved grossly inaccurate and triggered significant, sometimes deleterious legal consequences.²⁹ The increasing reliance on neuroscientific evidence in criminal adjudications suggests that courts are already concluding that some brain imaging data meets the tests for scientific reliability. Moreover, because neuroscience is arguably more suited to supply evidence of general consumer sentiment from the aggregation of multiple fMRI scans than to accurately pinpoint a single criminal defendant's mental state, trademark law seems a better candidate for the introduction of fMRI results than criminal law.³⁰ Hence, even if the hype of consumer neuroscience does not currently match the reality, critical analysis is needed to prepare courts for attempts to introduce neuroscience into evidence in trademark cases.

This Article begins to provide that analysis. Part I of the Article describes the current state of the art in consumer neuroscience and its relationship to the legal questions of distinctiveness, likelihood of confusion, and dilution that dominate trademark law. Businesses are bankrolling experiments and technologies meant to reveal the essential ingredients of buying behavior. A key part of this research searches for the neural hallmarks of successful brands.

Part II is predictive. It describes how the estimates of consumer perception that run through trademark law could be altered by neuroscience. One cannot chart a simple story of scientific advancements automatically updating legal thought. It is impossible to forecast with certainty how consumer neuroscience will develop in the years to come and how those developments will shape trademark law. Nevertheless, antecedent collisions between law and psychology offer lessons for how neuroscientific understandings could be incorporated into trademark doctrine. The recent introduction of neuroscientific evidence in criminal

29. See Jed S. Rakoff, *Neuroscience and the Law: Don't Rush In*, N.Y. REV. BOOKS (May 12, 2016), <http://www.nybooks.com/articles/2016/05/12/neuroscience-and-the-law-dont-rush-in>. To take one particularly troubling example, psychologists provided important professional and academic cover for the eugenics movement of the early twentieth century, which in turn influenced the legal profession. The Supreme Court's decision in the 1927 case of *Buck v. Bell*, 274 U.S. 200, not only upheld the constitutionality of a Virginia forced sterilization law, but provided legal blessing for a series of eugenics laws in different states that ultimately resulted in the forced sterilization of between sixty and seventy thousand people. ADAM COHEN, *IMBECILES: THE SUPREME COURT, AMERICAN EUGENICS, AND THE STERILIZATION OF CARRIE BUCK* 8–9, 299–300, 319 (2016); see also *infra* Part II.

30. See *infra* note 88 and accompanying text.

law also suggests likely paths of influence for consumer neuroscience.

Part III erects the normative scaffolding to see which of these paths policymakers and judges should take and which they should avoid. Psychologists recognize two models of consumer reasoning: an automatic, emotional model and a deliberative, cognitive model.³¹ Neuroscience offers a window into both processes, but courts should be wary of evidence purporting to measure non-deliberative changes in mark meaning. Accepting neural proof of shoppers' emotional reactions into evidence could stifle competition and handicap consumers in their efforts to decipher and learn from advertising's affective appeals. An over-eager embrace of consumer neuroscience also risks extending legal protection to marketing innovations the law may want to discourage. Greater understanding of how consumers think changes the rules of the trademark game. It is critical for legislators, judges, and scholars to make sure that they change in the right way.

I. UNDERSTANDING CONSUMERS

By uncovering a brand's neural hallmarks, advertisers can better track the mental bonds between trademarks and consumers. This research not only lends itself to more effective advertising, but also holds the potential for new insights into how human beings perceive and make decisions about commercial symbols, something at the heart of trademark law. After illustrating the centrality of consumer perceptions to trademark law, this Part describes neuroscience's current capabilities in measuring those perceptions.

A. TRADEMARK LAW AND CONSUMER PERCEPTION

Trademark law revolves around judicial assessments of consumer thought. In almost any trademark case, the central question at issue is how consumers are likely to perceive a particular advertising stimulus.

Take, for example, the hypothetical case of a restaurant chain named "Burgatory."³² If the proprietors of this chain seek trademark protection, they will need to demonstrate that their

31. See Shahar Ayal et al., *Deliberative Adjustments of Intuitive Anchors: The Case of Diversification Behavior*, 189 SYNTHESE 131, 133 (2012) (offering a study of the interaction between the two modes of reasoning).

32. Actually, not so hypothetical. See BURGATORY, <http://www.burgatorybar.com> (last visited Sept. 17, 2018).

BURGATORY mark is “distinctive,” i.e., consumers recognize the BURGATORY mark as identifying a source of goods or services.³³ To figure out whether consumers interpret a mark as a source identifier, courts employ tests of their own construction, such as the “imagination test” (asking if the term at issue requires imagination to reach a conclusion as to the nature of the product) or the “double entendre” test (treating marks that employ twofold meanings as automatically distinctive).³⁴ If the mark at issue passes these tests—for example, a court concludes that a consumer requires some imagination to discern that the BURGATORY mark is for a particular hamburger restaurant and, hence, the mark signals source instead of mere product characteristics—then the mark is considered “inherently distinctive”³⁵ and enjoys full trademark rights without any proof of actual consumer sentiment.³⁶

If a mark fails these tests, however, then the mark proponent must provide evidence of “acquired distinctiveness” in the minds of consumers.³⁷ Courts look to circumstantial proof, like the amount of advertising conducted by the mark proponent, the relevant product’s sales volume, and evidence that the defendant knowingly imitated the plaintiff’s symbol, to determine if a mark has acquired distinctiveness.³⁸ The basic question at issue in the acquired distinctiveness analysis is whether consumers have come to associate the mark at issue with a particular source of goods or services. If BURGATORY does not indicate source to consumers, it is considered “merely descriptive” and forfeits trademark protection.³⁹

33. Jake Linford, *The False Dichotomy Between Suggestive and Descriptive Trademarks*, 76 OHIO ST. L.J. 1367, 1375 (2015) (“Trademark law protects the exclusive use of a word only to the extent that the word signifies a singular source for a product.”).

34. *Zobmondo Entm’t. v. Falls Media, LLC*, 602 F.3d 1108, 1115–17 (9th Cir. 2010) (applying the imagination test); *Zurco, Inc. v. Sloan Valve Co.*, 785 F. Supp. 2d 476, 491 (W.D. Pa. 2011) (applying the double entendre test).

35. *Two Pesos, Inc. v. Taco Cabana, Inc.*, 505 U.S. 763, 763 (1992) (defining inherently distinctive as “not merely descriptive”).

36. The imagination test is the most commonly used method for determining when a mark is inherently distinctive. 2 J. THOMAS MCCARTHY, MCCARTHY ON TRADEMARKS AND UNFAIR COMPETITION § 11:67 (5th ed. 2018).

37. See *Zobmondo*, 602 F.3d at 1113 (also referring to acquired distinctiveness as “secondary meaning”).

38. MCCARTHY, *supra* note 36, § 15:38.

39. Similarly, marks deemed “generic” cannot be protected at all, even if there is evidence of acquired distinctiveness. Generic terms “depict a genus or type of product, rather than a particular product.” *Murphy Door Bed Co. v. In-*

If Burgatory's owners convince a court that they own a distinctive mark, they can potentially sue others for trademark infringement. Let's say that the Burgatory folks object to a new restaurant that styles itself "Burger Story," worrying that burger purchasers will confuse the new restaurant with their own. Again, the court must estimate consumer perception, this time asking whether customers will mistake the defendant's trademark for the plaintiff's. All of the federal circuit courts of appeal rely on a multi-factor test to answer this question. Although the number and nature of the factors differ from circuit to circuit, there is a consensus that the following factors must be part of the consumer confusion analysis:

- Similarity of the plaintiff's and defendant's marks
- "Strength" of the plaintiff's mark
- Intent of the defendant
- Purchaser sophistication
- Presence of actual confusion
- Relatedness of the goods or services at issue⁴⁰

As these factors make clear, judges assess likelihood of confusion through intuition and proxies for consumer sentiment rather than actual testing of that sentiment. Only the actual confusion factor permits direct evidence of consumer thought to enter the analysis—the rest of the infringement analysis is left largely to judicial guesswork.⁴¹

Finally, let's assume that the Burgatory chain enjoys great success, opening up restaurants in all fifty states and becoming well-known to the general public. Then, without authorization,

terior Sleep Sys., 874 F.2d 95, 100 (2d Cir. 1989). As with the line between inherent and acquired distinctiveness, proxies for direct evidence of consumer thought—use of the proposed mark by competitors and use by the media—help decide whether a mark is "descriptive" and potentially eligible for protection or "generic" and not eligible for protection. *See, e.g.*, *Mil-Mar Shoe Co. v. Shonac Corp.*, 75 F.3d 1153, 1158–61 (7th Cir. 1996).

40. *See* Michael H. Bierman & Jeffrey D. Wexler, *Toward a Reformulation of the Test for Determining Trademark Infringement*, 80 TRADEMARK REP. 1, 4 (1990); *see also* RESTATEMENT (THIRD) OF UNFAIR COMPETITION §§ 21–23 (Am. Law Inst. 1995) (recommending factors to be considered in determining likelihood of confusion).

41. The direct nature of actual confusion evidence causes courts to give this factor great weight in the likelihood of confusion analysis. *See infra* notes 164–65 and accompanying text. Potentially, there could also be direct evidence of consumer reaction at issue for the mark strength factor as well. A large part of mark strength analysis, however, involves the mark's "conceptual strength," which is a study of the inherently source-identifying properties of the mark and not of any on-the-ground consumer reaction to the mark. *See Grayson O Co. v. Agadir Int'l LLC*, 856 F.3d 307, 315–16 (4th Cir. 2017).

a pet food supplier begins selling a dog food mix under the “Burgatory” name. Even if pet owners are not confused into thinking the two companies are related, the restaurant chain may attempt to sue for trademark dilution. A court would need to decide whether exposure to the pet food mark will dim the signaling power of the BURGATORY mark for hamburger restaurants in consumers’ heads. One variety of the dilution cause of action asks if the defendant’s use of the mark somehow harms the reputation of the plaintiff’s mark.⁴² A court evaluating such a claim would need to assess whether consumers are likely to make a mental association between the plaintiff’s and the defendant’s marks and whether that association somehow negatively impacts their estimation of the BURGATORY mark.

As these hypotheticals make clear, judicial estimates of consumer thought dominate trademark law. The problem is that these estimates typically lack empirical grounding.⁴³ The trier of fact needs to channel the mind of the consuming public with little to go on but her own sense of what seems distinctive, confusing, or dilutive. Against this background, it is easy to see the appeal of consumer neuroscience for trademark law. It offers the potential for replacing hunches and indirect evidence with direct neural evidence of consumer perception.

B. EXPLORING THE CONSUMING MIND

Thanks to machines that can reveal neural processes as they happen, researchers now have a ringside seat to the biological mechanisms evident in different kinds of thought processes. fMRI scanners record fluctuations in brain blood flow and oxygenation, thereby revealing which areas of the brain are activated by particular stimuli.⁴⁴ Technologies for detecting the electric and magnetic fields associated with neural activity in the brain—the most important of which is encephalography (EEG)—have been around for years, but have recently become vastly

42. 15 U.S.C. § 1125(c)(2)(C) (2012).

43. The lack of empirical or scientific support for trademark law decisions has been a frequent and longstanding complaint. *See, e.g.*, William E. Gallagher & Ronald C. Goodstein, *Inference Versus Speculation in Trademark Infringement Litigation: Abandoning the Fiction of the Vulcan Mind Meld*, 94 TRADEMARK REP. 1229, 1269–70 (2004); *see also infra* notes 118–22.

44. fMRI has been identified as “the technique of choice for neuromarketing,” though other, even more precise tools for measuring metabolic brain activity exist. Terry Daugherty & Ernest Hoffman, *Neuromarketing: Understanding the Application of Neuroscientific Methods Within Marketing Research*, in ETHICS AND NEUROMARKETING 5, 10 (Andrew R. Thomas et al. eds., 2017).

more valuable thanks to greater processing speeds that can measure the rapid neural changes that mark cognitive and emotional response.⁴⁵ These processing speeds allow researchers to compare shifts in neurological function mere milliseconds apart.⁴⁶ This technology has also become more portable, with wearable EEG devices that soldiers can take on the battlefield⁴⁷ and consumers can don while they shop.⁴⁸

Consumer neuroscience uses these technologies to study “the neural conditions and processes that underlie consumption, their psychological meaning, and their behavioral consequences.”⁴⁹ From the advertiser’s perspective, reliance on neurophysiological data avoids the problems inherent in consumer self-reporting. For a long time, researchers have developed

45. Relatedly, the technologies for determining biometric responses to external stimuli have gotten more sophisticated and, as a result, valuable to market researchers. Measurements of heart rate, breathing, and skin conductance have been used to determine audience arousal and attention. Cameras that track participants’ gaze and pupil dilation can also be used to gauge onlookers’ engagement and processing of ads. See Uma R. Karmarkar & Carolyn Yoon, *Consumer Neuroscience: Advances in Understanding Consumer Psychology*, 10 CURRENT OPINION PSYCHOL. 160, 163 (2016); Neal Ungerleider, *Eyetracking and the Neuroscience of Good Web Design*, FAST COMPANY (Oct. 17, 2013), <http://fastcompany.com/3019886/eyetracking-and-the-neuroscience-of-good-web-design>. These indirect measures of thought can be compared with the more direct measures represented by EEG and fMRI readings to help confirm or disprove findings. Daugherty & Hoffman, *supra* note 44, at 6–7.

46. See Karmarkar & Yoon, *supra* note 45, at 163.

47. Srivari Aishwarya, *US Army Researchers Study Neuroscience to Predict Soldier Activity*, ARMY TECH. (Aug. 3, 2016), <http://www.army-technology.com/uncategorised/newsus-army-researchers-study-neuroscience-to-predict-soldier-activity-4969662>.

48. Dinushi Dias, *How Consumer Neuroscience Is Transforming How We Shop*, SMARTCOMPANY (Apr. 20, 2016), <http://smartcompany.com.au/industries/retail/how-consumer-neuroscience-is-transforming-how-we-shop>; see also Shen, *supra* note 6, at 1057–59 (describing series of mobile, “[c]onsumer-friendly” brain stimulation devices). One limitation on EEG research is that it lacks the spatial resolution of fMRI imaging, which can make it difficult to identify the particular brain structures at play. But researchers are not limited to one method of brain imaging or the other. By combining fMRI and EEG measurements, neuroscientists can achieve maximal temporal and spatial definition in their studies. Stefan Debener et al., *Single-Trial EEG-fMRI Reveals the Dynamics of Cognitive Function*, 10 TRENDS COGNITIVE SCI. 558, 558 (2006).

49. Martin Reimann et al., *Functional Magnetic Resonance Imaging Consumer Research: A Review and Application*, 28 PSYCHOL. & MARKETING 608, 610 (2011). One can draw a distinction between “consumer neuroscience” and “neuromarketing.” Consumer neuroscience involves research into brain structure and function as they relate to buying decisions. Neuromarketing specifically applies this research to produce desired commercial outcomes. Both are relevant to this Article to the extent they reveal newfound abilities to understand and measure consumer thought.

branding strategies based on responses provided through consumer surveys and focus groups. The problem is that shoppers do not always tell the truth. Sometimes they misreport because they do not want to convey something embarrassing or taboo to their interlocutors. At other times, they simply cannot articulate or recognize their own thoughts in relation to an advertising or product stimulus.⁵⁰ Some high-profile product introductions, like “New Coke” in the 1980s, were rigorously vetted by sample consumers before their public rollout. Yet they still flopped. Surveyed consumers told market researchers what they wanted to hear instead of sharing their true feelings about the product.⁵¹

Neuroscientific methods of gauging consumer thought help avoid the problem of consumers who don’t know or don’t want to reveal what is going on in their heads. The number of firms specializing in neuromarketing is growing as businesses plow resources into this new kind of market research that avoids some of the traditional problems with consumer self-reporting.⁵² As the technology advances, neuroscientists are probing the main

50. Celine Solnais et al., *The Contribution of Neuroscience to Consumer Research: A Conceptual Framework and Empirical Review*, 36 J. ECON. PSYCH. 68, 69 (2013).

51. HENRY PETROSKI, SUCCESS THROUGH FAILURE 79 (2018) (Coca-Cola’s president and chief operating officer lamented that his company’s market research did not “measure or reveal the depth and abiding emotional attachment” of a significant group of consumers to the original Coke); Robert M. Schindler, *The Real Lesson of New Coke: The Value of Focus Groups for Predicting the Effects of Social Influence*, 4 MARKETING RES. 22, 22–27 (1992) (maintaining that that survey respondents did not accurately anticipate how negative reactions from others would reshape their own feelings about changes to the Coke formula).

52. A study published in 2010 could identify only sixteen companies offering neuromarketing services. Carl Erik Fisher et al., *Defining Neuromarketing: Practices and Professional Challenges*, 18 HARV. REV. PSYCHIATRY 230, 232 (2010). That number had grown to more than sixty by 2012. Ale Smidts et al., *Advancing Consumer Neuroscience*, 25 MARKETING LETTERS 257, 260 (2014). Today, the Neuromarketing Science & Business Association website lists over 120 companies specializing in consumer neuroscience. “*Neuromarketing Companies*,” NEUROMARKETING SCI. & BUS. ASS’N, <http://www.nmsba.com/neuromarketing-companies> (last visited Sept. 17, 2018). Another measure of the growing interest in neuromarketing comes from patent filings. Fewer than 400 so-called “neuro-technology” patent applications had been filed each year in the period from 2000 to 2009. That number had quadrupled to 1600 in 2014. Over 100 of these came from the market research firm Nielsen. *First-ever Pervasive Neurotechnology Report Finds 10,000+ Patent Filings Transforming Medicine, Entertainment and Business*, SHARPBRAINS (May 6, 2015), <https://sharpbrains.com/blog/2015/05/06/first-ever-pervasive-neurotechnology-report-finds-10000-patent-filings-transforming-medicine-entertainment-and-business>; *Surge in US “Brain-reading” Patents*, BBC NEWS (May 7, 2015), <http://www.bbc.com/news/technology-32623063>.

drivers of successful branding. Most important for courts deciding trademark disputes, these researchers are attempting to pinpoint the neural signs of trademark familiarity, comparison, and meaning.

1. Brand Familiarity

A central point of emphasis for neuromarketing is branding. Neuroscience cemented its unique ability to measure brand equity in a 2004 study. Test subjects took sips of Coke and Pepsi while their heads were in an fMRI scanner.⁵³ At first, the sipped brand remained hidden and subjects were simply asked to rate each cola's taste.⁵⁴ Participants expressed a slight taste preference for Pepsi.⁵⁵ Meanwhile, the scanner revealed a heightened response in a region of the brain that mediates pleasure and reward when the subjects drank Pepsi, thus matching the verbalized taste preference.⁵⁶ Next, the subjects did the same thing, but this time saw the brand name of the beverage before they took their sips.⁵⁷ Seeing the brand name not only triggered a switch in verbal preference, most participants now said they favored the taste of Coke, but also in neural activity.⁵⁸ Notifying subjects that they were drinking Coke prompted stronger neural responses in subjects than notifying them that they were drinking Pepsi.⁵⁹ The study proved that successful branding not only changes our reported enjoyment of a product, but it can actually change consumer brain chemistry, and this change can be measured.⁶⁰

Since 2004, researchers have built on the Coke study's findings to develop more precise measurements of brand influence in consumers' minds. A great deal of applied research involves fig-

53. Samuel M. McClure et al., *Neural Correlates of Behavioral Preference for Culturally Familiar Drinks*, 44 NEURON 379, 380 (2004).

54. *Id.* at 381.

55. *Id.*

56. *Id.* at 382.

57. *Id.*

58. *Id.* at 382–83.

59. *Id.* at 383.

60. *Id.* at 379. Aspects of McClure's study have been replicated by other researchers. See Michael Koenigs & Daniel Tranel, *Prefrontal Cortex Damage Abolishes Brand-Cued Changes in Cola Preference*, 3 SOC. COGNITIVE & AFFECTIVE NEUROSCIENCE 1, 1 (2008).

uring out how consumers perceive and retrieve memories of different brands.⁶¹ fMRI and EEG readings can assess how successful an advertiser has been in planting brand impressions in our minds. When a consumer is exposed to a strong brand like Coke, fMRI scanners detect activity in parts of the brain associated with value encoding and familiarity.⁶² Research already reveals differences in the firing rates of neurons in the two regions of the brain—the hippocampus and the amygdala—based on whether images are being viewed for the first time or have been seen before.⁶³ “With great specificity and sensitivity, researchers can, on the basis of brain data, determine whether lab subjects have or have not seen particular sets of words and images.”⁶⁴

Hence, consumer neuroscience offers the possibility of measuring how deeply a brand is etched into audience memories, information central to trademark law’s acquired distinctiveness analysis.⁶⁵ According to the neuroscientists doing this work, brain imaging now “provides a direct measure of the strength of encoding during the ad.”⁶⁶ Current analyses of acquired distinctiveness rely on circumstantial evidence—like sales volume and advertising expenditures—to determine the public’s familiarity with a mark. Neural imaging would seem to offer more direct

61. See, e.g., PHIL BARDEN, DECODED: THE SCIENCE BEHIND WHY WE BUY 84, 117 (2013); DOUGLAS VAN PRAET, UNCONSCIOUS BRANDING: HOW NEUROSCIENCE CAN EMPOWER (AND INSPIRE) MARKETING 81–82 (2012); Priyali Rajagopal & Nicole Votolato Montgomery, *I Imagine, I Experience, I Like: The False Experience Effect*, 38 J. CONSUMER RES. 578, 579 (2011).

62. See, e.g., Franz-Rudolf Esch et al., *Brands on the Brain: Do Consumers Use Declarative Information or Experienced Emotions to Evaluate Brands?*, 22 J. CONSUMER PSYCHOL. 75, 76 (2012); José Paulo Santos et al., *Neuroscience in Branding: A Functional Magnetic Resonance Imaging Study on Brands’ Implicit and Explicit Impressions*, 19 J. BRAND MGMT. 735, 735–36 (2012); see also Jesse Rissman et al., *Decoding fMRI Signatures of Real-World Autobiographical Memory Retrieval*, 28 J. COGNITIVE NEUROSCIENCE 604, 616 (2016) (finding that it is possible to decode from brain activity with a high degree of certainty whether a person recognizes a face or life-event as previously encountered or instead perceives it as novel).

63. Cerf et al., *supra* note 17, at 534.

64. Shen, *supra* note 6, at 1065.

65. Barton Beebe, *Search and Persuasion in Trademark Law*, 103 MICH. L. REV. 2020, 2032 (2005) (citation omitted) (“Trademark law, and the marketing literature with it, has long recognized that the more distinctive a trademark is from other marks, the greater is consumers’ ‘awareness’ of it and the more immediately ‘accessible’ it is in their memory.”).

66. Vinod Venkatraman et al., *Predicting Advertising Success Beyond Traditional Measures: New Insights from Neurophysiological Methods and Market Response Modeling*, 52 J. MARKETING RES. 436, 440 (2015).

and persuasive evidence of the public's recognition of a trademark.

It is less likely that consumer neuroscience can shed light on the analysis of inherent distinctiveness. While assessing whether consumers have a memory of a particular commercial stimulus seems firmly within the neuroscientists' grasp, the mental processes at work in determining whether a trademark inherently indicates the source of goods are more complicated.⁶⁷ Still, the hope would be that as researchers become more skilled at identifying neural correlates for specific mental states,⁶⁸ at some point, it will be possible to determine if a consumer interprets an unfamiliar mark as a source identifier or merely as a product descriptor. Such direct evidence of consumer perception might be considered more probative than judicial rules of thumb like the imagination and double entendre tests.

2. Confusion and Consumer Choice

Other consumer neuroscience research analyzes the ways consumers make choices. Consumer decision making typically requires a decision between shopping options: Should I buy Toothpaste A or Toothpaste B? Particular regions of the brain show different levels of activation depending on how the consumer is comparing brands. The brain's ventromedial prefrontal cortex processes the emotions involved when deciding between two trademarks.⁶⁹ One study demonstrates that this area of the brain exhibits different levels of activation when consumers evaluate advertising geared to brand usefulness as opposed to

67. See *infra* Part II.B.

68. See, e.g., Anna Beyeler et al., *Divergent Routing of Positive and Negative Information from the Amygdala During Memory Retrieval*, 90 NEURON 348 (2016) (identifying particular populations of neurons that "incorrectly" respond to positive stimuli in the brains of depressed subjects); Gillian A. Matthews et al., *Dorsal Raphe Dopamine Neurons Represent the Experience of Social Isolation*, 164 CELL 617, 617–18 (2016) (linking a specific cellular substrate to the experience of loneliness); Iris Vilares et al., *Predicting the Knowledge-Recklessness Distinction in the Human Brain*, 114 PROC. NAT'L ACAD. SCI. 3222, 3222 (2017) (using brain imaging to predict whether the subject was in a "knowing" or "reckless" mental state). Even fleeting emotions, like contentment or surprise, can be discerned via fMRI scans. Philip A. Kragel et al., *Decoding Spontaneous Emotional States in the Human Brain*, 14 PLOS BIOLOGY 1, 1 (2016).

69. Sam O. Al-Kwafi, *The Role of fMRI in Detecting Attitude Toward Brand Switching: An Exploratory Study Using High Technology Products*, 25 J. PRODUCT & BRAND MGMT. 208, 208 (2016).

brand pleasure.⁷⁰ Strong brands prompt consumers to emphasize short-term benefits over long-term gains,⁷¹ and different shopping contexts can cause brands to have more or less importance to our buying decisions.⁷² One can see how these insights could be useful not just from the perspective of advertising effectiveness, but from a legal perspective. If certain environmental factors cause consumers to be less thoughtful or, in the parlance of trademark law, less sophisticated, their presence should make confusion more likely.

Researchers also tout “the potential to detect brand confusion” from studying the activity of a single neuron known to respond in a particular way to a particular brand stimulus.⁷³ The idea seems to be that if Coke has a unique neural signature and a rival usage (e.g., “Koke”) triggers that same neural signature in consumers’ brains, that could be compelling evidence of consumer confusion. If a unique neuromark can be defined for a well-known brand, then an interloper whose mark triggers the same neural associations in consumers’ heads may be accused of infringement.

Admittedly, there is a distinction between recognizing the plaintiff’s trademark when viewing the defendant’s mark and being confused into thinking that the defendant’s mark is the plaintiff’s mark. Hence, trademark confusion could not be conclusively demonstrated by showing that consumers exhibited the same neural signature when viewing the defendant’s mark as when they viewed the plaintiff’s mark. At the least, however, evidence of this kind of recognition would be suggestive of confusion. After all, the current likelihood of confusion test considers mark similarity to be extremely probative of confusion.⁷⁴ In a

70. *Id.* at 212–13.

71. This is true even for decisions unrelated to the brand. Carsten Murawski et al., *Led into Temptation? Rewarding Brand Logos Bias the Neural Encoding of Incidental Economic Decisions*, 7 PLOS ONE 1, 5–6 (2012). Other studies show a concomitant lessening of reflective thinking when subjects recognize one of their favorite trademarks. Martin Reimann et al., *Novel Versus Familiar Brands: An Analysis of Neurophysiology, Response Latency, and Choice*, 23 MARKETING LETTERS 745, 753–56 (2012).

72. See Hilke Plassmann, *What Can Advertisers Learn from Neuroscience?*, 26 INT’L J. ADVERT. 151, 162–63 (2007) (discussing studies showing that shopping situations that put consumers under time constraints or offer little tangible information cause greater reliance on and higher consumer valuation of well-known trademarks).

73. Cerf et al., *supra* note 17, at 534.

74. See *A & H Sportswear, Inc. v. Victoria’s Secret Stores, Inc.*, 237 F.3d

sense, the ability to compare brands' neural signatures would offer a richer, more detailed portrait of mark similarity, one that substitutes direct evidence of consumer perception for judicial guesswork.

3. Brand Meaning

Finally, scientists seek to neurologically test not just brand familiarity, but brand meaning. Even strong brands differ in the meanings they encode in consumers' memories. A key component of brand meaning is the ability to make a trademark serve as a signifier of status within the consumer's social group. Neuromarketers diagnose certain areas of the brain that show increased activity when a brand successfully signals status to a consumer.⁷⁵ Brain activity can also indicate when a brand is culturally familiar to a particular demographic. For example, when German test subjects were presented with different luxury car logos (e.g., BMW vs. Acura), a particular region of the prefrontal cortex was activated only by the culturally familiar logos.⁷⁶ Neuroscience studies also reveal that exposure to brands with reputations for style or creativity causes consumers to behave more impulsively.⁷⁷

There are efforts underway to identify neural traits for categories even more specific than "status brands," "culturally familiar brands," or "creative brands." As described by one group of consumer neuroscientists, the research is now at the stage where "the brands a consumer is thinking about can be reliably predicted from patterns of neural activations."⁷⁸ Just by showing

198, 216 (3d Cir. 2000) ("The single most important factor in determining likelihood of confusion is mark similarity.").

75. VAN PRAET, *supra* note 61, at 44–47; Christopher N. Cascio et al., *Neural Correlates of Susceptibility to Group Opinions in Online Word-of-Mouth Recommendations*, 52 J. MARKETING RES. 559, 560 (2015); Michael Schaefer & Michael Rotte, *Thinking on Luxury or Pragmatic Brand Products: Brain Responses to Different Categories of Culturally Based Brands*, 1165 BRAIN RES. 98, 101–02 (2007).

76. Michael Schaefer et al., *Neural Correlates of Culturally Familiar Brands of Car Manufacturers*, 31 NEUROIMAGE 861, 863–64 (2006).

77. See Murawski et al., *supra* note 71, at 5–6 (describing how exposure to the Apple logo was associated with activation of the brain's reward system and "immediately available reward alternatives" were assigned a higher relative value).

78. Colin Camerer & Carolyn Yoon, *Introduction to the Journal of Marketing Research Special Issue on Neuroscience and Marketing*, 52 J. MARKETING RES. 423, 424 (2015).

consumers brand names and looking at the resulting fMRI measurements, these researchers were able to tell whether the consumer was thinking about Louis Vuitton or Coca-Cola, IBM or Google.⁷⁹ Patterns of brain activity can even be translated into brand personality traits, revealing that consumers think of Campbell's Soup as "sincere," Ford as "rugged," and Mercedes-Benz as "sophisticated."⁸⁰ Neuromarks promise to reveal not just the degree of consumer recognition of a trademark, but how consumers feel about and understand the brand at issue.

Assessments of brand meaning bear on actions for trademark dilution that require courts to determine whether a defendant's non-confusing use of a similar mark "harms the reputation" of the plaintiff's mark.⁸¹ To date, the difficulty in determining whether an association will develop in the consumer's head after witnessing the defendant's unauthorized use of a famous mark has limited the viability of the dilution cause of action.⁸² Also difficult is assessing the reputational effects of such an association.⁸³ Better insights into brand meaning could change this. If a perceived brand meaning can be determined through neural scans, then it seems plausible that changes to that meaning in response to the defendant's mark can be assessed as well.⁸⁴

4. Limitations and Concerns

Some final words of caution are appropriate when considering consumer neuroscience's potential. fMRI and EEG results undoubtedly reveal a wealth of information about consumer thought that was not available just a few years ago. At the same time, the meaning of this information is not always apparent. There is a certain amount of subjectivity inherent in the reading of brain scans; it is not always clear how an influx of blood or

79. Chen et al., *supra* note 18, at 455–58.

80. *Id.* app. at 14 fig.S3. Other studies complement these neuroscientific assessments of brand personality by looking for response latencies when brands are paired with positive and negative words. See, e.g., Claudiu V. Dimofte, *Implicit Measures of Consumer Cognition: A Review*, 27 *PSYCHOL. & MARKETING* 921, 925–28 (2010).

81. 15 U.S.C. § 1125(c)(2)(C) (2012).

82. See *infra* notes 177–78.

83. See *infra* notes 181–84.

84. See Chen et al., *supra* note 18, at 464 (“[F]uture studies extending our approach could begin to quantify the extent to which marketing actions affect consumers’ mental representations of brand personality.”).

electrical impulses to a particular neural territory should be interpreted. The consumer memories and emotions that translate into brand distinctiveness and brand meaning involve complex processes occurring across the entire brain, not just one neural area. While it is fairly clear that particular emotional responses (e.g., pain, fear, happiness) activate different regions in the brain, it is not so clear that when one of these regions is activated, a researcher can infer that a particular emotional state has been reached. This means that consumer neuroscientists have work to do before they can claim evidence of one legally-significant mental state like confusion versus another like mere recognition.

Another objection might be to the ability of the neuromark to identify an empirically sound baseline for consumer perception of a particular brand. Neuroscientists would need to hone their imaging capabilities so that two rivals with a reputation for “ruggedness” (think truck sellers Dodge and Ford) could be distinguished from each other. There is also the problem of a brand’s meaning evolving over time, both intentionally and unintentionally. Strategic decisions to change selling strategies, e.g., moving from a luxury brand model to more of a low price model, would undoubtedly change consumer perceptions and thereby alter the neuromark of the brand at issue. Even choosing to extend a brand into different territories, say from packaged foods to housewares, could modify a mark’s neural signature. The Pierre Cardin trademark once had a reputation for glamour, but rampant licensing of the name on everything from frying pans to sardines reshaped consumer associations.⁸⁵ Somewhat similarly, ENRON meant one thing to consumers in 2000; it meant something far different after the company’s bankruptcy and fraudulent accounting scandal in 2001. If neuromarks are inherently unstable, one might question their value as a tool for detecting changes in mark reputation and assessing consumer confusion.

Both of these concerns deserve weight in evaluating the current probative value of neuroscientific evidence for trademark law. But it is also important to realize that neuroscientists are

85. Barton Beebe, *Intellectual Property Law and the Sumptuary Code*, 123 HARV. L. REV. 809, 821 (2010); cf. Amanda Lauren, *10 Luxury Brands No One Wants Anymore*, THE RICHEST (July 13, 2014), <https://www.therichest.com/expensive-lifestyle/fashion/10-luxury-brands-no-one-wants-anymore> (discussing ten brands that consumers no longer want because of changes to their reputation).

aware of these criticisms and are taking them into account. Researchers are becoming more adept at discerning multiregional brain activity that describes a unique cognitive condition. For example, a recent study employing such an approach was able to predict with a high degree of accuracy whether subjects were in a “knowing” mental state versus a “reckless” one—categories that are often criticized for being hard to differentiate yet triggering dramatically different punishments under criminal law.⁸⁶ By examining a variety of brain regions at once, consumer neuroscientists can already pinpoint differences in neural signatures among closely-related brands like Coke and Pepsi and Apple and Microsoft. As the technology and understanding of the brain advances, the ability to make fine-grained distinctions between consumer perceptions of a mark’s attributes should improve.

Admittedly, brand meanings change, which means the timing of when a neural snapshot is taken and submitted into evidence in a trademark case will be critical. But this is an issue that trademark law already has to negotiate. Courts accept survey evidence predating the defendant’s allegedly infringing use, reasoning that such evidence can be relevant while also considering timing in determining the survey’s ultimate probativity.⁸⁷ A plaintiff that tried to offer evidence of changes to its neuro-mark based on the defendant’s activity would lose credibility if its neural evidence of the brand’s baseline reputation was years out of date. In addition, defendants would be free to refute such stale evidence by conducting their own, more up-to-date neural imaging tests.

One other concern frequently posited in discussions of criminal law and neuroscience deserves mention. Most neuroscientific research involves the aggregation of many brain scans, not the neural analysis of a single person. As a result, neuroscience can often offer information on general propensities, but not absolute indications of legally-relevant mental characteristics for a specific individual, like a criminal defendant.⁸⁸

86. Vilares et al., *supra* note 68, at 3222.

87. See, e.g., *Gen. Motors Corp. v. Lanard Toys, Inc.*, 468 F.3d 405, 419 (6th Cir. 2006).

88. Arielle R. Baskin-Sommers & Karelle Fonteneau, *Correctional Change Through Neuroscience*, 85 *FORDHAM L. REV.* 423, 424 (2016); see also David L. Faigman et al., *Group to Individual (G2i) Inference in Scientific Expert Testimony*, 81 *U. CHI. L. REV.* 417, 419–20, 472–78 (2014) (offering best practices for translating scientific research as to group practices into legal decisions about individuals).

Trademark law's focus on consumer perception does, however, rely on information about aggregate consumer propensities to determine whether or not a trademark is protectable or infringement has taken place.⁸⁹ It is the mental state of an entire purchasing population that matters.⁹⁰ In this way, neuroscience has greater potential applicability to trademark law than other legal subject areas that hinge on the mental state of one individual.⁹¹

Finally, even if some of these concerns cast doubt on the current reliability and precision of consumer neuroscience, it is still important to lay the analytical groundwork for brain imaging's relationship to trademark law. At times, courts embrace scientific evidence that turns out to have limited empirical validity. The questionable use of latent fingerprints to identify criminal suspects is a good example.⁹² One might also point to earlier movements in law and brain science, like the use of phrenology to determine insanity and propensities for dangerousness.⁹³

89. Moreover, aggregated evidence of confusion or acquired distinctiveness need not reflect the majority of prospective purchasers. Survey results demonstrating confusion in less than twenty percent of the relevant population is considered probative of likelihood of confusion. 6 MCCARTHY, *supra* note 36, § 32:185. To prove acquired distinctiveness, a showing that only fifty percent of respondents associate the mark at issue with a particular source of goods is generally sufficient. *Id.* § 32:190.

90. Many trademark law issues involve assessing the national consuming public's perception of the trademarks at issue. For example, an action for trademark dilution requires the trademark holder to establish that its trademark is "widely recognized by the general consuming public of the United States." 15 U.S.C. § 1125(c)(2)(A) (2012). For other issues of trademark law, consumer perception in only a limited territory is relevant. *E.g.*, *Tex. Tech. Univ. v. Spiegelberg*, 461 F. Supp. 2d 510, 524 n.2 (N.D. Tex. 2006) (assessing whether a university's color scheme was distinctive "[i]n the area around Texas Tech"). Regardless, in contrast to criminal law, judges and juries in trademark cases must determine the mental state of large aggregate groups of consumers, not of single individuals.

91. Although some may question how generalizable neuroscience findings about brand perceptions are, neuroscientific tests that involve a sample size of only a handful of people have produced findings applicable to large populations. Emily B. Falk et al., *From Neural Responses to Population Behavior: Neural Focus Group Predicts Population-Level Media Effects*, 23 PSYCHOL. SCI. 439, 444 (2012) (explaining that "behavioral responses of entire populations whose brains are never examined may be inferred from the brain activations of a small neural focus group"); Karmarkar & Yoon, *supra* note 45, at 161.

92. Robert Epstein, *Fingerprints Meet Daubert: The Myth of Fingerprint "Science" Is Revealed*, 75 S. CAL. L. REV. 605, 607 (2002) (contending that the "science" of fingerprint evidence is "an unfounded creation of law enforcement fingerprint examiners").

93. See Amanda C. Pustilnik, *Violence on the Brain: A Critique of Neuroscience in Criminal Law*, 44 WAKE FOREST L. REV. 183, 191–95 (2009).

Multiple studies demonstrate the persuasive force of modern brain imaging data, even if that persuasive force is sometimes unwarranted.⁹⁴ Meanwhile, consumer neuroscientists claim to be closing in on some of the questions central to trademark law. Researchers may not yet be able to pinpoint exactly what a mind looks like that is confused or that recognizes a brand as indicating the source of a product. But they contend that they are getting closer, and trademark law needs to think about how it should react once they get there.⁹⁵

II. NEUROSCIENCE'S LIKELY PATH IN TRADEMARK CASES

How will trademark law actually respond to a changing scientific understanding of the consuming mind? This Part tries to answer that question by examining historical precedent. Most discussions of “neurolaw” lack a historical perspective.⁹⁶ The his-

94. See, e.g., Diego Fernandez-Duque et al., *Superfluous Neuroscience Information Makes Explanations of Psychological Phenomena More Appealing*, 27 J. COGNITIVE NEUROSCIENCE 926, 926 (2015) (describing how “superfluous neuroscience information increased the judged quality of the argument for both good and bad explanations”); David P. McCabe et al., *The Influence of fMRI Lie Detection Evidence on Juror Decision-Making*, 29 BEHAV. SCI. & L. 566, 566 (2011) (“Results showed that fMRI lie detection evidence led to more guilty verdicts than lie detection evidence based on polygraph evidence, thermal facial imaging, or a control condition that did not include lie detection evidence. However, when the validity of the fMRI lie detection evidence was called into question on cross-examination, guilty verdicts were reduced to the level of the control condition.”).

95. Some of the examples of applied neuroscientific study described in this Part could potentially be illegal when executed in the marketplace instead of part of an academic experiment. The Federal Trade Commission (FTC) could impose penalties on neuromarketing techniques deemed “unfair” or “deceptive.” Implanting brand memories in consumers without their awareness might run afoul of various consumer protection statutes. In other work, I make the case that legal authorities need to monitor and regulate the use of this research against consumers. See MARK BARTHOLOMEW, *ADCREEP: THE CASE AGAINST MODERN MARKETING* 117–22 (2017) (arguing that regulators such as the FTC and Institutional Review Boards (IRBs) should more heavily scrutinize neuromarketing). Whether and how advertisers should be prevented from operationalizing their new neural understandings is not the focus of this Article, however. Instead, the Article asks what courts are likely to do and what they should do with evidence that offers a better understanding of the consumer mind.

96. Psychologist and science historian Fernando Vidal traces an “ahistorical triumphalism characteristic of the *neuro* field.” Fernando Vidal, *Brainhood, Anthropological Figure of Modernity*, 22 HIST. HUM. SCI. 5, 10 (2009); see also Francis X. Shen, *The Overlooked History of Neurolaw*, 85 FORDHAM L. REV. 667, 667–68 (2016).

tory of law and psychology in general and the interaction between neuroscience and criminal law in particular both suggest that brain imaging is unlikely to work a complete overhaul of trademark law. Instead, as with the introduction of confusion surveys administered by psychologists in the early twentieth century, consumer neuroscience will produce limited yet significant changes in evidence and doctrine in trademark cases.⁹⁷ This Part is predictive, not normative. Part III interrogates whether these predicted changes will lead to better or worse outcomes in trademark cases.

A. THE EXAMPLE OF CRIMINAL LAW AND NEUROSCIENCE

Nowhere has there been more anticipation of a neurolaw revolution than in the field of criminal law. There are certainly skeptics,⁹⁸ but many scholars tout brain science as replacing “the law’s guesswork about the ways in which certain mental conditions might impact criminal responsibility.”⁹⁹ Brain imaging is already part of the evidentiary record for all manner of criminal cases.¹⁰⁰ Yet some predicted that neuroscience would serve not just as an evidentiary supplement but as a force for radical change, reshaping the essential doctrines and theories animating criminal law. Most famously, in 2004, Joshua Greene and

97. There is no particular standard for evaluating expert testimony involving social science; instead, the same general gatekeeping rules apply for both scientific and non-scientific expert testimony. 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, 641–42 (2010). Hence, whether one categorizes consumer neuroscience evidence as hard science or soft science, the general judicial method of interrogating its admissibility is the same. *See id.*

98. *See* Adam J. Kolber, *Will There Be a Neurolaw Revolution?*, 89 IND. L.J. 807, 807–09 (2014) (arguing that there will not be a neurolaw “revolution” that radically changes beliefs on criminal responsibility); Stephen J. Morse, *Criminal Law and Common Sense: An Essay on the Perils and Promise of Neuroscience*, 99 MARQ. L. REV. 39, 42 (2015) (claiming that “our commonsense understanding of agency and responsibility and the legitimacy of criminal justice generally are not imperiled by contemporary discoveries in the various sciences, including neuroscience and genetics”).

99. Vilares et al., *supra* note 68, at 3227; *see also* Richard E. Redding, *The Brain-Disordered Defendant: Neuroscience and Legal Insanity in the Twenty-First Century*, 56 AM. U. L. REV. 51, 56 (2006) (contending that we are “closer to realizing the early criminologist’s dream of identifying the biological roots of criminality”).

100. Brown & Murphy, *supra* note 2, at 1132; Farahany, *supra* note 1, at 488–89; *see also* Denno, *supra* note 3, at 494–99 (showing that neuroscientific evidence is being used to mitigate sentencing in murder cases).

Jonathan Cohen contended that neuroscience will “have a transformative effect on the law . . . by transforming people’s moral intuitions about free will and responsibility.”¹⁰¹ According to Greene and Cohen, neuroscience will cause us to be more sympathetic to others as products of biological determinism, forcing legal actors to analyze human behavior less in retributivist, Old Testament terms and more in terms of actual social consequences.¹⁰² Along these lines, a growing literature debates neuroscience’s revolutionary implications for the future of punishment.¹⁰³

Contrary to Greene and Cohen’s prediction, however, there has been no criminal law neurorevolution. Neuroscientific evidence is being admitted in criminal cases, but the record does not reveal fMRI readings prompting a shift in judicial focus from individual blame to group consequences.¹⁰⁴ To the contrary, neuroscience has become an important evidentiary resource for prosecutors arguing for individual culpability. Neural images showing the absence of organic brain damage are used to refute defendants’ mitigation claims at sentencing.¹⁰⁵ Judges sometimes even seize on seemingly unrelated neuroscientific evidence to presume a defendant’s level of intentionality in favor of the prosecution. As Deborah Denno recounts, courts interpret neural evidence of *a victim* suffering from shaken baby syndrome not just as proof of injury but as evidence of *the defendant’s* culpable mental state.¹⁰⁶ At best, neuroscience’s use in the courtroom has been a mixed bag for anti-retributivist criminal law scholars. It has become a part of criminal law while failing to change its fundamental doctrinal frameworks and fixation on individual responsibility.¹⁰⁷

101. Joshua Greene & Jonathan Cohen, *For the Law, Neuroscience Changes Nothing and Everything*, 359 PHIL. TRANSACTIONS ROYAL SOC’Y LONDON B. 1775, 1775 (2004).

102. *Id.*

103. See sources cited *supra* note 5; see also Allan McCay & Jeanette Kennett, *My Brain Made Me Do It: Will Neuroscience Change the Way We Punish Criminals?*, CONVERSATION (May 25, 2016), <https://theconversation.com/my-brain-made-me-do-it-will-neuroscience-change-the-way-we-punish-criminals-57571>.

104. Kolber, *supra* note 98, at 814–15.

105. Lyn M. Gaudet & Gary E. Marchant, *Under the Radar: Neuroimaging Evidence in the Criminal Courtroom*, 64 DRAKE L. REV. 577, 654 (2016).

106. Deborah W. Denno, *Concocting Criminal Intent*, 105 GEO. L.J. 323, 323 (2017).

107. Owen D. Jones & Francis X. Shen, *Law and Neuroscience in the United States*, in INTERNATIONAL NEUROLAW: A COMPARATIVE ANALYSIS 354, 361

Why hasn't neuroscience triggered greater legal change in criminal law? Even before criminal defendants sought to introduce fMRI readings into evidence, behavioral studies demonstrated that human beings are influenced by their environment to a greater extent than most realize.¹⁰⁸ Forces that we are unaware of poke and prompt us into action. The psychologist's situationist view of human behavior clashes with the dispositionist underpinnings of the American legal system.¹⁰⁹ The legal concepts of causation, responsibility, and blame rely on a default understanding of human behavior that is largely autonomous and resistant to outside forces. Despite years of research pushing against this understanding, those concepts remain firmly in place.¹¹⁰ Given the long history of psychologists and criminal law scholars failing to convert judges to their situationist cause, it is

(Tade M. Spranger ed., 2012). One significant change in criminal law that can be traced to neuroscience is the prohibition of certain punishments for juvenile offenders under the Cruel and Unusual Punishments Clause of the Eighth Amendment. In three recent cases, the Supreme Court referenced neuroscientific studies of the adolescent brain to deem juveniles less culpable and more capable of reform than adult offenders. See *Miller v. Alabama*, 567 U.S. 460, 472 n.5 (2012) (barring mandatory sentence of life-without-parole for juvenile offenders in homicide cases); *Graham v. Florida*, 560 U.S. 48, 68 (2010) (barring mandatory sentence of life-without-parole for juvenile offenders in non-homicide cases); *Roper v. Simmons*, 543 U.S. 551, 551 (2005) (barring death penalty for crimes committed by juvenile offenders). Rather than representing a fundamental transformation of the criminal law, however, these cases fit into a larger pattern of using psychological research to carve out special exceptions for children. See, e.g., *Maryland v. Craig*, 497 U.S. 836, 836 (1990) (relying on insights from clinical psychology to uphold a Maryland statute that allowed children to testify via one-way closed circuit television); Jeremy A. Blumenthal, *Law and Social Science in the Twenty-First Century*, 12 S. CAL. INTERDISC. L.J. 1, 13 (2002) (describing successful efforts by psychologists to place certain decisions in legal disputes involving children in the hands of clinical experts and away from the jury).

108. For decades, neuroscience has called the ability of individuals to take conscious control of their actions into question. A primitive but well-publicized EEG study from 1983 detected brain activity predicting the action of pushing a button hundreds of milliseconds before the actor became consciously aware that she intended to push the button. See Benjamin Libet et al., *Time of Conscious Intention to Act in Relation to Onset of Cerebral Activity (Readiness Potential): The Unconscious Initiation of a Freely Voluntary Act*, 106 BRAIN 623, 623–24 (1983).

109. Adam Benforado & Jon Hanson, *Backlash: The Reaction to Mind Sciences in Legal Academia*, in IDEOLOGY, PSYCHOLOGY, AND LAW 501, 520–30 (Jon Hanson ed., 2012).

110. See *id.* at 503; see also MICHAEL S. PARDO & DENNIS PATTERSON, MINDS, BRAINS, AND LAW: THE CONCEPTUAL FOUNDATIONS OF LAW AND NEUROSCIENCE 36 (2013) (contrasting law's default rule towards individuals being responsible for their actions with psychologists' greater concern with environmental influences on behavior).

perhaps not surprising that neuroscience's impact has been similarly limited.

The recent history of criminal law and neuroscience illustrates a larger pattern. Just as there is a problem with assuming that neuroscience will transform criminal law, it is unlikely that neuroscience will uproot the distinctiveness and likelihood of confusion analyses. It would be destabilizing to replace these doctrines. These two analyses are the linchpins of trademark litigation and have existed in relatively the same form for forty years.¹¹¹ They afford judges a tremendous amount of discretion, which would be forfeit if junked in favor of fMRI results.

Judges are loathe to cede large territories of authority to outside experts.¹¹² However compelling, psychological insights typically do not replace wholesale the established prerogatives of judges and juries.¹¹³ Although law is fundamentally concerned with human behavior and neuroscientific evidence is changing our view of human behavior, ultimately legal precepts involve value judgments that are rarely shaken by scientific evidence, no matter how empirically compelling.¹¹⁴ The author of a comprehensive analysis of legislation relating to neuroscience finds that "neuroscience is typically embraced when it affirms, rather than challenges, preexisting normative commitments."¹¹⁵ Predictions of neuroscience's transformative impact on the law need to be leavened by an appreciation of the fundamentally conservative nature of legal change.

111. See Daniel M. McClure, *Trademarks and Competition: The Recent History*, 59 L. & CONTEMP. PROBS. 13, 28–33 (1996) (discussing the history of the distinctiveness and likelihood of confusion analyses).

112. Craig Haney, *Psychology and Legal Change: On the Limits of a Factual Jurisprudence*, 4 LAW & HUM. BEHAV. 147, 165 (1980).

113. For example, Federal Rule of Evidence 704 provides that, in criminal cases, "an expert witness must not state an opinion about whether the defendant did or did not have a mental state or condition that constitutes an element of the crime charged or of a defense. Those matters are for the trier of fact alone." FED. R. EVID. 704(b). Even in the civil context, courts must exclude expert testimony that defines legal terms or offers "nothing more than a legal conclusion." *Woods v. Lecureux*, 110 F.3d 1215, 1220 (6th Cir. 1997).

114. ANDREAS KAPARDIS, *PSYCHOLOGY AND LAW: A CRITICAL INTRODUCTION* 12 (2d ed. 2003) ("[T]he prevailing legal model of man entails a conscious mind. . . . [T]his model is unlikely to be shifted in the face of psychological knowledge.").

115. Francis X. Shen, *Neurolegislation: How U.S. Legislators Are Using Brain Science*, 29 HARV. J.L. & TECH. 495, 498 (2016).

B. LAW, PSYCHOLOGY, AND KALVEN'S MIDDLE RANGE

But if neuroscience will not revolutionize trademark doctrine, it will likely shape it in significant albeit contained ways. Deeply held values like the criminal justice system's focus on individual blame will always withstand assault from psychological evidence to the contrary. At the same time, well-known factual propositions like the unreliability of hearsay have no need for bolstering from psychological study. In between these two poles lies the area where outside study of human behavior can reshape the law.

The legal scholar Harry Kalven speculated that social science influences the law in a "middle range" "where the premises are not that unshakeable and where the facts are not that accessible."¹¹⁶ Changes to this middle area do not threaten to topple fundamental pillars of the legal system. Because their effects are limited in scope, such changes are also less threatening to judicial prerogatives and more likely to be accepted.

The introduction of psychologist-approved surveys of consumer confusion in trademark cases offers an instructive example of the phenomenon Kalven described. In the early twentieth century, reformers called for replacing the ad hoc "judicial estimate of the state of the public mind"¹¹⁷ with psychologist expert testimony.¹¹⁸ The most concrete and lasting innovation proposed by the reformers was to use expert-led consumer surveys to demonstrate confusion.¹¹⁹ Multiple psychologists contended that their expertise was needed to rein in a body of law being mishandled by untrained judges.¹²⁰

Rather than being offended by the psychologists' presumption to tell the judiciary how to do their job, a Second Circuit

116. Harry Kalven, Jr., *The Quest for the Middle Range: Empirical Inquiry and Legal Policy*, in *LAW IN A CHANGING AMERICA* 56, 65–67 (Geoffrey Hazard, Jr. ed., 1968).

117. FRANK I. SCHECHTER, *THE HISTORICAL FOUNDATIONS OF THE LAW RELATING TO TRADE-MARKS* 166 (1925).

118. Edward S. Rogers, *The Unwary Purchaser: A Study in the Psychology of Trade Mark Infringement*, 8 *MICH. L. REV.* 613, 621–22 (1910).

119. Other, more ambitious initiatives didn't fare so well, like a call in the 1930s for "plain psychological facts" to replace legal concepts of intent, the reasonable person, and stare decisis. Wallace D. Loh, *Psycholegal Research: Past and Present*, 79 *MICH. L. REV.* 659, 664 (1981).

120. See, e.g., HUGO MUNSTERBERG, *PSYCHOLOGY AND INDUSTRIAL EFFICIENCY* 285 (1913); Harold E. Burt, *Measurement of Confusion Between Similar Trade Names*, 19 *ILL. L. REV.* 320, 336 (1924–25); Edward S. Rogers, *An Account of Some Psychological Experiments on the Subject of Trade-Mark Infringement*, 18 *MICH. L. REV.* 75, 77 (1919).

judge cited an academic psychologist's results to proclaim that judicial assays of confusion "failed to match the responses of ordinary consumers."¹²¹ Other courts agreed to shore up their analysis by admitting in as evidence the surveys of consumer confusion conducted by psychologists.¹²² Not every judge welcomed the intrusion of outside "experts" into an area that had traditionally been within their sole discretion. In fact, some courts balked, refusing to accept consumer surveys.¹²³ Nevertheless, the overall trend was one of more and more surveys being accepted into evidence.¹²⁴

The admission of survey evidence of consumer perception fits within Kalven's middle range where social science can influence the law. The survey evidence proffered by early twentieth-century psychologists did not purport to uproot a deeply held legal premise. It simply provided evidence of "actual confusion," albeit in an artificial setting, not the actual marketplace.¹²⁵ The results of these surveys tended to support rather than erode a general preference for strong trademark rights.¹²⁶ Their admission into evidence seemed very much in keeping with the goals of trademark law.¹²⁷

121. *LaTouraine Coffee Co. v. Lorraine Coffee Co.*, 157 F.2d 115, 124 (2d Cir. 1946) (Frank, J., dissenting).

122. *See Coca-Cola Co. v. Chero-Cola Co.*, 273 F. 755, 756–57 (D.C. Cir. 1921); Robert Bonyngne, *Trademark Surveys and Techniques and Their Use in Litigation*, 48 A.B.A. J. 329, 330 (1962).

123. *See, e.g., Procter & Gamble Co. v. Sweets Labs., Inc.*, 137 F.2d 365, 368 (C.C.P.A. 1943). This is not to suggest that judges cede all authority to outside experts once the decision is made to admit their testimony. Even after deciding to allow expert testimony into evidence, judges still maintain a role in policing and exposing scientific bias as testimony is presented. SHEILA JASANOFF, *SCIENCE AT THE BAR* 20 (1995). This is even more true now in the wake of the U. S. Supreme Court's *Daubert* decision, which replaced an earlier assessment of "general acceptance" of a proffered theory in the relevant scientific field with a more searching judicial interrogation of the research methods and analyses behind expert testimony. John Monahan & Laurens Walker, *Social Science in Law: Continuity and Change*, in *OXFORD HANDBOOK OF PSYCHOLOGY AND LAW* (forthcoming 2018) (manuscript at 9) (on file with author). Even so, the introduction of scientific evidence represents a lessening of judicial authority and one that judges must be convinced to accept.

124. *See Shari Seidman Diamond & David J. Franklyn, Trademark Surveys: An Undulating Path*, 92 TEX. L. REV. 2029, 2039–40 (2014); Robert J. Lavidge, *Survey Research in Trademark Cases*, 66 CHI. B. REC. 236, 236 (1985).

125. *See, e.g., Chero-Cola*, 273 F. at 757 (using survey evidence as proof of "actual confusion").

126. *See Mark Bartholomew, Advertising and the Transformation of Trademark Law*, 38 N.M. L. REV. 1, 26 (2008).

127. *See id.*

Other attempts by psychologists to change legal doctrine in this era foundered when critics deemed the common sense of judges and juries to be sufficient.¹²⁸ Judges believed that psychologists offering advice on witness veracity in the early twentieth century seemed to offer a solution to a problem that did not exist. After all, they already considered themselves (and the juries they instructed) adept at assessing the credibility of witnesses.¹²⁹ Trademark survey evidence differed in that it purported to measure the thought processes of not just one person, but the entire consuming public. Although judges and juries routinely assessed the mental states of individual defendants, there was less comfort with having the trier of fact speak for an entire mass of shoppers.¹³⁰ Psychologists touted their unique ability to study consumer thought “objectively by psychological experiments . . . [using] the laboratory method.”¹³¹ As a result, judges accepted the professional qualifications of consumer psychologists and admitted the surveys they conducted into evidence.¹³²

Over time, surveys became a critical component of modern trademark law. The early skepticism over such evidence largely vanished. Today, trademark law’s leading scholar maintains that surveys have reached a level of reliability such that they should be routinely admitted to guide the determination of trademark disputes.¹³³ Although some empirical studies suggest that survey evidence plays a less-than-decisive role in the majority of trademark infringement decisions,¹³⁴ the research also

128. Blumenthal, *supra* note 107, at 8.

129. *Cf. id.* (“[O]n almost every topic that has a proximate and practical relation to the trustworthiness of testimony delivered in court, the judges have the psychologists ‘beaten a mile’ [sic.]” (quoting Charles C. Moore, *Yellow Psychology*, 11 L. NOTES 125, 125 (1907))).

130. *See* Bartholomew, *supra* note 126, at 24–25 (describing how Progressive movement members advocated for expert-led surveys because of their ability to remove judicial biases).

131. Burt, *supra* note 120, at 335.

132. *See* Blumenthal, *supra* note 107, at 25–26.

133. 6 MCCARTHY, *supra* note 36, § 32:196 (contending that judges “know that the techniques of testing and sampling buyer reactions have been developed to a fairly high degree of accuracy”).

134. *See, e.g.,* Barton Beebe, *An Empirical Study of the Multifactor Tests for Trademark Infringement*, 94 CALIF. L. REV. 1581, 1641–42 (2006) [hereinafter Beebe, *Empirical Study*] (sampling 331 opinions and finding that survey evidence only played a role, let alone a decisive one, in twenty percent of them); *see also* Kevin Blum et al., *Consistency of Confusion? A Fifteen-Year Revisiting of Barton Beebe’s Empirical Analysis of Multifactor Tests for Trademark Infringement*, 2010 STAN. TECH. L. REV. 3, 30 (repeating Beebe’s research using a fifteen-year sample of cases).

shows that surveys can strongly influence the infringement analysis when introduced¹³⁵ and are employed widely in the pre-trial stages of trademark litigation.¹³⁶ In addition to surveying confusion, modern experts provide surveys relating to mark distinctiveness, strength, and dilution.¹³⁷ Scholars in other legal disciplines have noticed, describing trademark law's favorable treatment of surveys as placing it at the vanguard of incorporating social science evidence into adjudication.¹³⁸

Consumer neuroscience evidence may work its way into trademark law in a similar fashion as survey evidence. At least in the near term, it will not replace judicial estimates of consumer perception. But it will influence those estimates and, as a result, alter specific areas of trademark law. These probable areas of influence can be divided into two broad categories: evidence and doctrine.

135. Beebe, *Empirical Study*, *supra* note 134, at 1641 ("It is generally thought that survey evidence is the best evidence of actual confusion, and indeed, that a good survey has the potential to supersede the rest of the multifactor analysis."); Robert C. Bird & Joel H. Steckel, *The Role of Consumer Surveys in Trademark Infringement: Empirical Evidence from the Federal Courts*, 14 U. PA. J. BUS. L. 1013, 1041 (2012) ("In some situations, survey evidence can have a profound impact.").

136. Diamond & Franklyn, *supra* note 124, at 2062 (arguing that reported cases underrepresent the role of surveys and that surveys often play an important role in pretrial litigation).

137. See Krista F. Holt & Scot A. Duvall, *Chasing Moseley's Ghost: Dilution Surveys Under the Trademark Dilution Revision Act*, 98 TRADEMARK REP. 1311, 1324–29 (2008) (describing the use of surveys to find mark dilution and distinctiveness under the Trademark Dilution Revision Act); Jerre B. Swann, *An Interdisciplinary Approach to Brand Strength*, 96 TRADEMARK REP. 943, 960–61, 973–74 (2006) (describing the use of surveys in evaluating mark strength using Adidas as an example). Some courts even draw adverse inferences from the absence of such evidence. See Beebe, *Empirical Study*, *supra* note 134, at 1641 ("Some circuits even apply an adverse inference of no likelihood of confusion if the plaintiff has the resources and time to produce survey evidence but fails to do so."); see also 2 MCCARTHY, *supra* note 36, § 12:14 ("Consumer surveys have become almost de rigueur in litigation over genericness."). This can be especially so when there has been a long period of simultaneous use of the plaintiff's and defendant's marks. *Id.* § 23:18 (quoting *Nabisco, Inc. v. PF Brands, Inc.*, 191 F.3d 208, 228 (2d Cir. 1999)).

138. James E. Ryan, *The Limited Influence of Social Science Evidence in Modern Desegregation Cases*, 81 N.C. L. REV. 1659, 1681–82 (2003) (comparing the use of surveys in trademark law with their nonuse in voluntary integration and affirmative action cases).

C. EVIDENCE

As its reliability increases, like survey evidence, neural indications of a trademark's acquired distinctiveness and consumer confusion are likely to be accepted into evidence in trademark cases. Consumer neuroscientists can claim a core professional competence lacked by judges. Instead of simply reflecting common sense, fMRI imaging offers evidence of consumer thought "in situations in which consumers are unlikely to say what they think, because they can't or they won't."¹³⁹ Rather than challenging an essential value in trademark law, neuroimaging's proponents can follow in the path of consumer surveys and promise a supplement for understanding consumer perception. The premium already placed on expert-led surveys of distinctiveness and confusion should favorably predispose courts to the admission of neuroscientific evidence on these issues.¹⁴⁰

One might question the need for neuroscientific evidence of acquired distinctiveness and confusion given the consumer behavioral studies that are already submitted to courts in the form of survey data.¹⁴¹ In fact, persistent reliability problems with survey evidence make a neuroscientific supplement desirable. Surveys requesting a consumer's verbal response to whether or not a symbol indicates the source of a product can be flawed and trigger misleading responses. A survey respondent may be prompted to view a mark that merely describes a product's qualities (e.g., COLD AND CREAMY for ice cream) as a source identifier from the call of the question rather than her own unbiased perception of the mark. For example, to ascertain acquired distinctiveness, surveys often present consumers with a descriptive mark and then immediately ask: "Does this [mark] identify any particular brands, products, or companies to you, or not?"¹⁴² One may wonder whether the respondent would have matched the

139. Uma R. Karmarkar et al., *Marketers Should Pay Attention to fMRI*, HARV. BUS. REV. (Nov. 3, 2015), <https://hbr.org/2015/11/marketers-should-pay-attention-to-fmri>.

140. See *supra* notes 133–38 and accompanying text.

141. This contention that brain imaging offers little beyond what behavioral studies already tell us is a common critique of neuroscience's utility in general. As Stephen Morse puts it, "Actions speak louder than images, EEG findings, or neuropsychological tests, behavioral genetics, or any of the other types of neuroevidence courts are confronted with." Stephen J. Morse, *Actions Speak Louder Than Images: The Use of Neuroscientific Evidence in Criminal Cases*, 3 J.L. & BIOSCIENCES 336, 340 (2016).

142. David H.B. Bednall et al., *Color, Champagne, and Trademark Secondary Meaning Surveys: Devilish Detail*, 102 TRADEMARK REP. 967, 977 (2012).

mark with any brand or product if not for the question's prompting. Similar concerns can limit the influence of survey evidence of consumer confusion.¹⁴³

By contrast, neuroimaging results offer the same benefit for courts assessing consumer perception that they do for market researchers: the promise of a consumer's unfiltered, immediate responses to an advertising stimulus, without falsehoods or answers that the respondent thinks the questioner wants to hear.¹⁴⁴ Brain scans do not even require a question to be asked. Test subjects can simply be shown the plaintiff's and defendant's marks and their resulting brain activity analyzed.¹⁴⁵ As a result, two sources of bias are seemingly ameliorated through neurological scans of consumers: that of consumers failing to reveal their "true" impressions of a mark and that of survey administrators, whether accidentally or by design, skewing the results through their interrogation of respondents.¹⁴⁶

Admittedly, both surveys and neurological scans of consumers can be attacked for not replicating real-world shopping conditions or for failing to sample individuals within the relevant purchasing class. To be probative, a consumer experiment must recreate the essential shopping experience.¹⁴⁷ And, for the most

143. See, e.g., *Kraft Foods Grp. Brands LLC v. Cracker Barrel Old Country Store, Inc.*, 735 F.3d 735, 741 (7th Cir. 2013) (explaining that confusion surveys "conducted by party-hired expert witnesses are prone to bias," including the "phrasing of questions in a way that is intended to elicit the surveyor's desired response—confusion or lack thereof—from the survey respondents").

144. See Dan Ariely & Gregory S. Berns, *Neuromarketing: The Hope and Hype of Neuroimaging in Business*, 11 NATURE REVIEWS 284, 284 (2010) (stating neuroimaging is desirable "based on the assumptions that people cannot fully articulate their preferences when asked to express them explicitly, and that consumers' brains contain hidden information about their preferences"); see also *supra* Part I.B.

145. See *id.* (describing how participants can simply be shown an advertisement while their brain is monitored).

146. This is not to say that neural imaging offers a perfect window into test subjects' thoughts. Although some studies successfully used fMRI imaging to identify when a research subject had been told to lie, other studies reveal that research participants can take simple countermeasures to defeat such veracity screenings. Martha J. Farah et al., *Functional MRI-Based Lie Detection: Scientific and Societal Challenges*, 15 NATURE REV. NEUROSCIENCE 123, 127 (2014). But neural imaging does allow for instantaneous recording of responses to commercial stimuli, a feature that arguably should contribute to more accurate readings of consumer sentiment than traditional survey evidence. See Rolando Grave de Peralta Menendez et al., *Electrical Neuroimaging Based on Biophysical Constrains*, 21 NEUROIMAGING 527, 528 (2004) (characterizing neuroimaging recording as "instantaneous").

147. See, e.g., *Smith v. Wal-Mart Stores, Inc.*, 537 F. Supp. 2d 1302, 1327 (N.D. Ga. 2008) ("To be valid for the purposes of demonstrating actual confusion

part, trademark law only concerns itself with likely purchasers of the items at issue.¹⁴⁸ Surveys that inaccurately reflect the marketplace or sample the wrong consumer universe may be declared inadmissible.¹⁴⁹ Yet if these concerns have not prevented all consumer surveys from being accepted into evidence, it is unlikely that they will prevent neuroimaging results from being accepted into evidence either. Indeed, as neural imaging technologies become more portable, it will become easier to simulate the shopping environments actually encountered by consumers.¹⁵⁰

Finally, it bears repeating that even flawed scientific techniques can find their way into the courtroom. I have tried to document the limitations to consumer neuroscience that might make one question its evidentiary role in trademark cases. Yet stacked against those limitations are precedent in trademark law for the admission of survey evidence of consumer perception, the growing use of neuroscience evidence in criminal law cases, and continuing investments and technological advances that will only increase the ability of neural imaging to shed light on consumer behavior.

D. DOCTRINE

In contrast to presenting evidence relevant to established legal doctrine (e.g., the presence of actual confusion among consumers or a defendant's sanity or lack thereof in determining mens rea in a criminal prosecution), social science research can also produce formal doctrinal change.¹⁵¹ We might consider this

in a trademark infringement suit, it is necessary for a survey's protocol to take into account marketplace conditions and typical consumer behavior . . .").

148. See, e.g., *id.* at 1325 ("The appropriate universe in this case is the consumers most likely to purchase [Plaintiff/Cross-Defendant]'s . . . merchandise.").

149. See, e.g., *id.* at 1325–26 ("Other courts have similarly criticized surveys . . . that failed to properly screen the universe to ensure that it was limited to respondents who were potential purchasers of the alleged infringer's product.").

150. See Arkadiusz Stopczynski et al., *The Smartphone Brain Scanner: A Portable Real-Time Neuroimaging System*, 9 PLOS ONE 1, 3–8 (2014) (utilizing smartphone-based neuroimaging technology as a portable research tool); see also *supra* notes 45–48. In fact, expert presentation of visual stimuli and corresponding neural reactions may be *less* prone to attack than text-based survey questions and reported reactions from consumers. Neuroscience advocates can point to their discipline's ability to sample consumer perception with reduced danger of research subjects providing misleading information, either because of a desire to misrepresent their own thoughts or an inability to communicate them.

151. Allowing in expert testimony as to facts in dispute can produce informal

as the doctrinal shaping function of psychological findings or as what John Monahan describes as the “social authority” function of social science research.¹⁵²

Admittedly, progress in the study of the human mind has not fundamentally altered legal doctrine, much to the chagrin of those working in the field of law and psychology. “Despite its long history, though, the law and psychology movement has not caused any real waves in the law,” bemoans one expert in the field.¹⁵³ Instead, there have been narrow areas of success where psychological insights have made their presence felt in the law. The same will likely be true of consumer neuroscience.¹⁵⁴ The law acts in a fundamentally conservative and opportunistic manner when it comes to psychology. As put colorfully by one psychologist and legal scholar, “The law uses psychology like a drunk uses a lamp post—more for support than illumination.”¹⁵⁵ Neural imaging will reshape the doctrines of distinctiveness, confusion, and dilution in trademark law, but in somewhat subtle ways likely to redound to the benefit of trademark holders.

1. Evaluating Distinctiveness

The ability to use neural imaging to determine if consumers have a memory of a particular consumer stimulus will likely provide new evidence relevant to assessing acquired distinctiveness. But what about determining inherent distinctiveness, i.e., whether a trademark communicates the source of goods to a consumer regardless of their prior experience with the trademark?

Better understanding of consumer thought could destabilize the tests developed to determine whether trademarks are inherently distinctive. Take, for example, the imagination test, which separates inherently distinctive “suggestive” marks from merely descriptive ones.

doctrinal changes. For example, the admission of survey evidence in trademark cases led to a more generous understanding of consumer confusion. See Bartholomew, *supra* note 126. Here, however, I am describing something different—research that causes legal frameworks to undergo *explicit* changes.

152. John Monahan & Laurens Walker, *Social Authority: Obtaining, Evaluating, and Establishing Social Science in Law*, 134 U. PA. L. REV. 477, 478 (1986).

153. James R.P. Ogloff, *Two Steps Forward and One Step Backward: The Law and Psychology Movement(s) in the 20th Century*, 24 LAW & HUM. BEHAV. 457, 464 (2000); see also Haney, *supra* note 112, at 151 (“Unlike other behavioral sciences, psychology has been slow to formalize its relationship with law.”).

154. See Ogloff, *supra* note 153, at 464–65 (listing areas psychology has failed to have a large impact).

155. *Id.* at 477.

[T]rademark doctrine presumes that consumers see suggestive marks as inherently distinctive because there is a weak connection between the mark selected and the product sold. The law presumes this weak connection leaves consumers with no choice but to make an ‘imaginative leap’ to connect the mark with the designated product.¹⁵⁶

In applying the imagination test, courts contend that certain words cause consumers to engage in a “multi-stage” or “inferential” reasoning process to determine a product’s attributes based on the mark at issue.¹⁵⁷ A trademark that forces a consumer to employ this kind of higher-order thought process is inherently distinctive. For example, an adjudicatory panel assumed that the mark BRIDAL KEEPSAFE for boxes that hold wedding gowns requires consumers to engage in this sort of advanced reasoning.¹⁵⁸ But, of course, the judges on the panel did not really know.

Ideally, fMRI readings would someday shed light on when consumers actually make a “mental leap from the mark to the product.”¹⁵⁹ As noted earlier, neuroscientists have identified neural correlates for specific mental states like feelings of loneliness and surprise.¹⁶⁰ At the same time, however, the complexity of higher-order thought processes eludes modern brain science, in part because these thought processes are so poorly understood. For example, there are no widely accepted neural measures for schizophrenia despite years of neuroscientific

156. Linford, *supra* note 33, at 1371. But this may not necessarily be the case. When confronted with a suggestive mark, the consumer may fail to make this leap, instead extracting different information from the word at issue. Many marks considered suggestive under the imagination test evoke desirable information about product qualities. *Id.* at 738–39. Linguistic theory reveals that the sounds of vowels and consonants in words convey meaning regardless of the literary definition (or lack thereof) in the word at issue. *Id.* at 734. For example, if asked to distinguish between two imaginary pieces of furniture, eighty percent of respondents believe that one named “Mal” will be bigger than one named “Mil.” *Id.* Keep this in mind the next time you go furniture shopping at IKEA. See Anne Quito, *The Secret Taxonomy Behind IKEA’s Product Names, From Billy to Poäng*, QUARTZ (Jan. 30, 2017), <https://qz.com/896146/how-ikea-names-its-products-the-curious-taxonomy-behind-billy-poang-malm-kallax-and-reus>.

157. See *Tumblebus Inc. v. Cranmer*, 399 F.3d 754, 763 (6th Cir. 2005) (citing *Induct-O-Matic Corp. v. Inductotherm*, 747 F.2d 358, 362 (6th Cir. 1984)); *Heartland Animal Clinic, P.A. v. Heartland SPCA Animal Med. Clinic, LLC*, 861 F. Supp. 2d 1293, 1300 (D. Kan. 2012).

158. *In re Cleaner’s Supply, Inc.*, No. 75/582,044, 2003 WL 169796, at *2 (T.T.A.B. Jan. 23, 2003).

159. *Marketquest Grp., Inc. v. BIC Corp.*, No. 11-CV-618 JLS (WMC), 2011 WL 5360899, at *7 (S.D. Cal. Nov. 7, 2011) (quoting *Brookfield Commc’ns, Inc. v. W. Coast Entm’t Corp.*, 174 F.3d 1036, 1058 (9th Cir. 1999)).

160. See sources cited *supra* note 68.

study of this particular mental disease.¹⁶¹ The mental gymnastics involved in assessing whether a consumer is engaging in a multi-stage reasoning process when ascertaining the role of a commercial symbol are too difficult to pinpoint using current technologies.¹⁶² This means that admissible neuroscientific evidence of inherent distinctiveness is unlikely, at least in the near term. Researchers are on safer ground when probing consumer memories to assess acquired distinctiveness.¹⁶³

2. Reweighing the Confusion Factors

Courts routinely caution that application of the likelihood of confusion factors is meant to be flexible and the weight given to any particular factor can adjust to the circumstances of each case.¹⁶⁴ The unsettled state of the factors offers opportunity for doctrinal change. Neuroscience may influence how infringement is calculated by placing a greater premium on direct evidence of confusion. Some of the likelihood of confusion factors (actual confusion and mark strength) are likely to take on more salience when amplified by neurological measurement. Others (similarity of the marks, relatedness of goods or services, and defendant's intent) will probably decline in importance.

As consumer neuroscience develops, the actual confusion factor may become more important to the likelihood of confusion analysis. Already, the direct nature of actual confusion evidence, as opposed to the indirect evidence that comprises the rest of the likelihood of confusion factors, exerts a strong pull on judges. As stated by the Fifth Circuit, “[t]here can be no more positive or substantial proof of the likelihood of confusion than proof of actual confusion.”¹⁶⁵ Consumer neuroscientists can see what a consumer's brain looks like when it views a particular trademark,

161. WILLIAM R. UTTAL, *MIND AND BRAIN: A CRITICAL APPRAISAL OF COGNITIVE NEUROSCIENCE* 368 (2011).

162. *See id.* (describing why modern technology is unable to directly observe cognitive processes, either because of overflow of information in the case of EEGs or because of excess pooling of information for fMRIs).

163. *See supra* Part I.B.1; *see also* Chen et al., *supra* note 18, at 455 (referring to memory as a relatively “basic cognitive process”).

164. *See* *Sullivan v. CBS Corp.*, 385 F.3d 772, 778 (7th Cir. 2004) (stressing that the factors “operate only as a heuristic device to assist in determining whether confusion exists”); *Dreamwerks Prod. Grp., Inc. v. SKG Studio*, 142 F.3d 1127, 1129 (9th Cir. 1998) (“The factors should not be rigidly weighed; we do not count beans.”).

165. *World Carpets, Inc. v. Dick Littrell's New World Carpets*, 438 F.2d 482, 489 (5th Cir. 1971). Although artificial constructs, consumer surveys are typically classified as “actual confusion” evidence. *See, e.g.*, *Water Pik, Inc. v. Med-*

and they can potentially look for the same pattern when consumers see an allegedly infringing mark.¹⁶⁶ At the level of doctrine, the admission of such evidence is likely to make the actual confusion factor loom even larger in the judicial imagination.

The mark strength factor will take on greater weight in the likelihood of confusion analysis as well. Every federal court assesses the strength of the plaintiff's mark as part of its calculation of whether consumers are likely to be confused by the defendant's actions.¹⁶⁷ Mark strength is a question of distinctiveness: the more strength a mark has, the "more consumers who use the mark as a source identifier."¹⁶⁸ Consumer neuroscientists are getting more skilled at being able to measure the ability of brands to capture attention and remain in memory.¹⁶⁹ Mark strength is already central to likelihood of confusion.¹⁷⁰ It may become even more important once it appears susceptible to direct measurement through fMRI and EEG readings.

By contrast, other parts of the confusion analysis that do not offer a direct measurement of actual consumer perception may recede in importance once images and data from neural scans are admitted into evidence. It makes eminent sense to consider mark similarity and relatedness of goods in evaluating the potential for confusion. But courts have wrestled for decades with the degree of similarity and relatedness needed to confuse consumers. In applying these factors, the trier of fact is placed in

Sys., Inc., 726 F.3d 1136, 1144 (10th Cir. 2013) (evaluating a party's consumer survey for "evidence of actual confusion").

166. See *supra* Part I.B.2.

167. 2 MCCARTHY, *supra* note 36, § 11:73 ("All courts agree that 'stronger' marks are given 'stronger' protection . . .").

168. Bone, *supra* note 16, at 1346. In determining mark strength, courts actually consider two things. The more distinctive the mark, the greater strength it is considered to have and the less likelihood there is of confusion. *Id.* Hence, the court's previous analysis of distinctiveness is imported into the likelihood of confusion analysis. Courts also consider a mark's "market strength," relying on many of the factors one reviews in an analysis of secondary meaning (e.g., total sales, amount spent on advertising). *Id.*; see, e.g., *Bridgestone Ams. Tire Operations, LLC v. Fed. Corp.*, 673 F.3d 1330, 1336 (Fed. Cir. 2012) (evaluating market strength of a mark based partially on sales and advertising expenses). Hence, to the extent neuroscientific evidence alters the distinctiveness analysis, it will alter the mark strength calculation as well.

169. See *supra* Part I.B.2.

170. See Beebe, *Empirical Study*, *supra* note 134, at 1633–34 ("[I]n opinions that do address the issue of trademark strength, and inherent strength in particular, there is a surprisingly good correlation between inherent strength and success in the multifactor test.").

the uncomfortable position of trying to channel consumer thought. It takes a certain amount of chutzpah for one person in black robes to decide whether consumers will perceive the “Burgatory” and “Burger Story” marks similarly. Although some courts seem to have great faith in their ability to make this sort of judgment,¹⁷¹ others are less sanguine. As one court noted: “the most successful form of copying is to employ enough points of similarity to confuse the public with enough points of difference to confuse the courts.”¹⁷² Already mistrustful of their own guesses as to which mark resemblances strike too close to home, courts may be even less tempted to rely on these guesses when they can place their faith in tangible neural evidence of actual confusion.

The confusion factor most likely to suffer from trademark law’s neural turn is the defendant’s intent. As neural evidence of confusion becomes more compelling, intent’s role as a proxy for infringement seems likely to wane.¹⁷³ Arguably, intent is indirectly relevant to confusion because of the probability that a defendant who wants to sow the seeds of trademark confusion will be successful in doing so. But this is a very speculative justification. Just because the defendant intends to confuse consumers, there is no reason to believe that the defendant will accomplish its intended goal. As direct neuroscientific evidence of actual confusion and mark strength makes those factors appear more reliable, the unreliable nature of the defendant’s intent factor will stand out even more.¹⁷⁴

171. For example, Judge Easterbrook of the Seventh Circuit compared two cans of tobacco products, concluded that “no one who saw these cans side by side could be confused about who makes which,” and disclaimed any interest in “traips[ing] through the list” of likelihood of confusion factors. *Top Tobacco, L.P. v. N. Atl. Operating Co.*, 509 F.3d 380, 381, 383 (7th Cir. 2007).

172. *Baker v. Master Printers Union*, 34 F. Supp. 808, 811 (D.N.J. 1940).

173. Some already call for eliminating intent from the likelihood of confusion analysis. See Thomas L. Casagrande, *A Verdict for Your Thoughts? Why an Accused Trademark Infringer’s Intent Has No Place in Likelihood of Confusion Analysis*, 101 TRADEMARK REP. 1447, 1471–75 (2011) (arguing that consideration of intent should be limited to equitable issues).

174. As I have argued in other work, the intent factor reflects a moral standard rather than a genuine attempt to predict consumer perceptions. Mark Bartholomew, *Trademark Morality*, 55 WM. & MARY L. REV. 85, 115 (2013). Yet the modern justification for trademark protection is so focused on protecting consumers that courts no longer feel comfortable openly verbalizing the moral imperative that often shapes their interpretation of the intent factor. As a result, I would expect concerns over defendant intent to remain at play in trademark law, but to be even more submerged, sometimes steering interpretation of other factors, but not explicitly.

3. A Growing Role for Trademark Dilution

Trademark dilution requires a demonstration of one of two different mental phenomena. “Dilution by blurring” demands proof that the similarity between the defendant’s and plaintiff’s marks is likely to impair the distinctiveness of the plaintiff’s mark.¹⁷⁵ “Dilution by tarnishment” necessitates a showing that an association is likely to arise between the defendant’s and plaintiff’s marks that “harms the reputation” of the plaintiff’s mark.¹⁷⁶ Like the distinctiveness and infringement inquiries, dilution doctrine depends on a series of judicial speculations about consumer cognition.

Much like the likelihood of confusion analysis, the dilution by blurring analysis requires courts to march through a set of factors. As with likelihood of confusion, courts are likely to place increased weight on those factors that appear susceptible to direct neural proof. For example, one factor is the existence of “any actual association” between the plaintiff’s and the defendant’s marks.¹⁷⁷ Determining what constitutes proof of actual association has long bedeviled courts hearing dilution cases. Dilution represents a subconscious, spontaneous process that can be hard to measure through the considered responses of survey participants.¹⁷⁸ In the future, however, association evidence could come in the form of neuroscientific studies where consumers were exposed to the defendant’s mark and then scrutinized for evidence of brain activity matching the encoding of the plaintiff’s mark. Such evidence would seem to avoid a frequent criticism of survey evidence: respondents’ inability to say what they really think.¹⁷⁹

175. 15 U.S.C. § 1125(c)(2)(B) (2012).

176. *Id.* § 1125(c)(2)(C).

177. *Id.* § 1125(c)(2)(B)(vi).

178. See Shari Seidman Diamond, *Surveys in Dilution Cases II*, in TRADEMARK AND DECEPTIVE ADVERTISING SURVEYS: LAW, SCIENCE, AND DESIGN 155, 157–62 (Shari Seidman Diamond & Jerre B. Swann eds., 2012) (discussing the difficulties of producing surveys that measure spontaneous association and assess whether association is likely to impair distinctiveness of a mark). The problem is that this evidence often seems to beg the question. For example, a court credited a survey finding that eighty-seven percent of respondents said “Nike” when asked “What if anything, came to your mind when I first said the word Nikepal?” as evidence of actual association. *Nike, Inc. v. Nikepal Int’l, Inc.*, No. 2:05-CV-1468-GEB-JFM, 2007 WL 2782030, at *4 (E.D. Cal. Sept. 18, 2007). One might object that, rather than revealing actual consumer perception, such a question predisposes respondents to find an association.

179. Perhaps recognizing the difficulty in finding proof of actual association, courts accept testimony from isolated individuals who claim that seeing the defendant’s mark made them think of the famous mark. One court held that a single person’s testimony that the store name “Victor’s Little Secret” made him

With better direct evidence of association, the “actual association” factor might assume the same importance that the “actual confusion” factor already does in the likelihood of confusion analysis.¹⁸⁰

But consumer neuroscience’s largest doctrinal impact may be in the way it changes the cause of action for dilution by tarnishment. It is impossible to assess whether a mark’s reputation has been harmed without establishing a baseline for what that reputation is. Courts in dilution cases have responded to this difficulty by limiting the dilution by tarnishment cause of action to use of the famous mark with sex, drug, and nudity-related products.¹⁸¹ Use of a famous mark in products involving sex or nudity, according to the courts, triggers negative connotations in

think of plaintiff’s VICTORIA’S SECRET mark was probative evidence of actual association. *V Secret Catalogue, Inc. v. Moseley*, 558 F. Supp. 2d 734, 747–48 (W.D. Ky. 2008). Similarly, other courts have found anonymous Twitter posts or an email from a single consumer to be compelling evidence of actual association. *Louis Vuitton Malletier, S.A. v. Hyundai Motor Am.*, No. 10 Civ. 1611(PKC), 2012 WL 1022247, at *11 (S.D.N.Y. Mar. 22, 2012) (using Twitter posts); *N.Y.C. Triathlon, LLC v. NYC Triathlon Club, Inc.*, 704 F. Supp. 2d 305, 319, 338 (S.D.N.Y. 2010) (using email). A representative sample of consumer brain activity should be more persuasive evidence of association than the impressions of isolated individuals.

180. One could argue that neuroscientific evidence will make courts more skeptical of the entire dilution analysis. For example, according to the federal dilution statute, if the plaintiff’s mark exhibits a high degree of distinctiveness and recognition, dilution by blurring is more likely. 15 U.S.C. § 1125(c)(2)(B) (2012). Proof of distinctiveness and recognition shows that a plaintiff has a lot to lose from the dilutive activities of other actors, but does it really correlate with blurring? It is possible that highly distinctive or recognized marks are *more* resistant to dilution by other actors, not less. See Paul J. Heald & Robert Brauneis, *The Myth of Buick Aspirin: An Empirical Study of Trademark Dilution by Product and Trade Names*, 32 CARDOZO L. REV. 2533, 2574–75 (2011) (speculating that supposedly dilutive uses can actually “reaffirm the famous mark in consumers’ minds”); *id.* at 2573 (noting that the “most well-known brands” are particularly resistant to dilution). It may be that consumers have built up such a strong mental map of what famous brands like COKE or LOUIS VUITTON mean that this impression is unlikely to be shaken by the activities of outside actors. See Barton Beebe et al., *Testing for Trademark Dilution in Court and in the Lab*, 86 U. CHI. L. REV. (forthcoming 2019) (manuscript at 6–7), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2960082 (contending that the only existing empirical studies claiming to show that dilution occurs are invalid, leading the authors to question whether dilution even exists). Consumer neuroscience studies could prove or disprove this theory, potentially making dilution by blurring a possibility for some well-known brands but not for the most famous brands of all. I think that such a path for consumer neuroscience evidence is unlikely, however. At this point, we have left Kalven’s middle range and are coming close to psychological evidence eviscerating the dilution cause of action altogether.

181. Irina D. Manta, *Hedonic Trademarks*, 74 OHIO ST. L.J. 241, 248 n.27

consumers' brains.¹⁸² Other products do not.¹⁸³ The rationale seems to be that even if harm to reputation cannot be measured, it can be presumed because of the assumed power of sexual imagery to shape our thinking.¹⁸⁴

Dilution by tarnishment has been not only difficult to define, but also difficult to measure, which may be one reason for the doctrinal fixation on sexually-related mark uses and a refusal to countenance a variety of other potentially tarnishing conduct. If neuroscience makes brand reputation more transparent, however, that could change. Brain mapping that defines a unique brand personality existing in consumers' heads could establish a reputational baseline.¹⁸⁵ Subsequent changes to this baseline after exposure to the defendant's mark could be cited as evidence of tarnishment. For example, a consumer neuroscience expert might demonstrate that VOLVO stands for safety in a substantial percentage of consumers' minds and that the neural signature for safety diminishes after the introduction of VOLVO chainsaws.

For some, using neuroscience to assess brand reputation might sound fantastic. It would seem that the complex web of associations we form over the course of our lives in relation to one particular commercial symbol would be difficult to neurologically test and vary widely from person to person. Yet finding generalizable neural associations for particular brand attributes is exactly what consumer neuroscientists claim to be able to do. By examining not just localized neural activity, but "correlated activity across a network of brain areas," researchers discovered "highly distinctive associations," even among similar brands like

(2013).

182. One federal circuit even goes so far as to create a full-fledged rebuttable presumption that sex-related products are "likely to tarnish a famous mark if there is a clear semantic association between the two." *V Secret Catalogue, Inc. v. Moseley*, 605 F.3d 382, 385 (6th Cir. 2010).

183. Jordana S. Loughran, Note, *Tarnishment's Goody-Two-Shoes Shouldn't Get All the Protection: Balancing Trademark Dilution Through Burnishment*, 21 LEWIS & CLARK L. REV. 453, 484 (2017) ("[C]ourts have construed the [dilution by tarnishment] claim narrowly to include only associations with sex, drugs, or nudity.").

184. Perhaps this presumption is accurate, but we cannot be sure. One non-neuroscientific study, which involved exposing subjects to posters of pornographic versions of popular movies and questioning them about their perception of the original films, found no evidence of tarnishment. Christopher Buccafusco et al., *Testing Tarnishment in Trademark and Copyright Law: The Effect of Pornographic Versions of Protected Marks and Works*, 94 WASH. U. L. REV. 341, 388 (2016).

185. See *supra* Part I.B.3.

Apple and Microsoft.¹⁸⁶ Perhaps even more impressive, these neural measurements of brand personality traits stayed relatively constant across samples from different populations with “different demographic and socioeconomic characteristics.”¹⁸⁷ Researchers have not yet used neuroscientific tests to determine how marketing actions affect “the mental map of brand personality,” but they describe such inquiries as “a natural next step.”¹⁸⁸ With the ability to see tangible signs of mark reputation in consumers’ brains, courts may be emboldened to recognize tarnishment from more than just sexualized uses of a plaintiff’s famous mark. Gradually adding to the small list of potentially tarnishing product areas would not eliminate a cause of action or fundamentally remake dilution law. Instead, it would be a discrete expansion, falling into Kalven’s middle range where judges allow psychology to shape legal doctrine.

To summarize, consumer neuroscience could soon change trademark adjudications in a number of ways. When it comes to evidence, courts appear likely to admit neuroscientific studies of acquired distinctiveness and confusion in the near future. Doctrinally, the neuroscientific turn may cause courts to privilege likelihood of confusion factors susceptible to direct neural evidence though current technological limitations make changes to the tests for inherent distinctiveness unlikely. Perhaps most significantly, by promising a biological measurement of mark reputation, neural scans will open the door to broader recognition of dilution by tarnishment beyond unauthorized uses relating to sex. The next Part examines whether any of these predicted changes would actually be good for trademark law.

III. HOW TRADEMARK LAW SHOULD ADAPT TO NEUROSCIENCE

This Article contends that trademark law’s distinctiveness, confusion, and dilution analyses will change under the influence of consumer neuroscience. My hope is that these changes will not be accepted passively, but rather courts and legislators will reconsider what they mean by these legal terms as neuroscience begins to alter their character. The dominant rationale for trademark protection—the reduction of consumer search costs—is an inadequate normative guide for such a reconsideration. It offers

186. Chen et al., *supra* note 18, at 454, 459.

187. *Id.* at 459.

188. *Id.* at 463.

no logical stopping point when determining the importance of small changes in consumer perception as revealed through fMRI and EEG readings. Here, I offer a different principle—focusing judicial attention on consumers’ cognitive responses, not their emotional ones—to help steer trademark jurisprudence through a new technological chapter.

A. THE NEED FOR FIRST PRINCIPLES

As one psychologist notes in tracing the history of psychology and American law, “experts and their techniques are expensive and in the long run what they do will benefit whichever side commands the greatest resources.”¹⁸⁹ Although gradually declining in cost, the techniques of neuroscience can be prohibitively expensive, leading to alliances between researchers and advertisers.¹⁹⁰ It is no accident that one of the focal points in neuroscientific research is studying how to make famous trademarks even more important to consumer decision making.¹⁹¹ It is well-established brands, not upstarts, that are devoting resources to neuromarketing and related neuroscientific study of consumers. Fortune 500 companies regularly hire businesses like the Nielsen Company to run brain scans on prospective purchasers.¹⁹²

What do the brands guiding consumer neuroscience research want for their money? Of course, they want to understand prospective shoppers better so that they can engineer more effective sales pitches. But when neuroscientific evidence is introduced in court, these mark holders will want to reinforce a view of consumers as hurried and easily confused. This view of the

189. Haney, *supra* note 112, at 154.

190. Consumer neuroscience is becoming ingrained in academia. As psychology departments and medical schools invest in neurotechnology, MBA students take neuromarketing classes. Institutions of higher learning routinely allow businesses to use their brain imaging equipment (for a hefty fee) to perform applied market research. Meanwhile, private organizations like eBay and the National Association of Securities Dealers hire university neuroscientists to scan representative members of their clientele and neuromarketing firms recruit respected scientists to serve on their corporate boards. SATEL & LILIENTHAL, *supra* note 28, at ix; ZACK LYNCH, *THE NEURO REVOLUTION: HOW BRAIN SCIENCE IS CHANGING OUR WORLD* 49–56 (2009); R. Mark Wilson et al., *Neuromarketing and Consumer Free Will*, 42 J. CONS. AFFAIRS 389, 393 (2008).

191. See *supra* Part I.B; see also ERIK DU PLESSIS, *THE BRANDED MIND: WHAT NEUROSCIENCE REALLY TELLS US ABOUT THE PUZZLE OF THE BRAIN AND THE BRAND* 133–34 (2011) (discussing the growing role of neuroscience in marketing as well as reasons why its adoption has been somewhat gradual).

192. Adam L. Penenberg, *NeuroFocus Uses Neuromarketing to Hack Your Brain*, FAST COMPANY (Aug. 8, 2011), <https://www.fastcompany.com/1769238/neurofocus-uses-neuromarketing-hack-your-brain>.

consumer as a “moron in a hurry”¹⁹³ makes it easier to win trademark infringement verdicts and stop rival businesses. Whether use of a term is actually confusing to consumers or not, there is a strategic gain for mark holders in engineering a broad definition of consumer confusion to estop the advertising activities of competitors.¹⁹⁴

The incentives also align with research that will make it easier to demonstrate mark distinctiveness and dilution. When speaking to non-legal audiences, neuromarketing specialists stress the importance of maintaining control over aspects of the marketing environment discovered to have particular resonance in consumers’ minds.¹⁹⁵ Businesses will want the law to make it easier for them to claim ownership of particular words, even when those words appear more descriptive of product characteristics than product source. They will also endorse research supporting a broader tarnishment doctrine, one that protects the emotional meanings designed for famous brands from more than just unauthorized sexualized uses.¹⁹⁶

The story of psychologist-sponsored trademark surveys offers a cautionary example about the effects of scientific innovation on trademark law.¹⁹⁷ The introduction of survey evidence benefitted trademark holders by making confusion easier to prove. Psychological research of the early twentieth century emphasized consumers’ limited intellectual capabilities. Judges ended up trading earlier views of a cautious and logical consuming public for a description of that public as “that vast multitude which includes the ignorant, the unthinking and the credulous, who, in making purchases, do not stop to analyze, but are governed by appearances and general impressions.”¹⁹⁸ These

193. *Morning Star Coop. Soc’y Ltd. v. Express Newspapers Ltd.* [1979] EWHC (Ch) 113 [117] (Eng.).

194. See Ann Bartow, *Likelihood of Confusion*, 41 SAN DIEGO L. REV. 721, 722 (2004) (“In the context of trademark litigation, trademark holders aggressively assert that consumers are extremely easy to confuse because judicial acceptance of this assumption facilitates victory in trademark infringement suits.”).

195. See, e.g., PATRICK M. GEORGES ET AL., *NEUROMARKETING IN ACTION: HOW TO TALK AND SELL TO THE BRAIN* 91 (2014) (emphasizing the importance of controlling all of the customer’s sensory inputs).

196. See, e.g., A.K. PRADEEP, *THE BUYING BRAIN: SECRETS FOR SELLING TO THE SUBCONSCIOUS MIND* 123 (2010) (discussing the need for companies to identify the “attributes of form” of their category of product, their product, and their competitor’s product in order to protect them using trademark law).

197. See *supra* Part II.B.

198. *Florence Mfg. Co. v. J.C. Dowd & Co.*, 178 F. 73, 75 (2d Cir. 1910).

changes in legal doctrine, spurred by an embrace of the science of psychology, strengthened the hand of advertisers. By making it easier to assert trademark rights in merely descriptive terms and to demonstrate that consumers would be confused by alternative uses of those terms, courts turned trademarks into more powerful business resources, encouraging further investment in psychological techniques designed to burnish their emotional resonance with consumers.¹⁹⁹

One might object that consumer neuroscience need not favor trademark plaintiffs and that courts can only go where the evidence takes them. But science is not value-neutral.²⁰⁰ Reading fMRI results requires interpretation, and there will be consequences from interpreting brain images one way instead of another. The concern is that judges and lawmakers may not appreciate this. Even those excited about integrating neuroscientific evidence with legal doctrine caution against an “fMRI fetishism” that causes adjudicators to be more persuaded by this evidence than warranted and to fail to consider the implications of neuroscientific evidence in light of the underlying justifications behind different legal regimes.²⁰¹ Moreover, once a new technology for tracking human behavior secures a place in legal doctrine or practice, it can become impossible to displace. Despite evidence showing the unreliability of much of forensic science, including ballistics tests and the matching of latent fingerprints, such evidence has become a bedrock of the American criminal justice system.²⁰²

Because history counsels that a better understanding of the brain means more evidence favorable to trademark holders, it is important that, from the outset, courts assess the influence of

199. See BARTHOLOMEW, *supra* note 95, at 111.

200. See Solon Barocas & Andrew Selbst, *Big Data's Disparate Impact*, 104 CALIF. L. REV. 671, 677 (2016).

201. See Shen, *supra* note 6, at 1051; see also David P. McCabe & Alan D. Castel, *Seeing Is Believing: The Effect of Brain Images on Judgments of Scientific Reasoning*, 107 COGNITION 343, 350–52 (2008) (showing that brain scans can cause potential jurors to accept flawed explanations of mental phenomena).

202. Epstein, *supra* note 92, at 605–07 (discussing the widespread use and unreliability of latent fingerprint matching); Adina Schwartz, *A Systemic Challenge to the Reliability and Admissibility of Firearms and Toolmark Identification*, 6 COLUM. SCI. & TECH. L. REV. 2, 3 (2005) (contending that “all firearms and toolmark identification testimony should be excluded until adequate statistical empirical foundations and proficiency testing are developed for the field”); *Last Week Tonight with John Oliver: Forensic Science* (HBO television broadcast Oct. 1, 2017) (chronicling flaws in forensic science, including fingerprinting and DNA matching).

consumer neuroscientific evidence against a normative guide. Trademark law has a single dominant first principle: the reduction of consumer search costs.²⁰³ But this single principle is inadequate to assess the consequences of making it easier to prove mark distinctiveness, confusion, and dilution through neural imaging.

B. THE INADEQUACY OF THE SEARCH COSTS JUSTIFICATION

The elimination of search costs serves as the guiding justification for modern trademark law. The search costs theory goes like this. Unauthorized trademark usage forces consumers to spend valuable time and effort to scrutinize advertising representations. If I see an advertisement for a tablet computer featuring the “Apple” name yet coming from a different entity than the Cupertino, California-based electronics colossus, I have to waste my limited cognitive and temporal resources evaluating the advertisement more closely than I would otherwise. Even if I do not end up purchasing the product under the mistaken assumption that it comes from the Cupertino company, I will still have to scrutinize this commercial representation more heavily than if such an unauthorized use of the Apple mark was simply prohibited. Saving me from this wasted effort has become trademark law’s prime directive. “[I]t would be nearly impossible to overstate the extent to which the search costs theory now dominates as the theoretical justification of trademark law.”²⁰⁴

203. Mark P. McKenna, *A Consumer Decision-Making Theory of Trademark Law*, 98 VA. L. REV. 67, 75 (2012).

204. *Id.* Courts did not always have such an overriding focus on preventing confusion and supposedly thereby enhancing consumer efficiency. Instead, values separate from consumer protection once informed judicial decision-making in this area. One primary value was the need to protect producer goodwill; culpable defendants were viewed as free-riders. William McGeeveran & Mark P. McKenna, *Confusion Isn't Everything*, 89 NOTRE DAME L. REV. 253, 260 n.24 (2013). This emphasis on trade diversion was problematic as well. It articulated a view of trademarks grounded in property rights rhetoric and was not sensitive to alternative concerns like consumer welfare, monopoly power, and free expression. Linford, *supra* note 33, at 1374 n.33. But, at least when practiced by courts in the late nineteenth and early twentieth centuries, the trade diversion rationale was cabined by advertising practice, which largely concerned itself with indicating the source of goods. Sonia Katyal, *Trademark Intersectionality*, 57 UCLA L. REV. 1601, 1619 (2010). Compared to today’s practice of imbuing brands with deep emotional value, the stakes were lower when trademarks only served as a traffic sign informing consumers where prospective goods came from. Meanwhile, courts restricted trademark law’s scope to actions by direct competitors. McGeeveran & McKenna, *supra* at 261. This helped avoid adjudications that might implicate broader speech or competition concerns. *Id.*

If search costs are the primary lens for interpreting consumer neuroscience's entry into trademark law, some changes stemming from trademark law's impending neural turn appear salutary. Additional proof of acquired distinctiveness could help courts make more accurate judgments as to whether a word or symbol actually signals source to consumers. In this way, neuroscience might help reduce the danger of trademark false positives: trademark protection for marks that do not actually indicate source, which block competitors from effectively communicating with consumers while doing little to ease shoppers' cognitive burdens.²⁰⁵

Similarly, by focusing more attention on likelihood of confusion factors that could be tethered to neural data of consumer perception (like mark strength and actual confusion), neuroscience promises to better reconstruct consumer thought processes. That is arguably a good thing as well. A more accurate read of consumer confusion helps prevent unauthorized uses that send deceptive signals into the marketplace. From the search costs perspective, shoppers will be saved from spending unnecessary cognitive energy on carefully scrutinizing the origins of their prospective purchases.²⁰⁶

Yet there are drawbacks to simply evaluating the implications of consumer neuroscience in trademark law according to the search costs model. At least at first, importing neuroscientific evidence into trademark law could create a trademark regime of haves and have nots.²⁰⁷ We have already seen a version

205. See Linford, *supra* note 33, at 1374–75. Consumer neuroscience could have an even more positive impact if it could inform the judicial tests for inherent distinctiveness. For example, as noted earlier, courts seize on double entendres as proof that a mark serves as a source identifier. See *supra* note 34 and accompanying text. The courts considering SUGAR & SPICE for baked goods and L'EGGS for pantyhose maintained that, because they were double entendres, these marks trigger multiple thoughts, including thoughts about source (and not just product qualities), in consumers' heads. *Sara Lee Corp. v. Kayser-Roth Corp.*, 81 F.3d 455, 465 (4th Cir. 1996); *Application of Colonial Stores Inc.*, 394 F.2d 549, 552–53 (C.C.P.A. 1968). Alexandra Roberts disagrees, contending that “double entendres are indicia of mark owner creativity, not consumer perception.” Roberts, *supra* note 15, at 1062. At this stage, however, the technology cannot shed much light on complex, ill-defined mental constructs like whether a double entendre triggers thoughts about source. See *supra* Part I.B.1.

206. See McKenna, *supra* note 203, at 73–81 (describing the search cost theory).

207. Even if courts do begin to accept neural evidence of mark distinctiveness, poorer litigants might urge the continued use of judicially-derived tests for inherent distinctiveness at the initial stage of a trademark litigation or prosecution for quick, efficient disposition of some cases.

of this with judicial presumptions against those who do not pay for survey evidence.²⁰⁸ Although the costs of neural imaging are decreasing, they still represent a significant expense for would-be litigants.²⁰⁹ Smaller companies seeking to challenge the distinctiveness of a larger rival's mark or defending themselves from an infringement claim may be forced to capitulate rather than suffer the expense of hiring a competing neuroscientific expert. If search costs remain the lodestar for courts assessing trademark infringement, a desire to prevent any confusion among consumers may further tilt an already unequal playing field in favor of deep-pocketed companies that can marshal the resources for neuroscientific evidence purporting to lay bare those search costs.²¹⁰

More importantly, there are different scenarios where consumers may be considered confused and not all of them should give rise to an action for trademark infringement. Confusion is not just an empirical question, but a normative one as well.²¹¹ The search costs justification offers no logical stopping point for a court trying to assess how much confusion is too much. For example, some courts have recognized "initial interest confusion," whereby a consumer first perceives a product as coming from the plaintiff but then quickly recognizes that the product actually comes from the defendant.²¹² Take the situation where a keyword search using a trademark on Google or Bing turns up a competitor's website instead of the trademark holder's, momentarily distracting the consumer before a purchase has been made. The courts have struggled with these scenarios, sometimes finding confusion, even though the confusion quickly dissipates upon reaching the competitor's website and consumers

208. See *supra* note 137.

209. See Baskin-Sommers & Fonteneau, *supra* note 88, at 424.

210. Eventually, the costs of neuroscientific testing of consumers will likely come down, allowing different kinds of market actors to take advantage of fMRI and EEG readings. See, e.g., Gary Boas, *Low-Cost, High-Performance MRI Opens New Opportunities for Brain Imaging*, MARTINOS CTR. NEWS. (Oct. 15, 2015), <https://www.nmr.mgh.harvard.edu/news/20151015/low-cost-high-performance-mri-opens-new-opportunities-brain-imaging>. At that point, however, precedents friendly to famous brand holders may be cemented into place. Cf. Oona A. Hathaway, *Path Dependence in the Law: The Course and Pattern of Legal Change in a Common Law System*, 86 IOWA L. REV. 601, 638 (2001) (arguing that law is constrained by the circumstances under which it arises and does not always result in the best or most efficient solution).

211. Deven R. Desai, *From Trademarks to Brands*, 64 FLA. L. REV. 981, 987 (2012).

212. See, e.g., *Australian Gold, Inc. v. Hatfield*, 436 F.3d 1228, 1239 (10th Cir. 2006).

arguably benefit from exposure to more product choices when competitors can use rival brands as keyword search terms.²¹³

Today's neural readers can detect fleeting changes in blood flow that last less than a second.²¹⁴ The question for courts will be if an evanescent detection of confusion should dictate a finding of infringement. As the financial backers of consumer neuroscience strive to uncover more and more precise measurements of consumer confusion in the laboratory, evidence showing momentary confusion will be available to courts deciding trademark cases. Under the search costs theory, such evidence would be compelling proof of infringement.²¹⁵

Along similar lines, the search costs theory has been mobilized to justify trademark dilution. According to some, consumers experience so-called "internal search costs" when a familiar brand name is presented in a new context.²¹⁶ To take one recent case, consumers may not be confused by the bawdy songs of a rapper named "Rolls Royce Rizzy" such that they would think the rapper formally partnered with the luxury car maker.²¹⁷ But the disjunction between the rapper's use of the famous brand and the car maker's upper crust reputation might cause a momentary double take—an "internal search cost"—inside their

213. See *Nissan Motor Co. v. Nissan Comput. Corp.*, 378 F.3d 1002, 1018 (9th Cir. 2004); *Brookfield Commc'ns, Inc. v. W. Coast Entm't Corp.*, 174 F.3d 1036, 1061–65 (9th Cir. 1999).

214. Seiji Ogawa et al., *An Approach to Probe Some Neural Systems Interaction by Functional MRI at Neural Time Scale Down to Milliseconds*, 97 PROC. NAT'L ACAD. SCI. 11026, 11026 (2000).

215. See Stacey L. Dogan & Mark A. Lemley, *Trademarks and Consumer Search Costs on the Internet*, 41 HOUS. L. REV. 777, 814 (2004) (describing case where momentary confusion was sufficient for infringement); McKenna, *supra* note 203, at 79 ("The search costs theory, at least as it has been widely understood by both courts and scholars, sees reduction of search costs as an end in itself."). This is not to say that courts evaluating search costs never balance these costs against competing interests. Sometimes even when a defendant's activity momentarily confuses consumers, a judge will acknowledge that expressive concerns or competitive harms, on balance, are more important than shopper efficiency. See, e.g., *Lamparello v. Falwell*, 420 F.3d 309, 315–18 (4th Cir. 2005). The problem is that trademark law offers little in the way of a developed framework for weighing these competing interests, making it all too easy for search costs to take center stage in the judicial imagination.

216. Tushnet, *supra* note 23, at 509; see also WILLIAM LANDES & RICHARD POSNER, *THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW* 168, 207 (2003) (describing "imagination cost"); Jacob Jacoby, *The Psychological Foundations of Trademark Law: Secondary Meaning, Genericism, Fame, Confusion, and Dilution*, 91 TRADEMARK REP. 1013, 1047 (2001) (describing the "blurring of the mental associations evoked by [a] mark").

217. *Rolls-Royce Motor Cars Ltd. v. Davis*, No. 15–0417 (KM), 2016 WL 3913640, at *2 (D.N.J. Mar. 11, 2016).

heads. Prior studies, not dependent on neuroscience, supposedly showed that dilutive uses of a famous brand name (e.g., HEINEKEN popcorn) caused consumers to take a few hundred milliseconds longer to recall the famous brand than if they had never been exposed to the dilutive stimulus.²¹⁸ Rebecca Tushnet maintains that such meagre impacts on consumer recall should be considered insufficient to demonstrate a legally-cognizable harm, particularly given the countervailing expressive interests of dilution defendants.²¹⁹ Under the search costs theory, however, one could argue that the consumer should be protected from even a few hundred milliseconds of cognitive consternation.²²⁰ These moments of consumer bewilderment would become easier to prove upon the admission of fMRI and EEG readings.²²¹

C. ENCOURAGING CONSUMER DELIBERATION

If the search costs theory represents a flawed guide for navigating trademark law's impending collision with neuroscience, what should take its place? This is a difficult question, with no agreed upon answer.²²² Trademark law is about regulating advertising. As the legal scholar Arthur Leff wrote forty years ago: "There is no 'whole story' that can be told about anything, especially anything as socially, economically, literarily, anthropologically, philosophically, legally, historically, and politically complex as advertising."²²³ Taking Leff's comment to heart, my aim here is not to produce a new unified theory of trademark law to supplant the search costs model. Instead, my goal is a more modest one of suggesting a supplemental principle—reinforcing

218. Tushnet, *supra* note 23, at 530.

219. *Id.* at 528 ("The dilution studies find some statistically significant differences in reactions between groups exposed and unexposed to dilutive ads, but statistical significance does not mean that practical effects are substantial.").

220. See Laura R. Bradford, *Emotion, Dilution, and the Trademark Consumer*, 23 BERKELEY TECH. L.J. 1227, 1234 (2008) (maintaining that dilution doctrine is justified, to a point, because "[t]hose who use famous marks in ways inconsistent from the owner risk making the marks more costly to evaluate").

221. See *supra* sources cited note 68 (noting ability of neural imaging to discern short-lived emotional states).

222. A few scholars have tried to replace the search costs theory with something else. See Chad J. Doellinger, *A New Theory of Trademarks*, 111 PENN ST. L. REV. 823, 824 (2007) (proposing a theory of trademarks grounded in "a normative code of proper business conduct"); McKenna, *supra* note 203, at 72, 122 (calling for a retooling of trademark law to focus on consumer autonomy and deception); Jeremy N. Sheff, *Marks, Morals, and Markets*, 65 STAN. L. REV. 761, 763 (2013) (promulgating a Kantian "contractualist" model to replace the search costs model).

223. ARTHUR LEFF, *SWINDLING AND SELLING* 148 (1976).

trademark law's traditional role of interrogating and encouraging cognitive, not emotional, reasoning—to aid courts wrestling with how to apply new evidence and understandings of human behavior to trademark doctrine.

1. Two Systems of Consumer Reasoning

Sometimes consumers think long and hard about a purchasing decision; sometimes they operate instinctually. Psychologists posit dual reasoning models, the most famous and influential of which comes from Nobel prize-winning psychologist Daniel Kahneman. According to Kahneman, there are two systems of thought that can be at play when making a decision.²²⁴ One is an automatic, intuitive, largely unconscious process that Kahneman labels “System 1” reasoning.²²⁵ The other is a conscious, deliberate, rational weighing of costs and benefits he designates “System 2” reasoning.²²⁶

One might describe System 1 as the emotional side of consumer choice and System 2 as the deliberative side.²²⁷ System 1's instinctual decision making can be extremely useful. We do not have the cognitive resources to engage in a lengthy, rational internal dialogue about every choice we make. Imagine using the laborious System 2 model for every buying decision, no matter how small or routine. But the automaticity of System 1 can also translate into exploitable flaws and biases that advertisers can use to place consumers at a disadvantage.²²⁸

Trademark law has traditionally focused its attention on System 2 reasoning even if it has not called it by that name. The

224. DANIEL KAHNEMAN, THINKING, FAST AND SLOW 13 (2011).

225. *Id.*

226. *Id.*

227. Jonathan St. B.T. Evans, *Dual-Processing Accounts of Reasoning, Judgment, and Social Cognition*, 59 ANN. REV. PSYCHOL. 255, 256–58 (2008) (“[I]t is clear that emotional processing would be placed in the System 1 rather than System 2 list. Emotion is explicitly linked to the first system in some dual-process accounts, implied by the neurological regions identified in others, and specifically attributed to automatic processes in some recent accounts of social cognition.” (internal citations omitted)); Dan M. Kahan, *Two Conceptions of Emotion in Risk Regulation*, 156 U. PA. L. REV. 741, 747–48 (2008) (discussing the relationship between System 1 reasoning, emotion, and the displacement of reflective thinking); Plassmann et al., *supra* note 9, at 428–29 (describing System 1 as “an emotional system” and System 2 as “a rational system”).

228. Shmuel L. Becher & Yuval Feldman, *Manipulating, Fast and Slow: The Law of Non-Verbal Market Manipulations*, 38 CARDOZO L. REV. 459, 470–71 (2016); Jon D. Hanson & Douglas A. Kysar, *Taking Behaviorialism Seriously: The Problem of Market Manipulation*, 74 N.Y.U. L. REV. 630, 743 (1999).

law of trademarks polices the informational signals that consumers rely on to determine the source of products and services offered for sale.²²⁹ When reliable, these signals help consumers make cognitive decisions about the source of goods.²³⁰ Source indicators can be used to bring up memories of past experiences with the manufacturer and item at issue.²³¹ They can also be used to find product reviews, whether from informal sources or institutions that test products. A trademark that serves as a source indicator can be used to access information released by government agencies (e.g., a product recall) or by competitors. All this information can be employed by the consumer to weigh the pros and cons of purchase.

Courts emphasize the dispassionate, rational side of decision making in trademark decisions.²³² This focus tends to train judicial attention on information used for rational choices rather than emotional instinct. Courts explain that “rational confusion” is the only kind of confusion that should be countenanced by trademark law.²³³ For example, the reason a judge gave for deeming a defendant’s use of the Wal-Mart name and “smiley face” marks non-infringing was that the defendant combined use of these trademarks with “unflattering words, images and portions of words that no rational consumer would expect Wal-Mart to associate with its own marks.”²³⁴

This is not to say, of course, that there is not an emotional component to branding. As neuroscience has made clear, there is a lot more conveyed by the COKE trademark than the product’s origin from the Atlanta, Georgia-based soft-drink company.

229. See, e.g., *Scandia Down Corp. v. Euroquilt, Inc.*, 772 F.2d 1423, 1429 (7th Cir. 1985) (“Trademarks help consumers to select goods. By identifying the source of the goods, they convey valuable information to consumers at lower costs. Easily identified trademarks reduce the costs consumers incur in searching for what they desire, and the lower the costs of search the more competitive the market.”).

230. McGeeveran & McKenna, *supra* note 204, at 272–73.

231. See Bradford, *supra* note 220, at 1245–46 (describing the interaction between trademarks and consumer memories of brands).

232. See Deven R. Desai, *Bounded by Brands: An Information Network Approach to Trademarks*, 47 U.C. DAVIS L. REV. 821, 823–24 (2014) (maintaining that the most popular approach to analyzing consumer behavior for trademark law assumes that “consumers are rational gatherers and processors of information as they make purchases”).

233. *Pernod Ricard USA, LLC v. Bacardi U.S.A., Inc.*, 653 F.3d 241, 252 n.12 (3d Cir. 2011) (“[A] consumer survey should not be necessary or dispositive when it is plain from an advertisement that rational confusion is not possible.”).

234. *Smith v. Wal-Mart Stores, Inc.*, 537 F. Supp. 2d 1302, 1336 (N.D. Ga. 2008).

Advertisers spend most of their efforts trying to impregnate trademark words and symbols with emotional meaning, not simply providing consumers with factual inputs for System 2 reasoning.²³⁵

Sometimes courts deciding trademark cases acknowledge advertising's emotional components. The U.S. Supreme Court described the "creation of a market through an established symbol" as a "psychological current engendered by the various advertising devices which give a trade-mark its potency."²³⁶ On rare occasions, judges see a threat, citing perceived attempts to play on consumers' System 1-type reasoning as justification for narrowing trademark law's scope. In the early twentieth century, some judges and legal scholars attempted to divide brand loyalty into a rational type that warranted legal protection and an irrational one that did not. In their view, brand loyalty maintained through factors unrelated to product quality, "such as unreflective habit," jeopardized rational consumer choice and, by extension, marketplace efficiency.²³⁷ In 1968, the Ninth Circuit Court of Appeals objected to using trademark law to protect a brand's emotional hold on consumers: "The primary value of the modern trademark lies in the 'conditioned reflex developed in the buyer' . . . [t]o the extent that advertising of this type succeeds . . . economically irrational elements are introduced into consumer choices; and the trademark owner is insulated from the normal pressures of price and quality competition."²³⁸ Years later, the same court explained that the federal trademark statute, the Lanham Act, was meant to be read narrowly to only protect against "fraud and consumer confusion."²³⁹ It declined to find infringement in the case at hand, explaining that "[t]o read the Act more broadly invites anticompetitive and irrational market behavior."²⁴⁰

235. See Becher & Feldman, *supra* note 228, at 476–81. This is especially true when one thinks of all the attention marketers give to color choice and other visual cues, selections that contain little valuable information for System 2 decision making. *Id.*

236. *Mishawaka Rubber & Woolen Mfg. Co. v. S.S. Kresge Co.*, 316 U.S. 203, 208 (1942); see also *Hat Corp. of Am. v. D.L. Davis Corp.*, 4 F. Supp. 613, 623 (D. Conn. 1933) (noting the "delicate factors" like "stress of voice, emphasis, and arrangement of type" calibrated by advertisers for maximum emotional impact).

237. Robert G. Bone, *Hunting Goodwill: A History of the Concept of Goodwill in Trademark Law*, 86 B.U. L. REV. 547, 590 (2006).

238. *Smith v. Chanel, Inc.*, 402 F.2d 562, 567 (9th Cir. 1968).

239. *Prudential Ins. Co. of Am. v. Gibraltar Fin. Corp. of Cal.*, 694 F.2d 1150, 1153 (9th Cir. 1982).

240. *Id.*

Generally speaking, however, trademark law has eschewed explicit consideration of the emotional impact of particular advertising strategies.²⁴¹ The likelihood of confusion factors employ various inputs—like mark similarity and relatedness of the plaintiff’s and defendant’s product areas—to assess a consumer’s rational perception of the source of the defendant’s product.²⁴² To the extent these factors could also be used to assess more emotional aspects of consumer decision making, the courts have declined the invitation. For example, of all the likelihood of confusion factors, purchaser sophistication seems most suited to diagnosing when System 1 reasoning about commercial stimuli might be at play. The sophistication factor invites judicial assessments of a trademark’s and shopping milieu’s power to override deliberative faculties.²⁴³ Nevertheless, a comprehensive study revealed that a large percentage of infringement cases failed to address the factor at all.²⁴⁴ Instead, there is a general judicial reluctance to designate any kind of relevant consumer group as particularly sophisticated, i.e., less susceptible to advertisers’ emotional arts.²⁴⁵

Trademark law’s historical reluctance to interrogate the System 1 thought processes of consumers may stem from prudential concerns. System 2 influences are easier to detect than influences on System 1 thinking since the latter act largely below the surface of conscious awareness. For example, the difficulty of demonstrating an “association” between the plaintiff’s and defendant’s marks necessary to make a case for dilution has limited the availability of that cause of action. Proof of this kind of spontaneous, unthinking mental process in consumers’ heads

241. See Irina D. Manta, *Branded*, 69 SMU L. REV. 713, 734–35 (2016) (criticizing the law’s failure to reflect the emotional components of successful branding).

242. See *supra* note 41 and accompanying text (describing the likelihood of confusion factors).

243. See, e.g., *Lever Bros. Co. v. Am. Bakeries Co.*, 693 F.2d 251, 259 (2d Cir. 1982) (positing, under the purchaser sophistication factor, that “the bustling, self-service atmosphere of a typical supermarket makes careful examination of products unlikely”).

244. Beebe, *Empirical Study*, *supra* note 134, at 1642.

245. See, e.g., *Incredible Techs., Inc. v. Virtual Techs., Inc.*, 400 F.3d 1007, 1016 (7th Cir. 2005) (declining to recognize lower level of purchaser sophistication for the slightly intoxicated bar patrons that typically play the defendant’s video games). Judges tempted to put much weight on the purchaser sophistication factor have been openly chastised. See, e.g., *E. & J. Gallo Winery v. Consorzio Del Gallo Nero*, 782 F. Supp. 457, 465 (N.D. Cal. 1991).

has been hard to come by.²⁴⁶ By contrast, survey evidence of confusion seems to focus on System 2 cognition, assessing whether consumers deliberating over an advertising stimulus will mistake it for the plaintiff's trademark.²⁴⁷ As challenging as it is to get an accurate read of elements of conscious consumer perception (like the perceived similarity between two marks), evidence of unconscious consumer responses to trademarks has been even harder to obtain. As a result, trademark law's efforts to channel consumer perception have historically focused on cognitive rather than emotional decision making.

Emotion is beginning to play a larger role in trademark law, however. As described below, relatively recent changes to the law make consumers' emotional responses to advertising a focal point when assessing liability. These changes offer opportunity for consumer neuroscientists promising more information on consumers' emotional responses to advertising stimuli. Researchers studying consumer emotion claim to be able to avoid the problem of suggestive survey questions by simply "reading out" the brand personality traits that "exist in the mind of the consumer a priori."²⁴⁸ These readings of brand personality, or what I have described as neuromarks, promise measurement of consumers' emotional understanding and engagement with brands. If you believe the neuroscientists, the evidentiary barriers that caused courts to avoid consideration of shoppers' System 1 reasoning in the past will soon be overcome.

2. Moving Towards Emotion

More recent initiatives in trademark law are geared to assessing and regulating the emotional System 1 decisions made by consumers. Unlike an action for trademark infringement, an action for trademark dilution does not require proof that consumers will mistake the defendant's mark for the plaintiff's, making an incorrect assumption as they rationally evaluate whether or not to buy the defendant's product. Instead, dilution law stops unauthorized uses of famous trademarks that somehow dim the signaling power of the famous trademark on a non-cognitive, subconscious, emotional level.²⁴⁹ A successful dilution

246. See *supra* notes 177–80 and accompanying text.

247. See Bradford, *supra* note 220, at 1274 n.230.

248. Chen et al., *supra* note 18, at 455.

249. Katya Assaf, *Brand Fetishism*, 43 CONN. L. REV. 83, 129–30 (2010); Gideon Parchomovsky & Alex Stein, *Intellectual Property Defenses*, 113 COLUM. L. REV. 1483, 1508 (2013).

by tarnishment claim rests on the notion that consumers irrationally lower their estimation of the plaintiff's famous trademark when they see the defendant use that mark in a different, non-confusing context.²⁵⁰ An instinctual downgrading of the Rolls-Royce automotive brand after seeing another actor use that brand in a non-confusing but sexualized context is System 1 reasoning, not System 2 deliberation.²⁵¹ Until the arrival of the dilution cause of action, courts rarely countenanced this kind of emotional reasoning on the part of consumers.

Courts have also recognized a doctrine of "post-sale" confusion that occurs not at the moment of purchase, but when onlookers see a purchaser brandishing a trademarked item and wrongly associate the item with the plaintiff's mark.²⁵² At first glance, the theory behind post-sale confusion might seem to concern itself only with consumers' System 2 deliberations. One justification for policing post-sale confusion is to protect downstream purchasers making their own decisions about products. The initial purchasers of a counterfeit Rolex watch may know exactly what they are getting given the low cost and circumstances of the watch's purchase. But onlookers seeing the counterfeit may not. They may wrongly attribute any defects in product quality to the actual trademark owner instead of the counterfeiter. Under this rationale, the doctrine of post-sale confusion helps prevent misleading information from polluting the rational decision making of potential future purchasers.

Yet the evidence of such misleading information influencing downstream purchasing decisions is often quite thin. The narrative of the confused onlooker is plausible, but it may be just as likely that onlookers recognize the counterfeit good for what it is and experience no confusion as to source. If a frugal friend suddenly starts sporting a Rolex watch, we will likely doubt its provenance.

Perhaps recognizing this evidentiary deficit, courts often articulate an alternative justification for post-sale confusion that

250. See, e.g., McKenna, *supra* note 203, at 106.

251. In *Rolls-Royce*, the court based its decision that a rapper's stage name tarnished the luxury car brand, in part, on the rapper's use of song titles like "Hoe in You" and an advertisement featuring "a scantily-clad woman." *Rolls-Royce Motor Cars Ltd. v. Davis*, No. 15-0417 (KM), 2016 WL 3913640, at *8 (D.N.J. Mar. 11, 2016).

252. E.g., *Payless Shoesource, Inc. v. Reebok Int'l, Ltd.*, 998 F.2d 985, 989 (Fed. Cir. 1993). For an exhaustive analysis and critique of the post-sale confusion doctrine, see generally Jeremy N. Sheff, *Veblen Brands*, 96 MINN. L. REV. 769 (2012).

has little to do with consumer confusion as to source at all. Instead, courts assert the doctrine's necessity as a means to regulate consumers' emotional attitudes towards a brand. According to some, the doctrine of post-sale confusion is really a pretext for a larger concern with preserving the ability of luxury goods to signal status.²⁵³ Judges openly reason that past purchasers of the trademark owners' branded goods will suffer if they witness others displaying the same mark on unauthorized products.²⁵⁴

For example, in one case involving the sale of kit cars that resembled Ferraris, the court observed:

If the country is populated with hundreds, if not thousands, of replicas of rare, distinct, and unique vintage cars, obviously they are no longer distinct, and they are no longer unique. Even if a person seeing one of these replicas driving down the road is not confused, Ferrari's exclusive association with this design has been diluted and eroded.²⁵⁵

Note that this description of post-sale confusion really describes a harm to the emotional power of the Ferrari brand built up through advertising. The Ferrari name signals status and prestige, but these emotional valences come under threat when Ferrari luxury suddenly seems accessible to a larger swath of the population. Actual Ferrari cars mechanically perform just as well as they ever did, but consumers' emotional response to the Ferrari brand changes if it no longer indicates exclusivity. Under this rationale, courts recognize post-sale confusion to preserve the emotional snob appeal of the mark, not to prevent buyers from making rational decisions under false pretenses.²⁵⁶ Like di-

253. Mark P. McKenna, *Probabilistic Knowledge of Third-Party Trademark Infringement*, 2011 STAN. TECH. L. REV. 10, 12 (2011); Sheff, *supra* note 252, at 790–94.

254. See, e.g., *Gen. Motors Corp. v. Keystone Auto. Indus., Inc.*, 453 F.3d 351, 358 (6th Cir. 2006); *Acad. of Motion Picture Arts & Scis. v. Creative House Promotions, Inc.*, 944 F.2d 1446, 1457 (9th Cir. 1991); see also Katya Assaf, *Buying Goods and Doing Good: Trademarks and Social Competition*, 67 ALA. L. REV. 979, 1005–06 (2016) (“Another oft-mentioned justification for the post-sale confusion doctrine points out that the value of the original trademark, which derives in part from its scarcity, is likely to be diminished by widespread counterfeits.”).

255. *Ferrari S.p.A. Esercizio Fabbriche Automobili e Corse v. McBurnie*, 11 U.S.P.Q. 2d 1843, 1848 (S.D. Cal. 1989).

256. See, e.g., *Hermes Int'l v. Lederer de Paris Fifth Ave., Inc.*, 219 F.3d 104, 108 (2d Cir. 2000) (discussing differences between point-of-sale confusion and post-sale confusion). This is not to say that a concern with maintaining one's status through the conspicuous display of certain material goods is completely irrational. But such a concern is more likely to be fueled by emotional considerations when compared to other criteria for purchase like product performance

lution law, post-sale confusion is geared less to consumers' rational consideration of product information and more to protecting the investment made by famous brand holders in acquiring emotional mindshare.

The arrival of the neuromark may offer legally-cognizable evidence of how the buying public emotionally responds to different trademarks. A change in a trademark's neural signature after consumers are exposed to a flood of knock-off products might be offered to illustrate the harms of post-sale confusion. Tarnishment claims could be bolstered by showing how various indices in a mark's neural map (e.g., its reputation for ruggedness) decline once consumers have been exposed to the defendant's mark. Even though inquiries into System 1 reasoning have traditionally been disdained or avoided by trademark courts, this may change as such reasoning suddenly appears susceptible to measurement, not judicial guesswork. With neuromarks, the practical barriers that once restrained courts from exploring the emotional aspects of consumer decision making may no longer seem to be an issue.

3. Privileging Deliberation Over Emotion

A move to legally recognize consumers' emotional reactions towards brands is not necessarily in consumers' best interests. Recognizing evidence of emotional value in a trademark is likely to privilege that value.²⁵⁷ This Article maintains that, in determining how neuroscientific insights should be incorporated into trademark law, courts should try to limit themselves to consideration of consumers' cognitive, deliberative judgments, not their emotional, instinctual ones. At the very least, courts should exercise an abundance of caution as businesses clamor to introduce neural information of consumer emotional state.

It would be fair to ask why trademark law should limit itself to only one side of consumers' dual reasoning system, particularly when laboratory discoveries are shedding new light on the role of emotions in human decision making. More accurate understanding of consumer perception represents a longstanding

and reliability. Moreover, consumption based on the desire for status is correlated with lower life satisfaction, perhaps testifying to the irrational nature of some status-related consumer decision making. See TIM KASSER, *THE HIGH PRICE OF MATERIALISM* 5–22 (2002).

257. See Rochelle Cooper Dreyfuss, *Expressive Genericity: Trademarks as Language in the Pepsi Generation*, 65 NOTRE DAME L. REV. 397, 405 (1990) (describing emergence of the "if value, then right" rationale in trademark law).

goal for judges deciding trademark cases. Discounting neural evidence of automatic, emotional reasoning would seem to ignore that goal just as it begins to come within reach.²⁵⁸ Nevertheless, there are at least three good reasons for limiting trademark law's ambit to the cognitive side of consumer decision making.

First, even as neuroscience offers evidence of emotional response, it should be kept in mind that emotions represent complex mental processes that are not yet fully understood by researchers. Neuroscientists are on safer ground when they map the neural indices of familiarity with a brand, evidence directly relevant to trademark law's acquired distinctiveness analysis. Trying to pinpoint the emotional response necessary to prove harm to a trademark's reputation requires consideration of many more variables. Given this complexity, allowing neuroscientific evidence of consumer emotion to decide trademark dilution cases could lead to anti-competitive outcomes.

For example, I may be familiar with the BEN & JERRY'S mark for ice cream and this familiarity may even be revealed through fMRI readings thereby supplying evidence correlated with acquired distinctiveness. But arguing that I have a particular positive emotional reaction to the Ben & Jerry's trademark that will be eroded by a non-confusing use of "Ben & Jerry's" on another product requires disentangling my general love of ice cream with my specific feelings towards the Ben & Jerry's brand. The concern is treating neural evidence of an emotional reaction

258. In addition, scientists are still probing the truth of the split between emotional and cognitive thinking. Some psychological studies challenge the dual processing model favored by Kahneman and others, and even Kahneman admits to some overlap between System 1 and System 2. KAHNEMAN, *supra* note 224, at 86 ("System 1 is expected to influence even the more careful decisions. Its input never ceases."). Yet some neuroscientists point to imaging results that they say affirm the presence of two different systems of consumer decision-making—one evaluative and goal-directed, the other automatic and habit-based. See George I. Christopoulos et al., *Toward an Understanding of Dynamic Moral Decision Making: Model-Free and Model-Based Learning*, 144 J. BUS. ETHICS 699, 703 (2017) (discussing habitual and goal-directed learning strategies); John P. O'Doherty et al., *Learning, Reward, and Decision Making*, 68 ANN. REV. PSYCHOL. 73 (2017) (same); Antonio Rangel et al., *A Framework for Studying the Neurobiology of Value-Based Decision Making*, 9 NATURE REVIEWS NEUROSCIENCE 545, 547–48 (2008) (same). My suggestion that trademark courts limit themselves to investigating System 2 reasoning does not depend on the empirical truth of the dual processing model, however, or the complete separation of one processing track from another. Even if these decision-making processes are not neurally discrete and consumers employ both System 1 and System 2 reasoning when making most or even all purchasing decisions, there are normative reasons for courts to be more receptive to evidence of System 2 reasoning in the trademark law context.

to a product as proof of an emotional attachment to a single trademark. More broadly, there is a danger in being overly persuaded by fMRI images that supposedly reveal the neural architecture of a complex, ill-defined emotional state like tarnishment. As a prominent critic of brain imaging research notes, neuroscientific examinations of concepts (whether psychological or legal) that are vague and unspecified naturally produce unreliable results.²⁵⁹

In concept, the neuromark suggests a future where a brand's emotional signature can be teased apart from the product it is attached to. But it may take a long time for neuroscience to get there, if ever. Courts should be reluctant to recognize neuroscientific evidence of the psychological pull of a brand on the public that overlaps to any degree with the emotional hold of the product being sold under that brand. Because dilution law does not require that speech be misleading, it endangers a whole range of valuable expression in a way that infringement law does not.²⁶⁰ The danger of stifling this expression looms even larger if courts entertain neuroscientific evidence of trademark dilution that really reflects harm to entire product categories instead of particular trademarks.

Second, there are benefits to defining trademark law so as to prompt consumers to use their deliberative faculties instead of their automatic, instinctual ones. As Fred Yen has posited, trademark doctrines that allow some amount of confusion to exist actually benefit consumers by encouraging them to develop greater brand literacy and awareness.²⁶¹ Consumers that experience confusion become better at distinguishing between trademarks; those lacking this experience fail to recognize important distinctions.²⁶² According to Yen, although many of our shopping decisions rely on the automaticity of System 1, we need moments of confusion to slow the process down and engage System 2 to

259. UTTAL, *supra* note 161, at 21–22.

260. Pratheepan Gulasekaram, *Policing the Border Between Trademarks and Free Speech: Protecting Unauthorized Trademark Use in Expressive Works*, 80 WASH. L. REV. 887, 926–27 (2005).

261. Alfred C. Yen, *The Constructive Role of Confusion in Trademark*, 93 N.C. L. REV. 77, 125 (2014).

262. *Id.*; see also Barton Beebe & C. Scott Hemphill, *The Scope of Strong Marks: Should Trademark Law Protect the Strong More Than the Weak?*, 92 N.Y.U. L. REV. 1339, 1395 (2017) (positing that if competitors are allowed to “snuggle” near very strong marks, consumers may suffer some initial confusion but will quickly learn to adapt and no longer be confused).

create new strategies for decoding advertising stimuli.²⁶³ Eventually, these new strategies may become so routine as to be automated and used by System 1 but we need System 2 reasoning to create them in the first place.²⁶⁴ “At the very least,” Yen says, “modest confusion concerning trademarks actually helps consumers avoid confusion by helping them develop valuable cognitive skills that make distinguishing and understanding trademarks possible.”²⁶⁵

Just as an overly broad view of consumer confusion threatens the development of these cognitive skills, an embrace of neuroscientific evidence of emotional response to trademarks could jeopardize consumers’ ability to learn from and avoid advertising’s emotional traps. Businesses spend an enormous amount of resources trying to convince us of a trademark’s particular emotional meaning. Some attack this entire process as economically wasteful, with the money spent on persuasive (as opposed to informational) advertising better spent on the research needed to make functionally better products.²⁶⁶ But one doesn’t have to be such an advertising skeptic to recognize that consumers need to develop the ability to comprehend and resist some of the emotional appeals engineered by advertisers. Just taking Apple’s word for it that it “thinks differently” than other technology companies or uncritically accepting Ford’s suggestion that its trucks are “Built Ford Tough” would lead to suboptimal choices in the marketplace. Laws like dilution that limit challenges to these emotional messages give consumers less practice in deciphering and resisting advertising’s System 1 appeals. The consumer’s affective response to the ROLLS ROYCE mark becomes less discerning if she never had the opportunity to be exposed to Rolls Royce Rizzy’s slightly alternative take. Using neuroscientific evidence of changes to a mark’s emotional meaning to prohibit alternative brand messages would hamper consumers’ ability to develop greater literacy with the emotional language of modern advertising.

Finally, although my focus here has been on courts’ use of neuroscientific evidence and not advertisers’ applied use of neuroscientific insights, the two are related. Trademark law rewards some advertising strategies while penalizing others. Even

263. Yen, *supra* note 261, at 125.

264. *Id.*

265. *Id.* at 125–26.

266. See, e.g., Ralph S. Brown, Jr., *Advertising and the Public Interest: Legal Protection of Trade Symbols*, 57 YALE L.J. 1165, 1169 (1948).

if neural imaging promises a way to more accurately predict consumer perception, and thereby makes it easier to detect consumer confusion and mark dilution, judges should address the difficult underlying question of which advertising strategies trademark law should be in the business of promoting and which ones it should undermine, or at least not reinforce, in furtherance of consumer welfare.²⁶⁷ Decisions about the admissibility and effect of consumer neuroscience evidence require courts to decide whether they should passively ratify advertising strategies that leverage the automatic, emotional side of human reasoning or more actively question the net social benefit of legal protection for such strategies.

For most of its history, trademark law has reacted passively to changing marketing methods instead of proactively shaping the ways in which consumers shop and producers sell. For example, the likelihood of confusion analysis adjusted to new forms of brand merchandizing (think John Deere key chains and t-shirts) by simply enlarging the sphere of potential confusion without really interrogating whether such merchandizing should be part of trademark law's remit. It is by no means clear that trademark holders should have exclusive rights over the sale of products that use marks primarily for their ornamental value, rather than as indicators of source. Nevertheless, a series of trademark infringement decisions quickly ratified the right to use trademarks to merchandize.²⁶⁸

A historical counterexample offers a useful reference point for courts evaluating the proper role of consumer neuroscience evidence for trademark law. According to its originator, dilution law was designed to safeguard the "psychological hold" that successful advertising had on the public.²⁶⁹ Courts were hesitant to enforce laws that provided businesses this power, which they considered a radical expansion.²⁷⁰ Even though the whole point of these new causes of action was to arm mark holders with a

267. See GRAEME B. DINWOODIE & MARK D. JANIS, *TRADEMARKS AND UNFAIR COMPETITION: LAW AND POLICY* 24 (4th ed. 2014) (discussing the debate over whether trademark law should be reactive or proactive towards new advertising techniques).

268. See Stacey L. Dogan & Mark A. Lemley, *The Merchandising Right: Fragile Theory or Fait Accompli?*, 54 *EMORY L.J.* 461, 463 (2005) (summarizing the history of merchandizing trademarks).

269. Frank I. Schechter, *The Rational Basis of Trademark Protection*, 40 *HARV. L. REV.* 813, 831 (1927).

270. Sara Stadler Nelson, *The Wages of Ubiquity in Trademark Law*, 88 *IOWA L. REV.* 731, 763 (2003).

way to stop non-confusing unauthorized uses of their marks, judges decided to require confusion for a successful dilution action. Other courts required proof of actual dilution, evidence that was extremely hard to come by and not required by the statutory language. Part of this judicial resistance stemmed from a belief that dilution threatened a sort of mind control, with the law preventing consumers from shaking their initial impression of a famous mark.²⁷¹ Out of antipathy to the very conception of dilution, courts made dilution impossible to prove.

The initial period of judicial intransigence to dilution law is instructive.²⁷² Resistance to dilution law came in the context of a larger social and legal backlash against advertising techniques that relied on subliminal messaging and psychoanalysis to influence consumers. Federal officials and agencies and quasi-public regulators all reacted to put limits on some of these techniques because they appeared to violate an accepted vision of human autonomy.²⁷³ Somewhat similarly, judges saw a stark difference between the traditional role of trademark law in regulating the deliberative, cognitive choices of consumers and its newer role in shaping their unconscious, emotional reasoning.²⁷⁴ This fault line will be relevant again as courts confront neuroscientific evidence of a mark's unique emotional signature in consumers' minds.²⁷⁵

271. BARTHOLOMEW, *supra* note 95, at 91–122.

272. Over time, trademark holders overcame the initial judicial resistance to dilution law. In 2003, the U.S. Supreme Court held that “actual dilution” needed to be proven for a successful dilution claim. *Moseley v. V Secret Catalogue, Inc.*, 537 U.S. 418, 432 (2003). Concerned that a requirement that plaintiffs prove actual dilution would effectively eviscerate the dilution cause of action, Congress quickly moved to pass a new law affirming that only a “likelihood of dilution” was required for a successful dilution claim, and courts had little choice but to acquiesce. Trademark Dilution Revision Act of 2006, Pub. L. No. 109–312, 120 Stat. 1730.

273. BARTHOLOMEW, *supra* note 95, at 112–16. It turns out that these marketing strategies were more hype than reality, but the more important lesson from this historical period was that lawmakers saw their role as setting limits on a new form of advertising. *Id.*

274. Some of the opposition to dilution law may have also come from related concerns over competition. Dilution law threatens to place other businesses at a disadvantage by restricting their ability to use certain terms, even when there is no risk of confusion. Beverly M. Pattishall, *The Case for Anti-Dilution Trade-Mark Statutes*, 43 TRADEMARK REP. 887, 888 (1953) (contending that courts avoided granting relief in early trademark dilution cases out of fear of encouraging monopolistic and anti-competitive behavior).

275. One might argue that if trademark law should not facilitate consumers' System 1 reasoning, then dilution law should be abandoned as a whole. At this point, however, dilution law does not seem to be going away. Any legal changes

CONCLUSION

Criminal law has received the lion's share of attention, but, in some ways, trademark law represents the legal arena most likely to respond to advances in brain science. Judicial guesses as to consumer perception determine the most important aspects of trademark law. If consumer neuroscience promises a better understanding of the consumer's brain, then that understanding would seem to improve the accuracy of judicial decision-making in this particular legal terrain. Already, courts routinely accept outside surveys of potential consumers to assess distinctiveness and likelihood of confusion. One does not have to be a science fiction fan to envision a future where neural imaging replaces judicial intuition in determining the outcomes of trademark disputes.

The history of law and psychology indicates, however, that calls for sudden changes in how trademark cases are decided will not be welcome. Instead, consumer neuroscience evidence will slowly work its way into specific pockets of trademark law, weakening some tests based on judicial intuition while gradually strengthening the claims of trademark holders. Some of these alterations will be beneficial. But others will simply result in more control by trademark holders with little thought to consumers' interests apart from shopping efficiency. Consumer neuroscientists contend that machines can measure the effects of advertising on our minds at an incredibly fine-grained level. Perhaps the reliability of these measurements has been overstated, particularly when it comes to decoding some of the complex mental processes at issue in trademark law. Even more importantly, by itself, measurement of consumer perception does not reveal how that measurement should be accounted for in the law. Ultimately, it is up to judges and lawmakers to decide if the psychological hold captivating trademarks have over us deserves legal protection. The answer will not come from records of blood flow and electrical activity in consumers' brains.

prompted by consumer neuroscience are unlikely to include the abandonment of an entire cause of action. *See supra* Part II.B.