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ANTIBODY PATENTS: USE OF THE WRITTEN DESCRIPTION AND ENABLEMENT REQUIREMENTS AT THE PATENT & TRADEMARK OFFICE

S. Sean Tu[†] *& Christopher M. Holman*[††]

ABSTRACT

Antibody patents form the basis of some of the most valuable biotechnology products on the market. In 2020 alone, sales of the top three drugs exceeded $49.5 billion dollars. Two of those three drugs are monoclonal antibodies (Humira and Keytruda). In the past, patent law offered broad protection for monoclonal antibodies. As time has progressed, however, courts have narrowed the scope of antibody patents. Yet, very little research has been done to see how patent examiners are applying the rules of patentability to these valuable antibody patents.

We examine approximately two decades worth of antibody patents to determine how the US Patent Office has dealt with them. Specifically, we examine a sample of every patent directed to an antibody composition of matter from 2001–present. We find that patent examiners have steadily increased the use of 35 U.S.C. § 112(a) enablement and written description rejections while slightly decreasing the use of anticipation and obviousness rejections. These data suggest that § 112(a) plays a greater role in policing claim scope than prior art rejections, which is the most frequently used rejection type for every other technology center. Correspondingly, patent applicants have also adjusted their claim drafting, moving from broad claims based only on function to narrow claims based on antibody structure.

We also find that the number of antibody composition patents has dramatically increased, while the number of claims per patent has decreased. Additionally, the number of words in each independent claim has increased threefold. These data present an interesting evolution for antibody patents that mirrors the changing nature of antibody technology and offers some insights for improving antibody patent prosecution.

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I. INTRODUCTION

Antibody patents are associated with some of the most valuable drugs in the world. In 2021, two of the top three highest-selling drugs were monoclonal antibodies (Humira and Keytruda), bringing in billions of dollars in sales. During the same year, four of the top six drugs were monoclonal antibodies, taking home a staggering $54.4 billion.[1] As biologics overtake small molecules[2] as the world's most valuable drugs, antibody patents play an increasingly important role for drug companies, health insurance companies, and consumers.

The evolution of antibody patents has dramatically shifted from the early 2000s to present. Previously, antibody patents were granted broad genus-type protection. Currently, however, antibody patents usually cover narrow specific antibodies that have well defined structures, especially when it comes to the structural elements that define the specific binding regions of the antibody.

This shift in scope has been shown by courts recently invalidating claims with broad scope. For example, the Federal Circuit recently overturned a $1.2 billion jury verdict on a biotechnology patent based on antibody type technology, finding the asserted claims too broad and thus invalid under the written description requirement.[3] This narrowing of antibody claims is likely not due to obviousness or anticipation rejections because courts and the United States Patent and Trademark Office (USPTO) do not use 35 U.S.C.

1. Lisa Urquhart, *Top Product Forecasts for 2021*, 20 NATURE REV. DRUG DISCOVERY 10, 10 (2021).

2. Small molecules are chemical compounds that have low molecular weights. Small molecules typically contain only 20–100 atoms. Examples of small molecules include aspirin, penicillin, or esomeprazole. In contrast biological drugs are large, complex drug molecules that are manufactured from living organisms. Biologics are typically larger in size with a single molecule consisting of 200–50,000 atoms. Examples of biologics include insulin, vaccines, and monoclonal antibodies.

3. Juno Therapeutics, Inc. v. Kite Pharma, Inc., 10 F.4th 1330 (Fed. Cir. 2021).

§ 102 or § 103 rejections[4] to invalidate or prevent antibody patents from issuing.[5] This is interesting because for all other technology centers, we see that § 102 and § 103 are the primary mechanisms that examiners use to reject subject-matter eligible patents[6] and also the primary mechanism that courts use to invalidate patents.[7]

Changes in technology always move faster than changes to the law. Courts are constantly playing a game of catch up to new technological developments. In the patent realm there is an added layer of review by the USPTO. Changes to USPTO policy occur even slower than courts because the USPTO must respond to court decisions, usually in the form of guidance documents and/or examiner training materials. Accordingly, changes to patent policy at the prosecution level should, in theory, lag behind changes in the law.

Surprisingly, our data show that patent examiners at the USPTO have been independently applying a higher standard of review for antibody patents even before the USPTO put out specific guidance and far before current Federal Circuit caselaw. Specifically, patent examiners were increasingly using the enablement and written description requirements for biotechnology patents long before courts began applying an enhanced 35 U.S.C. § 112(a) requirement.

For most areas of technology, prior art rejections are the most difficult hurdles that applicants must overcome to obtain a patent. However, antibody patents face a very different challenge. Specifically, lack of enablement and not meeting the written description requirement seem to be the most difficult hurdles to overcome for antibody composition of matter claims.[8] These types

4. 35 U.S.C. § 102 is the novelty requirement and is based on the idea that a patent applicant cannot receive a patent to an invention that has already been disclosed in the prior art. 35 U.S.C. § 102 requires that each and every element of the claim be disclosed in only one prior art reference. In contrast, 35 U.S.C. § 103 is based on the idea that obvious variations to an invention should also not be patentable. 35 U.S.C. § 103 allows multiple references to be combined to disclose each and every element of the patented invention. *See* S. Sean Tu, *Patenting Fast and Slow: Examiner and Applicant Use of Prior Art*, 38 CARDOZO ARTS & ENT. L.J. 391 (2020).

5. *See infra* Figure 4.

6. *See infra* Figure 4.

7. *See generally* S. Sean Tu, *Patent Examiners and Litigation Outcomes*, 17 STAN. TECH. L. REV. 507 (2014); *see also* S. Sean Tu, *Invalidated Patents and Associated Patent Examiners*, 18 VAND. J. ENT. & TECH. 135, 159 (2015).

8. 35 U.S.C. § 112(a) encompasses both the "written description" and enablement requirements. Before the America Invents Act, § 112(a) was referred to as "§ 112 first paragraph." 35 U.S.C. § 112(a) requires that an inventor's disclosure in the specification of the application must be sufficiently complete to enable a "person having ordinary skill in the art" to make and use the invention without having to engage in an undue amount of experimentation. These two standards are distinct, but closely related. *See* Ariad Pharms., Inc.

of challenges that are rare in most other technology areas are common for antibody technologies.

We argue that the enhanced § 112(a) standard applied by examiners is keyed more towards changes in antibody technology and less towards changes in the law. As antibody technology changed from being primarily used as a diagnostic tool to a therapeutic drug, patent examiners quickly adjusted to the technology by rejecting those broad antibody claims for lack of enablement and/or the necessary written description requirements.

Most USPTO examiners do not have a legal background, but all examiners are required to have a technical background. These data support the idea that patent examiners were able to respond to changes in technology well ahead of any formal guidance from the USPTO and the courts. In fact, for a long period of time, examiners seem to have been applying a stricter standard than that set forth in Federal Circuit precedent. By applying this stricter standard for written description and enablement *in response to changes in the technology*, patent examiners narrowed antibody claims to give exclusive rights to only those narrow claims that are supported by the disclosure of the specification. In this way, although the claims are narrower, they avoid invalidation via anticipation and obviousness arguments.

II. ANTIBODY TECHNOLOGY

Antibodies, or immunoglobulins ("Ig"), are a part of the immune system that can identify and neutralize foreign objects, such as pathogens and toxins. Antibodies are Y-shaped, and the tips of each of the Y structure contain six Complementarity Determining Regions (CDRs) that gives each individual antibody its remarkable specificity (each antibody specifically recognizes and binds a single epitope on an antigen).

Antibodies serve to identify foreign particles, broadly referred to as antigens, for destruction by other components of the immune system. Antigens can be broadly defined as any substance that can cause an immune system to produce antibodies against it. Antigens can include substances from the environment like chemicals, bacteria, viruses, or pollen, and in some cases, antigens can even form inside the body.

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v. Eli Lilly & Co., 598 F.3d 1336 (Fed. Cir. 2010) (en banc). The quid pro quo behind patent law requires that the inventor notify the public of the metes and bounds of the property interest by writing "claims" that notify the public of the exact contours of the property interest covered by the patent. *See* John R. Allison & Lisa Larrimore Ouellette, *How Courts Adjudicate Patent Definiteness and Disclosure,* 65 DUKE L.J. 609, 617 (2016).

A more in-depth description of antibody technology can be found in Appendix 1.

In Part III, we discuss the databases that were created for this study. In Part IV we present our results. In Part V we present how these results fit within § 112(a) jurisprudence. Finally, in Part VI, Professor Tu offers policy recommendations and critiques the current state of antibody patents based on our findings.[9]

III. THE DATASETS

We created three unique datasets for this study.[10] The goal of this study was to determine whether antibody claims experience a different prosecution history compared to other biotechnology patents.

A. THE ANTIBODY DATASET

The first dataset comprises of over 6,000 patents containing antibody composition of matter patents (hereinafter *antibody dataset*). These patents had filing dates ranging from November 29, 2000 to June 1, 2021 and issue dates from June 18, 2002 to August 3, 2021.[11] These data were obtained from the USPTO's Public Web-based Examiner's Search Tool (PubWEST) through the Patent and Trademark Resource Center (PTRC).

Our initial search included every patent with the term "antibody" within the claim (over 46,000 patents). However, after reviewing the claims of numerous patents, we determined that the dataset was too broad for our purposes and included many patents that were only tangentially related to antibodies. Accordingly, we used a title search using the term "antibod$" which resulted in 15,285 patents. We then reviewed the titles of these patents to determine if the patents truly represented antibody composition of matter

9. S. Sean Tu is the sole author of Part VI and all opinions in Part VI should be solely attributed to him.

10. S. Sean Tu's pertinent credentials are: B.S. in Microbiology and B.S. in Chemistry, University of Florida; Ph.D. in Pharmacology, Cornell University; Post-Doctoral Fellow, La Jolla Institute for Allergy and Immunology; Associate with Foley & Lardner (Chemical, Biotechnology & Pharmaceutical Practice/Life Science and Nanotechnology Industry Team). Christopher Holman's pertinent credentials are: B.A. in Chemistry, California State University, Hayward; Ph.D. in Biochemistry and Molecular Biology, University of California, Davis; Post-Doctoral Fellow, Syntex Research/Roche Bioscience; Patent Agent with Flehr Hohbach, LLP; Associate with Pennie & Edmonds, LLP; Associate Patent Counsel with Transgenomic, Inc.; Patent Counsel with Maxygen, Inc.; Vice-President, Intellectual Property with PhyNexus, Inc.

11. These filing dates correspond to the instant patents and do not represent the "earliest priority date" of the patents. However, as shown in Table 1 *infra*, approximately half of these patents were original patents, and thus the filing date for approximately half of the patents also represents the earliest filing date.

type subject matter. After liberally removing those patents not related to antibody composition of matter claims, we were left with 6,407 patents. To ensure consistent coding, a sample of 400 random patents were taken and reviewed by both authors. Review of the 400 random patents resulted in over 90% consistency in classification coding (inclusion or exclusion of non-composition of matter claims). The claims of these 400 random patents were also reviewed to confirm that they were antibody composition of matter claims. Our goal was not to identify every antibody composition of matter patent, but simply to create a dataset that was mostly limited to antibody composition of matter claims.[12]

The antibody dataset consists of mainly antibody composition of matter claims. Specifically, we attempted to eliminate those patents with only claims directed to drug conjugates, pharmaceutical compositions, methods of use, treatment claims, antibody libraries, polyclonal antibodies, transgenic mice used to produce antibodies, kits with antibodies, and expression vectors. We retained patents directed towards antibodies of any isotype (IgE, IgA, IgD, etc.), humanized and chimeric antibodies, bispecific antibodies, antibody fragments, nucleic acids encoding specific antibodies, neutralizing antibodies, engineered antibodies, and recombinant antibodies.

All the data have been grouped by the *first office action date*. This metric is more accurate than the filing date because prosecution dates can change dependent on the examiner's docket and the backlog of patents at the patent office. Accordingly, filing dates can be deceptive because examiners may not pick up the application for long periods after the PTO receives the application. For example, U.S. Patent No. 6,770,466 has a filing date of July 18, 2001.[13] However, the first office action did not occur until June 12, 2003, about two years after the filing date. Therefore, using the first office action date better reflects the state of the law at the time the application was under review by the PTO.

B. THE 1650 CONTROL GROUP DATASET

A second data set was generated to act as a control group (hereinafter *1650 control group*). The 1650 control group includes patents directed towards

12. Several other search strategies failed to result in a dataset of enriched antibody composition of matter claims. Failed searches were based on similar searches directed towards the abstract, summary of the invention, claims, as well as CPC codes.

13. U.S. Patent No. 6,770,446 (issued Aug. 3, 2004).

"fermentation, microbiology, isolated and recombinant proteins/enzymes." This dataset consisted of over 92,000 patents from Workgroup 1650.[14]

Workgroup 1650 was chosen as a control because many of the characteristics of the patents found in workgroup 1640 (the workgroup associated with most antibody patents) could also be found in workgroup 1650. Specifically, many of the traits found in recombinant proteins and recombinant enzymes are similar for antibody claims. For example, recombinant enzymes exhibit functional attributes that are tied to specific structural elements. Similarly, therapeutic antibodies exhibit functional characteristics based on the specific antibody Complementarity Determining Regions (CDRs).[15] Additionally, only nine of the 6,408 antibody patents were found in workgroup 1650, so the overlap between these two datasets is minimal.

Similar to the antibody dataset, the 1650 control group was organized chronologically by the first office action date.

C. THE CLAIM TYPE DATASET

A third data set was generated to examine claim type (hereinafter *claim type dataset*). We randomly sampled 340 independent patent claims from the antibody dataset. We reviewed 20 independent antibody claims ("Claim 1") from each year from 2002-2018. We determined if the antibody claim type was directed to an antibody as described: (1) by binding to a specific antigen (and giving the antigen description/epitope) or (2) structurally by its binding site or specific heavy chain/light chain sequences. Structural limitations were most frequently described as specific sequence identification numbers ("SEQ ID"). These SEQ ID numbers corresponded to either specific amino acid sequences or specific nucleotide sequences, usually corresponding to specific CDR regions.

Antibody claims can be very broad (based only on the description of the antigen) to fairly narrow (based on specific binding regions of the antibody along with a description of the antibody's function or an antibody generated by a specific hybridoma cell line). In general, antibodies can be defined by: (1) reference to the target antigen; (2) the epitope; (3) target antigen and further antibody functional features; (4) antibody and structural features; (5) their own

14. As shown in Section III.C, *infra*, most antibody patents come from Workgroup 1640. Workgroup 1650 was chosen as a control group because this workgroup encompasses patents directed to "Fermentation, Microbiology, Isolated and Recombinant Proteins/Enzymes." Workgroup 1650 contains many of the same types of issues present in Workgroup 1640, which is directed to "Immunology, Receptor/Ligands, Cytokines Recombinant Hormones, and Molecular Biology."

15. For a deeper discussion of CDRs, see *infra* Appendix 1.

structure (amino acid sequences); (6) antibody nucleic acid sequences encoding the antibody; (7) the antibody production process; and/or (8) the hybridoma producing the antibody. In general, this list is ordered from the broadest to the narrowest type of antibody claims.

The broadest patents usually claim antibodies by only referencing the target antigen, without reciting any structural elements for the antibody.[16] In contrast, the narrowest claims reference only the hybridoma that is used to produce the specific antibody, thus giving the complete antibody structure and the means to produce the antibody.[17] In the claim type dataset, we consolidate antibody definitions 1–3 together (antibody defined by antigen structure and no antibody structure) and 4–7 together (antibody defined by its own structure).

D. DATA LIMITATIONS

Because we are working with issued patents, there is a selection issue for recently granted patents with first office action dates of 2019, 2020, or 2021. Specifically, recently filed patents will always have much shorter prosecution histories simply because they have been reviewed by the USPTO and issued very recently. Thus, many of these more recent patents have prosecution histories that are not representative of most patents. Specifically, these patents usually come from large patent families which exhibit anomalous prosecution histories. To minimize this selection effect, we excluded all patents with first actions that occurred after 2019.

IV. RESULTS

First, we find that antibody patents experience many more § 112(a) rejections compared to similar technology. Second, we find that antibody claims have shifted from broad functional claims defined by the antigen to narrower claims defined by the antibody structure. Third, there was a fivefold increase in the number antibody patents granted with a significant decrease in the number of independent claims per patent. Finally, the number of words

16. An example of this broad claim would be, "An antibody that specifically binds X." *See, e.g.*, U.S. Patent No. 7,060,800 col. 185 (issued June 13, 2006).

17. An example of this narrow claim would be, "A hybridoma cell line deposited as ATCC Accession Number X." *See, e.g.*, U.S. Patent No. 7,547,544 col. 62 (issued June 16, 2009). The hybridoma cell line claims are usually the least valuable to firms because they are relatively easy to design around. Specifically, if a competitor develops an independent hybridoma cell line, even if the competitor's hybridoma cell line produces a very similar mAb to the patented hybridoma cell line, it will not infringe the patented cell line.

per independent claim increased from 2002–2018, which also suggests a narrowing of antibody claims over time.

A. CHANGES IN ANTIBODY CLAIMS

Antibody claims and the rejections that patent examiners apply to allow those claims have shifted dramatically from 2002–2018. Three areas of greatest changes are: (1) increased use of § 112(a) rejections, (2) applicants responding by narrowing their claims by adding structural elements that define the antibody, thus changing the type of antibody claims from functional to structural claims, and (3) increased number of words necessary to claim the invention.

1. Increased Number of Written Description/Enablement Rejections

Patent examiners for antibody technology have dramatically increased their use of the written description and enablement rejection. Figure 1[18] shows that from 2003–2006 antibody patents initially received 112(a) rejections only about 20% of the time, almost doubling to 40% by 2018.[19]

A 10-20% rejection rate based on 112(a) is typical of biotechnology patents.[20] As shown in Figure 1B, the 1650 control group does not show a discernible increase in § 112(a) rejections over the same time period. Accordingly, examiners in the 1650 control group only used § 112(a) rejections in the 1650 control group about 20% throughout 2002–2018.

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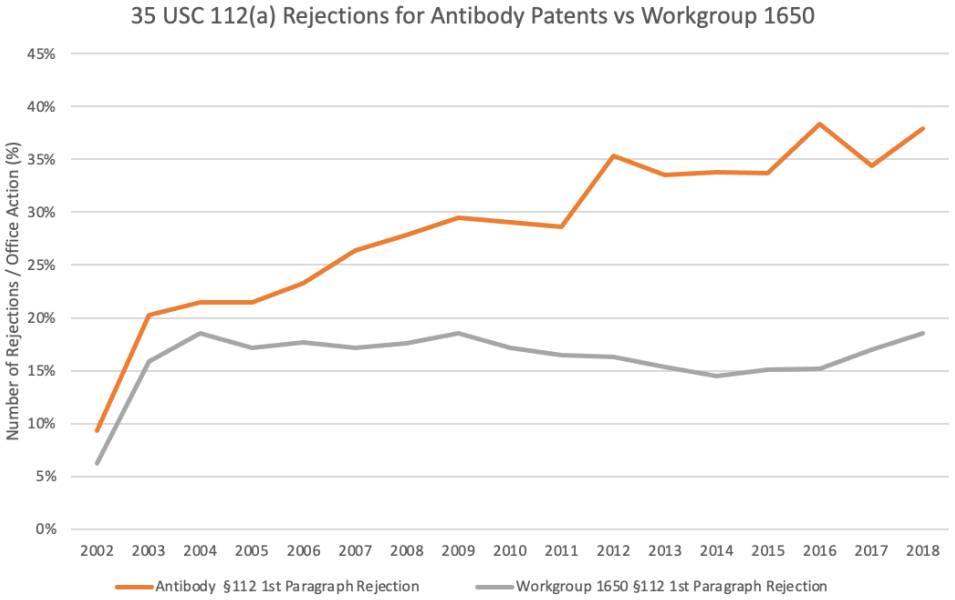
18. These data have been segmented to show the percentage of first office actions with 35 U.S.C. § 112(a) rejections. However, these data are representative of both non-final and final office actions. *See* Appendix 2A and 2B.

19. 35 U.S.C. § 112(a) rejections include both written description and enablement rejections. These two rejections have been cojoined because examiners and applicants often confuse/conflate these two doctrines even though they are separate and distinct requirements. *See, e.g.*, Ex Parte Kim stating, "To the extent the Examiner's rejection implicates the *enablement* requirement of that statute, we decline to speculate in that regard here, for the rejection is based solely on the claimed invention's failure to comply with *the written description* requirement, not the *enablement* requirement which is a separate and distinct requirement under § 112." U.S. Patent Application 15/369,177 BPAI opinion dated April 21, 2022 (emphasis in original); *see also* Ex Parte Palmer stating, "§ 112, first paragraph, contains *a written description requirement separate from enablement*…the rejection here, however, is for lack of adequate written description, *not* lack of enablement." U.S. Patent Application 15/790,961 BPAI opinion dated April 4, 2022 (emphasis in original); *see also* Dennis Crouch, *Enablement at the USPTO*, PATENTLYO (Apr. 25, 2022), https://patentlyo.com/patent/2022/04/enablement-the-uspto.html; *see also* Ariad Pharms., Inc. v. Eli Lilly & Co., 598 F.3d 1336 (Fed. Cir. 2010).

20. *See infra* Figure 4 showing that rate of 112(a) rejections for all technology types is typically below 10%; *see also infra* Figure 1 showing that patents from Workgroup 1650 examiners typically use 112(a) in approximately 20% of their office actions.

Figure 1



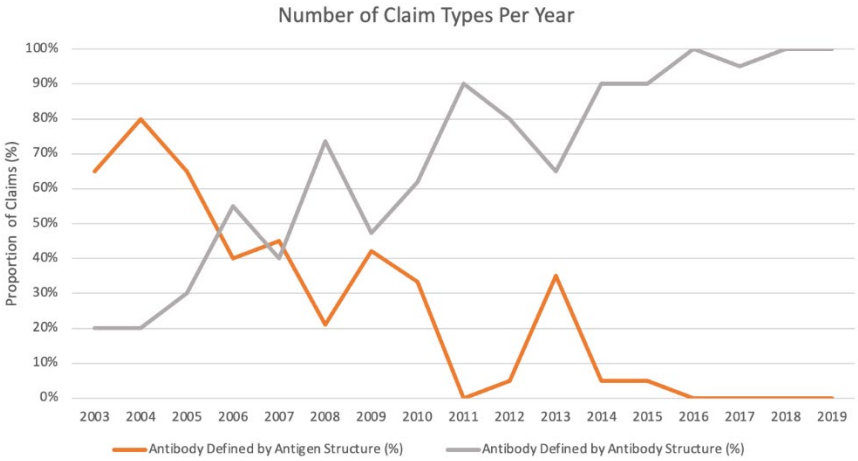
2. *Change in Type of Claims*

The way antibody claims are drafted has also dramatically changed from 2003 to 2019.[21] As shown in Figure 2, in the early 2000s, approximately 70% of the claims were directed to antibodies that were defined only by their antigen or epitope, while about only 30% were defined by structural elements (usually given by the exact amino acid sequence of the six CDRs or the full light chain/heavy chain sequence). By 2011, we saw almost a complete switch. In 2011, almost no antibody claims were characterized only by their antigen binding site, and by the late 2010s, almost 100% of the claims were completely defined by their structural elements.[22]

21. These data were based on the 340 patents from the Claim Type Dataset described *supra* in Section III.B.

22. *See* Examples 1, 2 and 3 *infra* in Section V.A for examples of claim language evolution.

Figure 2



This change in the types of antibody claims allowed by examiners mirrors the increase in the number of words in each claim[23] as well as the increased use of § 112(a) rejections.[24] That is, we see a shift from broad antigen-based functional claims to narrow structural claims in the same time frame in which applicants increase the number of words in their independent claims as well as an increase in the examiner's use of § 112(a) rejections.

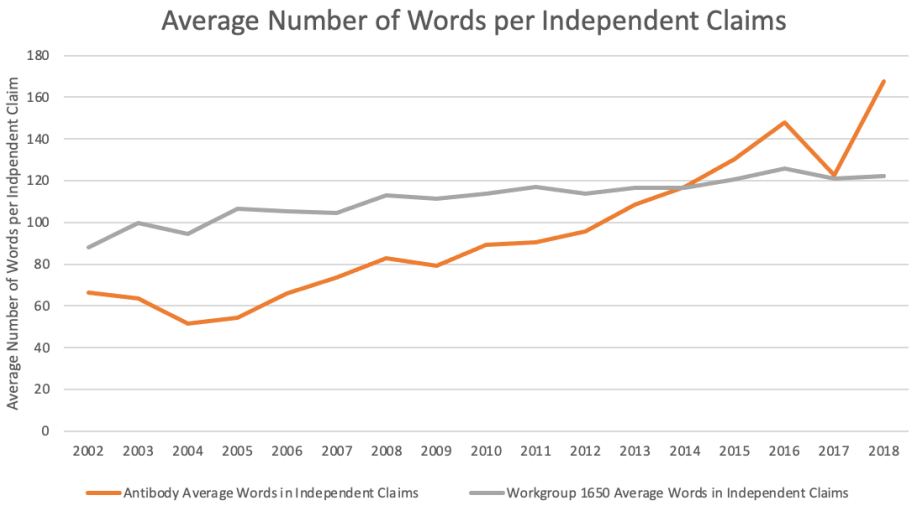
Currently patent examiners do not allow broad antibody claims described only by the antigen. Thus, antibody patents are much narrower because applicants must describe specific structures that correspond to the antibody they are attempting to claim and can no longer claim antibodies based solely on their function (binding to their specific antigen).

3. Increase in the Number of Words Per Independent Claim

In response to the increase in § 112(a) rejections, applicants have been adding more words to their claims. As shown in Figure 3 (orange line), the number of words in each independent antibody claim has almost tripled from 2002 to 2018.[25]

23. *See supra* Section IV.A.3.
24. *See supra* Section IV.A.1.
25. These data were based on the 6,407 patents from the Antibody Dataset described in Section III.A.

Figure 3



B. ANTIBODY PATENT REJECTIONS

Antibody patents differ not only from other patents in Technology Center 1600 (TC 1600), but also from many other technology types. We compare antibodies against all other technology centers. Additionally, we review how examiners use prior art rejections against antibody patents.

1. Antibody Claims in Comparison to Other Technologies

The prosecution histories and rejections used for antibody claims are different from almost every other Technology Center.[26] We compared antibody patents with a first office action in 2018 against patents from all other technology centers. Figure 4 shows that antibody patents do not receive many anticipation (35 U.S.C. § 102) or obviousness (35 U.S.C. § 103) rejections compared to any other Technology Centers (TC).[27] Furthermore, antibody

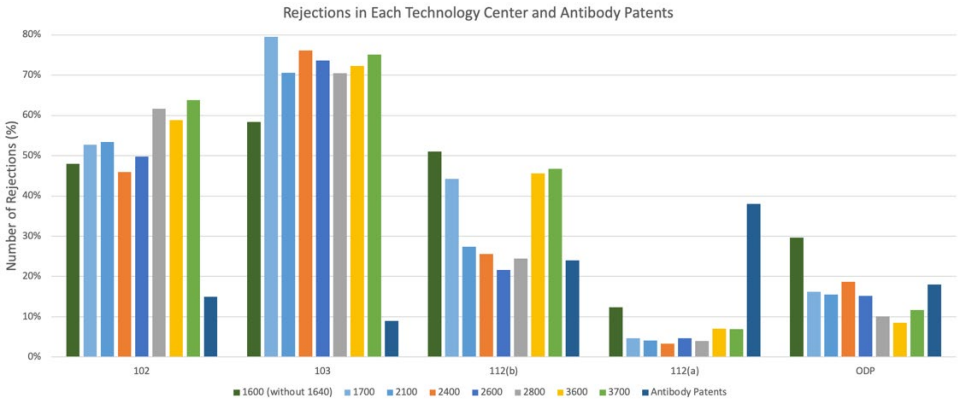
26. Technology Center 1600 includes all patents except those from Workgroup 1640. Workgroup 1640 was excluded out because most antibody patents come from Workgroup 1640, which significantly skewed the results. Workgroup 1640 is the workgroup that contains almost all antibody composition of matter claims, and thus are largely captured in the "antibody patent" segmented data. *See infra* Part II (Figure 7, showing the distribution of all antibody composition of matter patents). For example, Workgroup 1640 alone represents 24% of all 35 U.S.C. § 112(a) rejections from Technology Center 1600 (Figure 4).

27. This includes TC 1600 Biotechnology and Organic Chemistry; TC 1700: Chemical and Materials Engineering; TC 2100 Computer Architecture, Software, and Information Security; TC 2400 Computer Networks, Multiplex Communication, Video Distribution and Security; TC 2600 Communications; TC 2800 Semiconductors, Electrical and Optical Systems and Components; TC 3600 Transportation, Construction, Electronic Commerce, Agriculture,

patents receive fewer indefiniteness rejections (§ 112(b)) compared to TC 1600 (without 1640), 1700, 3600, and 3700. Also, antibody patents receive about the same percentage of Obviousness Type Double Patenting (ODP) rejections. Finally, antibody patents receive the highest number of enablement and written description rejections (§ 112(a)) with about four times as many rejections as the next highest TC.

These data show that § 112(a) is the biggest hurdle to overcome antibody patents. This is surprising because for every other technology group, obviousness is the principal obstacle to receiving a patent.

Figure 4[28]



2. *Other Substantive Rejections and Antibody Patents*

Figures 4 and 5 show that antibody patents do not regularly encounter prior art rejections.[29] When compared to other patents from other technologies, antibody patents face substantially fewer prior art rejections. Other patents in Technology Center 1600, which examines patent applications in the fields of biotechnology and organic chemistry, face obviousness

National Security and License & Review; TC 3700 Mechanical Engineering, Manufacturing, Products; TC 4000 Training Academy.

28. Technology Center 1600 includes all patents except those from Workgroup 1640. Workgroup 1640 was excluded out because most antibody patents come from Workgroup 1640, which significantly skewed the results. Workgroup 1640 is the workgroup that contains almost all antibody composition of matter claims, and thus is largely captured in the "antibody patent" segmented data.

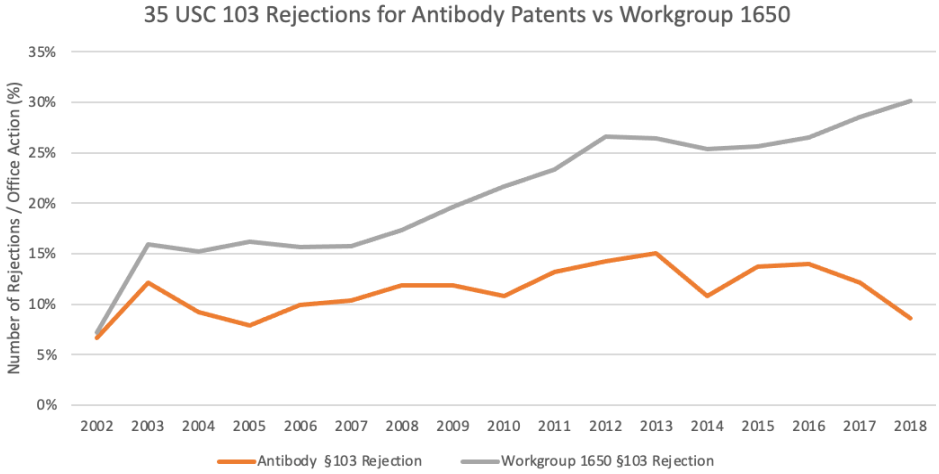
29. Figure 5 data have been segmented to show the percentage of first office actions with 35 U.S.C. § 103 rejections. However, these data are representative of both non-final and final office actions. *See infra* Appendix 3A and 3B.

rejections approximately five times more frequently than antibody patents (Figure 4). This is significant because obviousness prior art rejections are usually the most difficult rejections to overcome during prosecution and litigation.[30]

Additionally, as shown in Figure 5, the number of obviousness rejections (§ 103) in the 1650 control group steadily increases to about twice the number (25–30%) found in the antibody group, which stays at around 10–15%. This is interesting because most of the time when a technology type evolves, the art becomes more crowded and more inventions in the same technology group become obvious over prior art. This is not true for antibody patents, which seem to have a steady state for obviousness rejections. In contrast, the 1650 control group does follow the expected trend of increased obviousness rejections as we move through time.

This trend for obviousness rejections (§ 103), however, does not translate to novelty rejections (§ 102). Both the antibody group and the 1650 control group experience approximately a 20% rejection rate based on § 102.[31]

Figure 5



Antibody patents and the 1650 control group encounter indefiniteness (§ 112(b)) and obviousness-type double patenting (ODP) rejections (35 U.S.C.

30. *See* S. Sean Tu, *supra* note 4; *see also* S. Sean Tu & Mark A. Lemley, *What Litigators Can Teach the Patent Office About Pharmaceutical Patents*, 99 WASH. U. L. REV. 1673 (2022) (Figure 6 showing that when an Orange Book patent is invalidated, it is usually done based on obviousness arguments.).

31. *See infra* Appendix 4.

§ 101) at approximately the same rates.[32] These data are unsurprising because both antibody patents and 1650 control patents have fewer claims with an increasing number of patents filed per year (Figure 8 and Figure 9). The ODP rejection data suggest that applicants are filing more patents relating to the same product, which seems to be a common strategy in this sector.[33]

3. Allowance Rates of Antibody Patents

As shown in Figure 6, from 2008–2010, there was a lower allowance rate (32% as compared to 52%) for Workgroup 1640 patents compared to Workgroup 1650.[34] However, that difference quickly diminished from 2011–present. Currently, the overall allowance rates of patents from Workgroup 1640 do not differ dramatically from Workgroup 1650. These allowance rates correspond with the increased use of § 112(a) rejections as well as the change in antibody claims from claims based on antigen structure to claims based on antibody structure.[35]

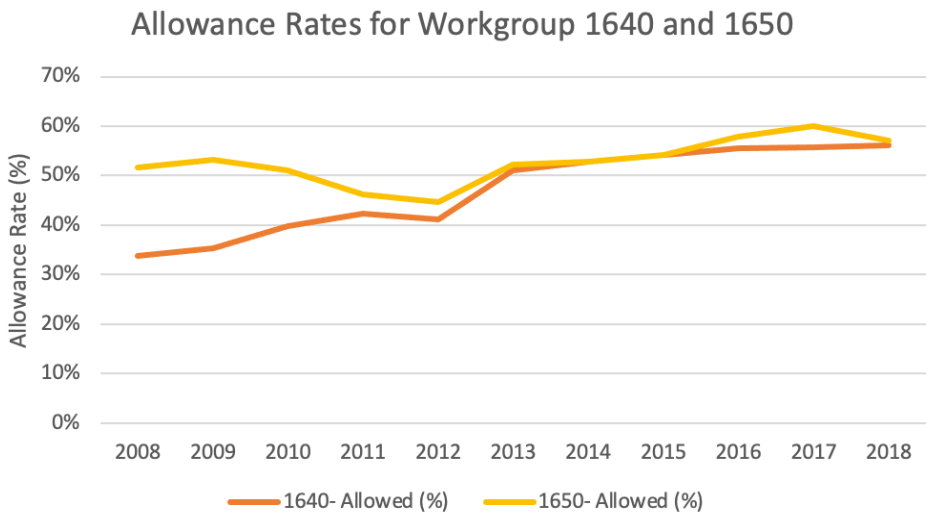
32. *See infra* Appendix 5 and 6 for comparison of antibody versus 1650 control 35 U.S.C. § 112(b) and ODP rejections respectively.

33. Tu & Lemley, *supra* note 30, at 1702 (showing that, for litigated Orange Book patents, pharmaceutical firms file numerous "secondary" patents directed towards the same product, and that the obviousness-type double patenting rejection is one of the most common rejections found for these types of patents); s*ee also* Robin Feldman, *May Your Drug Price be Evergreen*, J.L. & BIOSCIS. 590 (2018).

34. We used Workgroup 1640 as a proxy for antibody patents because most antibody patents come from this workgroup. Additionally, because the antibody patent dataset contains only allowed antibody patents, our dataset did not include those antibody applications that did not mature to patents.

35. *See supra* Figures 1 and 2.

Figure 6



C. CHANGES IN ANTIBODY PATENT PROSECUTION PRACTICE

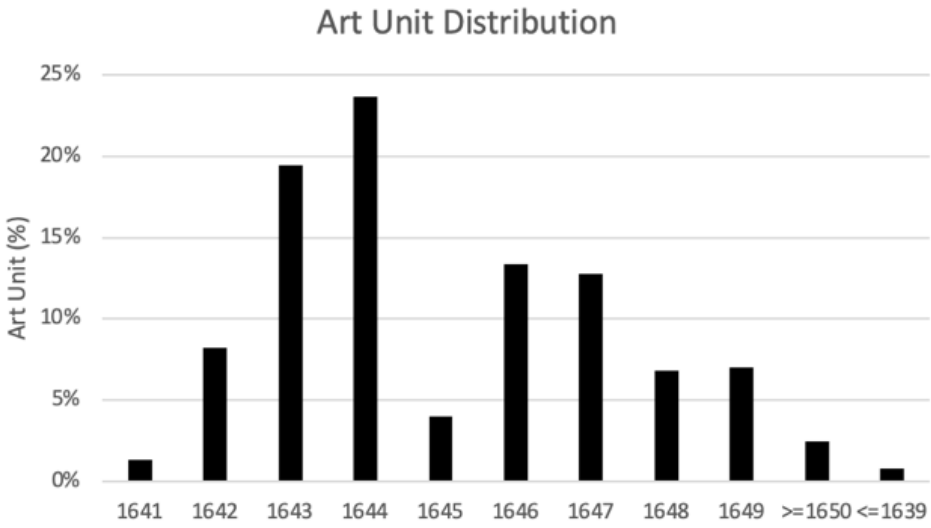
There have also been several important changes in prosecution practice that have also evolved in the past two decades. First, applicants have increased the number of antibody patents they file over time. Second, there has been a decrease in the number independent claims per patent over time. Finally, antibody patents are going through prosecution faster than their older counterparts.[36]

As an initial matter, 98% of the antibody patents were found in Workgroup 1640. Specifically, Figure 7 shows that Art Units 1643 and 1644 contained the lion's share of antibody patents. Patents in Workgroup 1640 are directed to "Immunology, Receptor/Ligands, Cytokines Recombinant Hormones, and Molecular Biology." Art Units 1643 and 1644 include inventions directed to "peptides or proteins, lignins or reaction products thereof" and "drug, bio-affecting and body treating compositions."[37]

36. This shorted prosecution time is not due to the backlog of examined patents. This is because we start our measurement from the date of the first office action and not the filing date.

37. USPTO, CLASSES ARRANGED BY ART UNIT (NOV. 2022), https://www.uspto.gov/sites/default/files/documents/caau.pdf.

Figure 7[38]



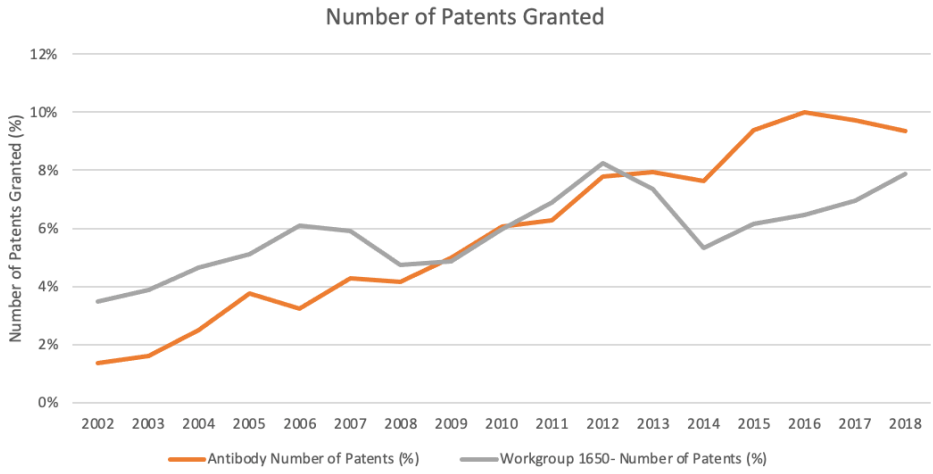
1. Increasing Number of Antibody Patents

Figure 8 shows that the number of antibody composition of matter patents has steadily risen from only 75 granted (1% of total) with a first office action date in 2002 to a steady state of over approximately 500 antibody patents (10% of total) in 2018.[39] Unsurprisingly, as antibodies became increasingly used as therapeutics, and therefore more valuable, more firms moved towards the patent system to protect their inventions. There is a similar increase in the absolute number of patents in the 1650 control group. However, in the 1650 control group, we only see a twofold increase in the number of patents, while there is a fivefold increase in the antibody group.

38. Art Unit (AU) 1641 includes "Peptide or Protein Sequence"; AU 1642 includes "Drug, Bio-Affecting and Body Treating Compositions"; AU 1643 and 1644 include "Drug, Bio-Affecting and Body Treating Compositions" and "Chemistry: Natural Resins or Derivatives; Peptides or Proteins; Lignins or Reaction Products Thereof"; AU 1645 includes "Drug, Bio-Affecting and Body Treating Compositions" and "Chemistry: Molecular Biology and Microbiology"; AU 1646 includes "Drug, Bio-Affecting and Body Treating Compositions" and "Peptide or Protein Sequence"; AU 1647 includes "Drug, Bio-Affecting and Body Treating Compositions"; AU 1648 includes Drug, Bio-Affecting and Body Treating Compositions" and "Chemistry: Molecular Biology and Microbiology"; and AU 1649 includes "Drug, Bio-Affecting and Body Treating Compositions" and "Multicellular Living Organisms and Unmodified Parts Thereof and Related Processes." https://www.uspto.gov/sites/default/files/documents/caau.pdf (last visited March 19, 2023).

39. These data were based on the 6,407 patents from the Antibody Dataset described *supra* Section III.A.

Figure 8

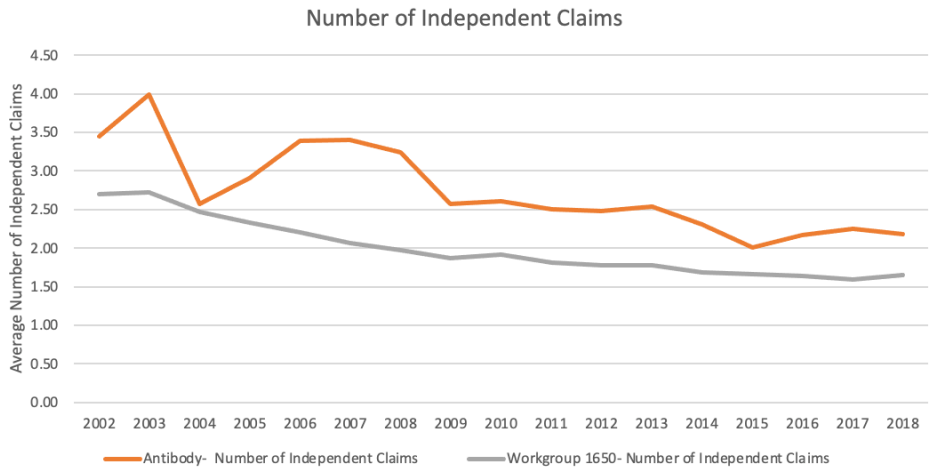


2. Fewer Claims Over Time

As shown in Figure 9, the number of independent claims in antibody patents has decreased from an average of about 3.5 claims in 2002 to just over two claims in 2018.[40] Thus, currently, more patents are being granted with fewer independent claims. Figure 9 also shows that the number of independent claims is reduced in the 1650 control group. However, the magnitude of the change is less dramatic, moving from approximately 2.5 independent claims in 2002 to just over 1.5 independent claims in 2018.

40. These data were based on the 6,407 patents from the Antibody Dataset described *supra* Section III.A.

Figure 9



3. Fewer Original Patent Filings Over Time Compared to the 1650 Control

As shown in Figure 10A, fewer "original" patents were granted early (2002–2005), but that number almost doubled over time.[41] An "original" patent is defined as a patent that does not claim priority to another patent. Specifically, in 2002–2005 only approximately 30% of granted patents were original filings. However, by 2009–2018, the number of granted patents that were original filings increased to about 50%. In contrast, both divisional ("DIV") and continuation ("CON") patents, for the most part, stayed at approximately 20–25% while continuation-in-part (CIP) patents stayed at around 5% throughout 2006-2018.

In contrast, Figure 10B shows that, for the 1650 control, the number of granted patents that were original filings stayed constant at around 60% through 2002–2018. Additionally, DIVs and CONs stayed at around 15–20% while CIPs also stayed at around 5%.

41. These data were based on the 6,407 patents from the Antibody Dataset described *supra* Part III.A.

Figure 10A

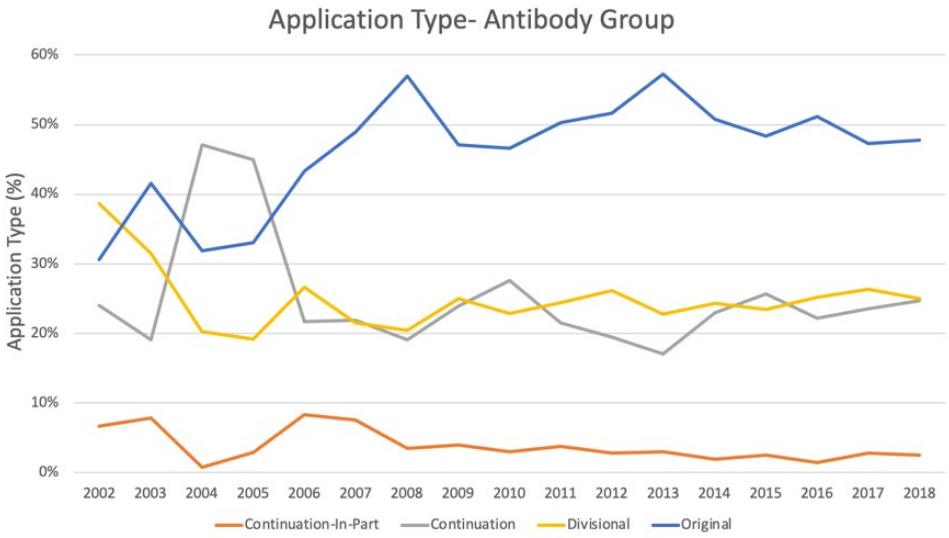


Figure 10B

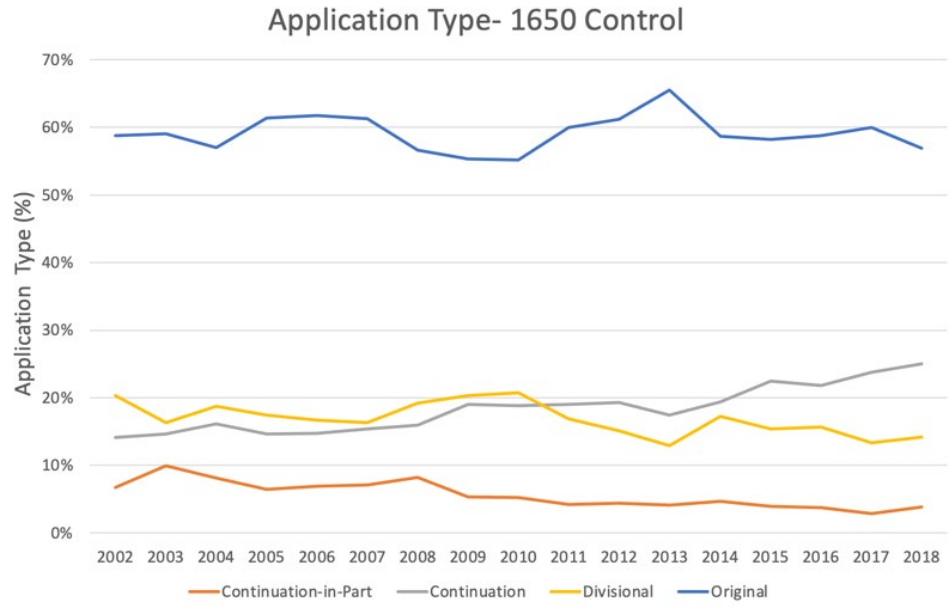


Table 1 shows the overall data where the data is not segmented by year. Additionally, Table 1 includes the percentage of applications with restriction requirements. These data show that antibody patents claim priority to another application and have fewer original patents compared to the 1650 control

group. Although the antibody dataset has more divisional patents, they experience about the same number of restriction requirements as the 1650 control group.

Table 1

	Antibody Dataset	1650 Control
Continuing Applications[42]	52%	41%
Continuation-in-Part Patents	3%	5%
Continuation Patents	25%	20%
Divisional Patents	24%	16%
Original Patents	48%	59%
Restriction Requirements	67%	63%

4. Shorter Patent Prosecution Duration Over Time

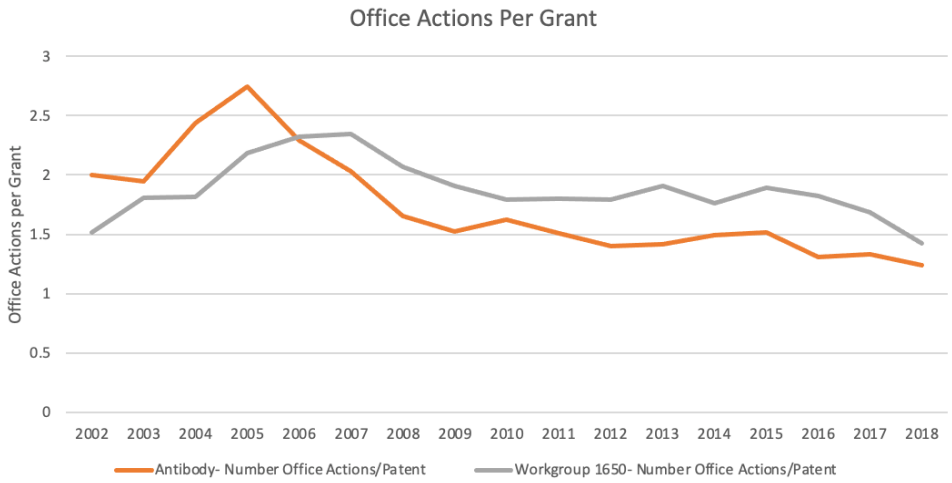
The patent prosecution profile has also changed for antibody patents over time. This shortened patent prosecution time is not due to the decreased backlog of patent applications. Rather, it is because we start measuring the prosecution duration from the date of the first office action and not the filing date of the application.

First, as shown in Figure 11 (orange line), the number of office actions per antibody patent has decreased from approximately 2.5 in the early 2000's to only 1.2 office actions per patent in 2016–2018. In contrast, as shown in Figure 11 (grey line), the number of office actions in the 1650 control group remains relatively steady at 1.8 office actions per patent throughout the 2002–2018 timeframe.[43] Thus, the back-and-forth negotiations between the examiner and the applicant for antibody patents are far fewer now than two decades ago.

42. A "continuing application" is a continuation, divisional, or continuation-in-part application. MPEP § 201.02.

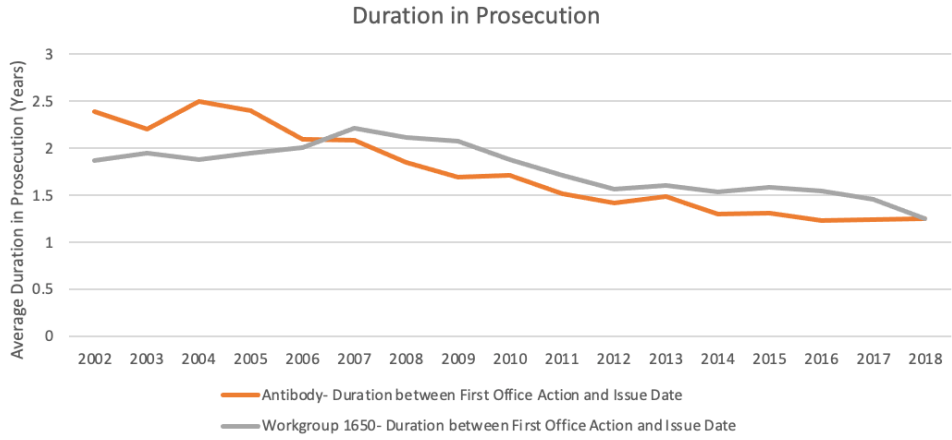
43. The number of Office Actions per Grant corresponds to the Office Action per Grant Ratio (OGR score). *See* S. Sean Tu, *Three New Metrics for Patent Examiner Activity: Office Action per Grant Ratio (OGR), Office Actions per Disposal Ratio (ODR), and Grant Examiner Ratio (GER)*, 100 J. PAT. & TRADEMARK OFF. SOC'Y 277 (2018); S. Sean Tu, *Bigger and Better Patent Examiner Statistics*, 59 IDEA 309 (2018).

Figure 11



This naturally corresponds to the duration of prosecution. Figure 12 (orange line) shows that in the early 2000's patent prosecution would customarily take about 2.5 years and fell to about only 1.2 years from 2016–2018. There is a similar decrease in patent prosecution duration in the 1650 control group, shown in Figure 12 (grey line). However, the magnitude of this decrease is much smaller for the 1650 control group, moving from about 1.8 years to 1.5 years.

Figure 12



V. DISCUSSION

The caselaw around antibody patents, specifically around the written description and enablement requirements, has evolved in the past two decades.[44] The PTO has attempted to track the changes in caselaw with their own guidance around antibody patents. In this Section, we interpret the empirical results by placing these results in the context of the time-dependent PTO policy and Federal Circuit caselaw on antibody patents.[45]

A. CHANGE IN CLAIM TYPE

The increase in 112(a) rejections faced during prosecution supports the idea espoused by Judge Lourie, specifically that "[w]hat is new today is not the law, but generic claims to biological materials that are not fully enabled."[46] These data are also consistent with findings by other commentators that non-ANDA pharmaceutical patents face higher invalidation rates based on § 112(a) during litigation.[47]

Applicants have changed from broad functional genus claims defined by the antigen alone to narrower claims defined by the antibody's structure (Figure 2). Below we describe the evolution of these claims and develop a hypothesis of how the changing nature and uses for antibodies resulted in a shift in antibody claiming practice.

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44. For a complete discussion of the historical changes in USPTO policy and Federal Circuit jurisprudence on antibody patents, see S. Sean Tu & Christopher Holman, *Antibody Claims and the Evolution of the Written Description and Enablement Requirement*, IDEA (2022).

45. *See id.*

46. Amgen Inc. v. Sanofi, Aventisub LLC, 850 F. App'x 794, 795 (Fed. Cir. 2021) (also stating that, "in order to have invented a genus, one needs to have invented species that constitute the genus. Drawing a broad fence around subject matter, without filling in the holes, is not inventing the genus. It in fact discourages invention by others. If one has disclosed or enabled only a small number of invented species, then one has not invented a broad genus. Invention of a genus means to conceive and reduce to practice a reasonable number and distribution of species constituting the genus. Mere statement of a genus does not demonstrate that one has invented a generic concept, without the enablement of constituent species.")

47. John R. Allison & Lisa Larrimore Ouellette, *How Courts Adjudicate Patent Definiteness and Disclosure*, 65 DUKE L.J. 609, 666 (2016) (Table 7 showing that non-ANDA pharmaceutical patents are the worst performers on written description of any industry); *see also* Jackob S. Sherkow, *Describing Drugs: A Response to Professors Allison and Ouellette*, 65 DUKE L.J. 127, 128 (2016). *But cf.* Dmitry Karshtedt, Mark A. Lemley & Sean B. Seymore, *The Death of the Genus Claim*, 35 HARV. J.L. & TECH. 1, 4 (2021) (showing that only a small minority of Federal Circuit decisions have upheld a genus claim in the chemical industry over the past thirty years).

1. *Early Antibody Claims: Functional Antibody Claims Defined by Antigen Structure Only*

During this early period monoclonal antibodies were mainly used as research and diagnostic tools and not as therapeutic agents. These mouse antibodies were only used to determine if an antigen was present. It did not matter where the antibody bound, i.e., what the specific epitope was, nor the type of antibody. It only mattered if the antibody did or did not bind to the antigen.

This binary decision (binding vs. non-binding) was consistent with broad patent protection based on antigen structure alone because, during this time period, the value of the antibody rested primarily in the antibody's ability to bind and detect the antigen. Accordingly, during this early phase in monoclonal antibody development, an applicant could receive a broad functional patent by simply characterizing the antigen (without giving any structural elements of the antibody itself).[48]

As shown in Figure 1, during this early stage, 112(a) was not used frequently to reject antibody patents. Additionally, as shown in Figure 2, during this time period, the majority of these antibodies were claimed by using functional language and only describing the antigen. These genus claims did not define the antibody structurally, but instead by defining the antigen that the antibody could bind to specifically. During this time period, we also see epitope claims (binding to a specific area of the antigen) and epitope claims with specific binding affinity requirements. The patentee was only required to disclose the antigen's structure. The resulting broad scope of antibody claims was logical during this period of antibody development because antibodies were being used primarily as research or diagnostic tools.

Example 1 is typical of an antibody patent during this timeframe. No antibody structure is given in the '800 patent. The antibody is only defined by the antigen (SEQ ID NO: 9). This claim is relatively short (only eighteen words) because it defines the antibody only by the antigen that it binds.

48. Tu & Holman, *supra* note 44; *see also* USPTO, WRITTEN DESCRIPTION TRAINING MATERIALS 4546 (2008).

Example 1 – US Patent No. 7,060,800[49]

> Claim 1: An isolated antibody or antigen binding fragment thereof, which specifically binds to a polypeptide of SEQ ID NO:9.[50]

2. *Replacing Broad Genus Claims: Antibody Claims Defined by Antibody Complementarity Determining Regions (CDRs)*

During this period, monoclonal antibodies began to be used as therapeutic agents. However they faced many issues due to the human anti-mouse antibody (HAMA) response.[51] Accordingly, these early therapeutics suffered major setbacks at the FDA and oftentimes did not work well as human medicines. For example, the mouse monoclonal antibody OKT3 was one of the first antibodies approved for the reversal of acute kidney, cardiac, and liver transplant rejection.[52] However, OKT3 treatment was severely limited due to the HAMA response and the first dose reaction which caused side effects such as fever, chills, dyspnea, tachycardia, emesis, and diarrhea.[53]

The USPTO and courts narrowed claims due to the new therapeutic uses for antibodies, as well as the realization that binding to different epitopes could have dramatically different functional effects on the body. Courts began to apply a stricter version of the *Lilly* written description requirement, requiring applicants to describe their antibodies using structure instead of function.[54] Antibody claims changed as the USPTO and courts began to reject and invalidate claims based only on antigen structure. Accordingly, during this time period, examiners began using § 112(a) more frequently to reject antibody claims that were directed towards functional genus claims and started forcing applicants to define antibody structures.

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49. U.S. Patent No. 7,060,800 (issued June 13, 2006).

50. SEQ ID NO:9 is a human TNF-x protein that is 228 amino acids. U.S. Patent No. 7,060,800, col. 57–59 (issued June 13, 2006).

51. These negative effects are based on the fact that the human body recognizes the mouse antibody as foreign; *see also infra* Appendix 1 for deeper discussion of HAMA response.

52. *See* Bohua Li, Hao Wang, Jianxin Dai, Junjie Ji, Weizhu Quian, Dapeng Zhang, Sheng Hou & Yajun Guo, *Construction and Characterization of a Humanized Anti-Human CD3 Monoclonal Antibody 12F6 with Effective Immunoregulation Functions*, 116 IMMUNOLOGY 487, 488 (2005).

53. *See, e.g.*, Nadim Mahmud, Dusko Klipa & Nasimul Ahsan, *Antibody Immunosuppressive Therapy in Solid-Organ Transplant*, 2 MABS. 148, 151–52 (2010) (showing that OKT3's "adverse effects proved to be consistently problematic.").

54. Christopher M. Holman, *Is Lilly Written Description a Paper Tiger?: A Comprehensive Assessment of the Impact of Eli Lilly and Its Progeny in the Courts and PTO*, 17 ALB. L.J. SCI. & TECH. 1, 18–19 (2007); *see also* Tu, *supra* note 43.

In response to these rejections, applicants drafted and were issued claims that specifically defined the antibody based on structural elements.[55] These claims usually focused on the CDRs, which are the antibody structural elements that define the binding site of the antibody to the antigen.[56] There are six CDRs for each antigen receptor that can come into contact with the antigen. Each CDR binding site is usually defined by 3-15 amino acids. Thus, many antibody claims during this time period require at least 50–60 amino acids spread among the six CDRs (usually six individual SEQ IDs).

Example 2 is a typical antibody claim during this timeframe. The antibody CDRs are now given as the key structural elements that define the invention. These CDRs, however, are based on relatively short amino acid sequences. Accordingly, even with defined CDR structural elements, these antibody claims still can be broad.

Example 2 – US Patent No. 9,353,181[57]

> Claim 1: An isolated IL-23p19 antibody, comprising a light chain variable region and a heavy chain variable region, said light chain variable region comprising: a complementarity determining region light chain 1 (CDRL1) amino acid sequence of SEQ ID NO:50; a CDRL2 amino acid sequence of SEQ ID NO:56; and a CDRL3 amino acid sequence of SEQ ID NO:73, said heavy chain variable region comprising: a complementarity determining region heavy chain 1 (CDRH1) amino acid sequence of SEQ ID NO:5; a CDRH2 amino acid sequence of SEQ ID NO:28; and a CDRH3 amino acid sequence of SEQ ID NO:44.[58]

3. Narrow Species Claims: Antibody Claims Defined by Complete Antibody Structure

Presently, many antibodies are defined by both their variable and framework (constant) regions. Accordingly, most antibody claims currently include an almost complete description of the entire antibody structure, and not just the CDR regions. It has also helped that technology has advanced so that it is much easier to obtain the protein sequence for larger molecular

55. *See supra* Figure 2.

56. CDRs are the crucial antibody structural elements that confer antibody specificity. *See infra* Appendix 1 for Antibody Technology primer.

57. U.S. Patent No. 9,353,181 (issued May 31, 2016).

58. SEQ ID Nos. 50, 56, 73, 5, 28 and 44 are 14, 7, 11, 5, 17, and 8 amino acids in length, respectively. *See* U.S. Patent No. 9,353,181, col. 93–117 (issued May 31, 2016).

entities such as antibodies. Previously it was time consuming and costly to obtain the primary structure of an antibody.

The current state of monoclonal antibody technology relies on chimeric antibodies and antibody "humanization" to overcome the deleterious effects of the HAMA response. By using recombinant DNA, scientists can now create an antibody that is mostly (or entirely) human. These chimeric and humanized antibodies are used for therapeutic purposes. Thus, for humanized antibodies, both the CDR structure as well as the framework structures are important. Unlike previous antibody iterations, however, the DNA structures are known for humanized antibodies. Accordingly, the primary structure of these antibodies can be well defined.

Example 3 – US Patent No. 10,822,397[59]

> Claim 1: An isolated antibody or epitope-binding fragment thereof that specifically binds to at least one conformational (non-linear) epitope of enterovirus 71 (EV71), wherein the antibody comprises at least one variable light chain and at least one variable heavy chain, wherein the variable light chain comprises an amino acid sequence comprising the amino acid sequence set forth in SEQ ID NO: 3, and wherein the variable heavy chain comprises an amino acid sequence comprising the amino acid sequence set forth in SEQ ID NO: 4 or SEQ ID NO: 5, wherein the antibody or epitope-binding fragment thereof is neutralizing.[60]

Example 3 is a typical antibody claim during this timeframe. The claim contains an almost complete antibody structure. Both the heavy and light chains are structurally defined. Additionally, the amino acid sequences given are between 112–122 amino acids long. Furthermore, this antibody has the functional requirement of being "neutralizing." Thus, these claims are much narrower because the structure of antibody is defined with much more specificity and includes additional functional requirements.

B. INCREASING USE OF § 112(A)

We find that antibody examiners have increased the use of § 112(a) to reject antibody patents since 2006 (Figure 1A).[61] Additionally, § 112(a) is the

59. U.S. Patent No. 10,822,397 (issued Nov. 3, 2020).

60. SEQ ID Nos. 3, 4 and 5 are 112, 122, and 119 are amino acids in length, respectively. U.S. Patent No. 10,822,397, col. 33–35 (issued Nov. 3, 2020).

61. *See supra* Figure 1 (showing an almost 100% increase in the use of 112(a) from 2006 to 2018).

major hurdle that applicants must overcome before receiving an antibody patent (Figure 4).[62]

Beginning in 2006, patent examiners were ignoring their own PTO written description guidelines by increasingly applying a more stringent § 112(a) standard.[63] Examiners applied this more stringent standard even when courts had specifically upheld the PTO's written description antibody guidelines.[64]

We argue that patent examiners were able to look beyond case law and consider the intent of § 112(a) through the lens of how the technology was being used.[65] Accordingly, patent examiners from 2006–2018 were applying 112(a) in a manner that was contrary to the USPTO training materials.[66] Interestingly, both the courts and the USPTO ended up concurring with patent examiners. However, this concurrence took over a decade and came once the issue was squarely before the court.

Why have patent examiners been applying a different standard than what was expected from the USPTO training guidelines and legal precedent? We believe it is because examiners were following the science and advances in antibody technology. Patent examiners are trained scientists and not trained

62. *See supra* Figure 4 (showing that antibody patents experience 10-fold more 112(a) rejections compared with any other technology center and that 112(a) is the major obstacle to obtaining an antibody patent compared with other technology centers where 103 rejections are the primary obstacle).

63. USPTO, *supra* note 48 at 45–46 (Example 13, showing that a claim directed towards "[a]n isolated antibody capable of binding to antigen X" can satisfy the written description requirements of 35 U.S.C. § 112). We note that our data does not distinguish between the written description or enablement guidelines. However, this is consistent with the 2008 written description guidelines put out by the USPTO because it would be illogical to put out a guidance that gives an example that satisfies the written description requirement while simultaneously failing the enablement requirement (without specifically stating that in the guidelines).

64. *See* Enzo Biochem v. Gen-Probe, Inc., 323 F.3d 956, 964 (Fed. Cir. 2002) (stating "[w]e are persuaded by the Guidelines on this point and adopt the USPTO's applicable standard for determining compliance with the written description requirement."); Noelle v. Lederman, 355 F.3d 1343, 1349 (Fed. Cir. 2004) (in holding no interference-in-fact "[t]he court adopted the USPTO Guidelines as persuasive authority for the proposition that a claim directed to 'any antibody which is capable of binding to antigen X' would have sufficient support in a written description that disclosed 'fully characterized antigens.' "); Centorcor Ortho Biotech, Inc. v. Abbott Labs, 636 F.3d 1341, 1351–52 (2011) (stating that "an applicant can claim an antibody to novel protein X without describing the antibody when (1) the applicant fully discloses the novel protein and (2) generating the claimed antibody is so routine that possessing the protein places the applicant in possession of an antibody.").

65. Tu & Holman, *supra* note 44.

66. USPTO, *supra* note 48.

lawyers.[67] We find that in Technology Center 1600, approximately 20% of examiners have masters degrees and approximately 50% have Ph.Ds. in some natural science degree.[68] In contrast, most examiners do not have a traditional legal education, with only approximately 10% having a J.D. in Technology Center 1600.[69]

By 2018, the USPTO ended up conforming with examiners and repealing its previous guidance stating that, "[Example 13 of the 2008 Written Description Training Materials]…*should not be used* in determining whether there is adequate written description under § 112(a) for a claim drawn to an antibody."[70] Although it took over a decade for the courts and USPTO to catch up with patent examiners, both the Federal Circuit and the USPTO now espouse the same standards that patent examiners were applying for over a decade.

C. NARROWING CLAIM SCOPE

The number of words in each claim is important because previous studies have shown that increasing word counts in a claim correlates with narrower scope.[71] We find a threefold increase in the number of words in independent claims for antibody patents. Specifically, there was an increase from 60 to approximately 180 words per independent claim. (Figure 3A) This is unsurprising because the most common ways to traverse a § 112(a) rejection is to simply make claim amendments.[72] Narrowing claim amendments almost always require the applicant to add words.

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67. All examiners are required to have a science degree in their field. Accordingly, 100% of patent examiners will have a Bachelor of Science degree, however, many examiners have also obtained graduate degrees. *See Become a Patent Examiner*, USPTO. https://www.uspto.gov/jobs/become-patent-examiner (last visited Nov. 21, 2021).

68. *See* S. Sean Tu, Paul R. Gugliuzza & Amy Semet, *Overqualified and Underrepresented: Gender Inequality in the Pharmaceutical Patent Field*, 48 BYU L. REV., 137, 173 (2022) (Table 1, showing the different education levels of examiners).

69. *See id* at 155. Examiners are trained extensively in patent law during their first four months in the USPTO training academy.

70. Memorandum from Robert W. Bahr, USPTO Deputy Comm'r for Pat. Examination Pol'y, Clarification of Written Description Guidance for Claims Drawn to Antibodies and Status of 2008 Training Materials (Feb. 22, 2018) (emphasis added).

71. Jeffrey M. Kuhn & Neil Thompson, *How to Measure and Draw Causal Inferences with Patent Scope*, 26 INT'L J. ECON. BUS. 5, 6 (2019) (showing that "a patent's scope can be measured by counting the number of words in its first claim, with more words corresponding to less scope").

72. S. Sean Tu. Patenting Fast and Slow: Examiner Rejections and Applicant Traversals to Nonprior Art Rejections, 2021 Mich. St. L. Rev. 411, at 462, Figure 7 (showing the most common response to either a written description or enablement rejection are claim amendments).

These data also match the general trends that we identify where patent examiners initially allowed broad claims in the early development of antibody technology (which requires few words) and then changing to only allow narrow claims as therapeutic antibodies were developed (which requires many more words to describe all six CDRs or the complete heavy and light chains). For instance, Example 1 is relatively short and has only eighteen words. In contrast, Examples 2 (with approximately 50 amino acids described) and Example 3 (with approximately 120 amino acids described) have five times more words with 96 and 97 words respectively. The increase in the number of words combined with the fact that antibodies are now being defined by their structure (instead of their antigen) suggests a much narrower antibody claim today compared to 2002.

We show that applicants are obtaining more and more antibody patents over time, finding a fivefold increase in antibody patents over the course of this seventeen-year period. Of course, this correlates with the ever-increasing importance of biologics as therapeutics. Although applicants are filing more patents, there are fewer claims per patent and those claims are much narrower in scope.

Additionally, we find that more and more of these patents are coming from the same family of patents as outlined by the tenfold increase in ODP rejections, which can only be used for patents within the same family (Appendix 6).[73] These data argue that many of these patents are directed to the same antibody product or have relevant family members.

Similar to putting together a jigsaw puzzle with only half the pieces, firms could be cobbling together many narrow patents to try and achieve the same broad patent scope that they were previously able to attain with one genus patent.[74] See, for example, the Humira family of patents that purportedly

73. Here a patent is determined to be in the "same family" by the presence of an ODP rejection, which requires: (1) a common inventor or owner, (2) the application at issue must be obvious in view of the subject matter claimed, and (3) no restriction requirement that resulted in the subject matter at issue being pursued in a separate divisional application. *See* MPEP § 804.

74. *See, e.g.*, the Humira Patent family with over 100 associated patents. Ryan Knox and Gregory Curfman. The Humira patent thicket, the Noeer-Pennington doctrine and antitrust's patent problem. 40 Nature Biotechnology 1761 (2022); *see also* Jeffrey Wu & Claire Wan-Chiung Cheng, *Into the Woods: A Biologic Patent Thicket* Analysis, 19 CHI. KENT J. INTELL. PROP. 93, 129 (2021) (describing patent thickets as overlapping patents covering a single technology); Rachel Goode & Bernard Chao*, Biological Patent Thickets and Delayed Market Access to Biosimilars, An American Problem*, J.L. & BIOSCIS. 1, 4 (2022) (discussing how patent thickets can impede biosimilar commercialization).

contains over 150 patents covering similar products.[75] Many of these patents contain antibodies that have been defined by different CRDs or by their heavy and light chain framework regions.

Some commentators have expressed concern that large patent thickets have delayed biosimilar market entry.[76] Others argue that the pendulum has swung too far, and that applicants are now inappropriately being denied genus claims.[77] It is possible that innovators have responded to the narrowing scope of antibody patents by obtaining a larger number of patents with relatively narrow claims.

Examiners seem to be narrowing the scope of antibody claims, which has allowed examination times to speed up. Patentees have responded by filing more and more patents in an attempt to piece together a larger scope. This has created the unexpected market effect of encouraging and causing the formation of "patent thickets."[78] Goode and Chao recently found that nine to twelve times as many patents are asserted against biosimilars in the US compared to Canada and the UK, respectively.[79] At the same time, biosimilars enter the UK and Canadian markets more quickly than they do in the US. Goode's data suggest that patent thickets are delaying biosimilar entry in the US.

D. SPEEDING UP PROSECUTION

In 2002, antibody patents took about 30 months to go through prosecution, but that time has been reduced to only 14 months in 2018.[80] Correspondingly, the number of office actions required to obtain a patent was also cut in half over this seventeen-year period.[81] The overall patent pendency across all technologies at the USPTO has decreased from 31 months to about

75. *See, e.g.*, Humira patents: U.S. 8,414,894 (claim 61, 68, 76, defining both the LCVR and HCVR); U.S. 8,372,401 (claim 1 defining an almost complete heavy and light chain region); *see also* Wu & Cheng, *supra* note 74, at 130 (Table 5, finding more than 154 patents associated with the Humira antibody product); Goode & Chao, *supra* note 74.

76. *See* Goode & Chao, *supra* note 74, at 9. (Figure 2 showing that the US biologic market creates large patent thickets. Where the US asserts 377 patents covering 30 biosimilars, Canada and the United Kingdom only assert 50 and 24, respectively for those same 30 biosimilars); *see also* Wu & Cheng, *supra* note 74 at 109.

77. Karshtedt et al., *supra* note 47; Mark A. Lemley & Jacob Sherkow, *The Antibody Paradox* 132 YALE L.J. (forthcoming 2023). *But cf.* Christopher M. Holman, *Is the Chemical Genus Claim Really "Dead" at the Federal Circuit?: Part I*, 41 BIOTECH. L. REP. 4 (2022).

78. Patent thickets are a set of numerous patents with overlapping rights to the same product. These patent thickets are usually used to delay or deter competition. *See* Wu & Cheng, *supra* note 74, at 130; Feldman, *supra* note 33, at 597.

79. Goode & Chao, *supra* note 74, at 3.

80. *See supra* Figure 12.

81. *See supra* Figure 11.

24 months since 2013.[82] In contrast, there is an increase in pendency from 23 to 27 months for patents in TC 1600 over the past two years.[83] Thus, antibody patents seem to be moving through the patent office much faster than other patents.[84]

The back-and-forth negotiations between the examiner and the applicant for antibody patents are far fewer now than two decades ago. This could be because the claims are much narrower and thus require fewer limitations since applicants have already started with antibody claims that have structural limitations and are narrower in scope. Additionally, these data suggest that both applicants and examiners understand what is required to overcome the written description and enablement standards. In contrast, the earlier patents filed in the early 2000s had broad scope and likely needed more rounds of prosecution to narrow the scope of the claims.[85]

These data also show that antibody patents receive fewer anticipation and obviousness rejections.[86] This is somewhat surprising since usually as a technology develops there is an increase in anticipation and obviousness rejections.[87] It is likely that we see fewer prior art rejections because these very narrow claims are truly novel and non-obvious over the prior art, especially if they contain both structural and functional requirements. Typically, anticipation and obviousness rejections based on prior art are the most difficult and time consuming to overcome.[88] Thus, patent claims that do not face these rejections can move through prosecution faster.

VI. IMPROVING ANTIBODY PATENT PROSECUTION[89]

Antibody technology has radically advanced within the last 30 years. Revolutionary changes in antibody technology have moved antibodies from research tools to diagnosis to treatment of diseases. Current antibody

82. *See Patents Pendency Data September 2022*, USPTO (Nov. 14, 2022), https://www.uspto.gov/dashboard/patents/total-pendency-by-tc.html.

83. *See id.*

84. We note that the 1650 control group also exhibited a decrease in prosecution time from approximately 24 to 18 months. However, this decrease is significantly less than the 16 month decrease from 30 to 14 months exhibited for antibody patents.

85. *See supra* Figure 2 and Section IV.C.

86. *See infra* Figure 5 (showing that the 1650 control group exhibits more than two fold more obviousness rejections) and Figure 4 (showing that 103 rejections comprise less than 10% of the rejections experienced by antibody patents are obviousness rejections, while most other inventions receive seven times more obviousness rejections).

87. *See* Lemley & Sherkow, *supra* note 77, at 4–5.

88. Tu, *supra* note 4.

89. S. Sean Tu is the sole author of Part VI and all opinions in this Section should be solely attributed to him.

technology now allows researchers to create consistent and highly specific antibodies that can not only treat diseases, but also treat disease without many of the key side effects previously common to these drugs. While the uses for antibodies have increased, the numbers of patents filed towards antibodies have commensurately increased. Courts, the USPTO administration, and patent examiners have all responded. Interestingly, however, they have not all moved in the same direction at the same pace.

The USPTO administration, patent examiners, and courts have all taken notice of these scientific advances and have significantly limited the scope of these patents by using the written description and enablement requirements, thus forcing applicants to specifically describe their invention by giving structural elements to the claimed antibody. The Federal Circuit is willing to invalidate patents and reverse billion-dollar judgments based on the written description and enablement requirements.[90] The courts and the USPTO administration, however, have been slow to implement change in response to the changes to antibody technology. In contrast, patent examiners have been actively rejecting patents based on these theories for over a decade.

A. ALLOW SCIENCE TO GUIDE THE LAW

Interestingly, patent examiners applied these enhanced patentability rules for written description and enablement independent of court cases or even in the face of the USPTO written description rules that would otherwise allow broad patent claims. Specifically, patent examiners were forcing applicants to disclose structural features (and not just describing the antigen) before many changes in the caselaw and even after the 2008 USPTO written description guidelines that specifically stated that antibody claims based on antigen structure alone could satisfy the written description requirement.

This phenomenon is most likely because most patent examiners in this technology center are highly educated scientists[91] and although they do apply the legal rules for patentability, they do so through the lens of a scientist. Patent examiners, therefore, are the most in tune with changes in technology.

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90. *See* Centocor Ortho Biotech, Inc. v. Abbott Lab'ys, 636 F.3d 1341 (Fed. Cir. 2011) (where the Federal Circuit overturned a $1.67 billion dollar verdict and invalidated a set of patents based on the lack of written description); Juno Therapeutics Inc. v. Kite Pharma, Inc., 10 F.4th 1330 (Fed. Cir. 2021) (where the Federal Circuit reversed a $1.2 billion dollar verdict and invalidated a patent based on lack of written description); Amgen Inc. v. Sanofi, 987 F.3d 1080 (Fed. Circ. 2021) (where the Federal Circuit affirmed invalidation of a set of patents based on the enablement requirements).

91. Tu et al., *supra* note 68, at 39 (Table 1, showing that over 50% of pharmaceutical patent examiners have a Ph.D.).

Most patent examiners in this technology center, however, do not have a law degree.[92] Patent examiners are also unlikely to be in tune with the most current changes to patent law jurisprudence. Accordingly, it is somewhat unsurprising that patent examiners have been applying a stricter written description and enablement standard than courts for over a decade. What is surprising is that they have largely ignored the USPTO's own 2008 written description guidelines that specifically allow broad antibody claims based solely on antigen structure.[93] In the early days of antibody technology, these broad antigen-defined antibody claims were allowable. After *Lilly*, it looked like antibody patents would be narrowed much like many other biotechnology inventions.[94] However, the courts and the PTO carved out an exception for antibodies, which allowed them broader scope. The courts, however, have now caught up with what patent examiners have been doing for a decade, which is using the written description requirements to narrow antibody claims.

Ultimately, patent examiners help innovators by denying claims that would subsequently be struck down in court. Rejecting these patents spares investors from spending resources based on them. Additionally, rejecting overly broad claims that would be later invalided in court creates more certainty, predictability, and confidence for investors.

By allowing narrower claims, patent law strikes a balance between granting exclusive rights to what the inventor disclosed to the public while protecting against overly broad claims that may hinder innovation in the area. Additionally, unlike broad genus type patents, narrow patent rights incentivize competitors to "design around" products to create additional novel therapeutic antibodies (even if they are directed towards the same antigen).

B. REVERSE DOCTRINE OF EQUIVALENTS

Patent law attempts to promote the progress of the useful arts by giving limited exclusive rights to inventors.[95] This is a delicate balance for the biologics field. On one hand, it may be necessary to provide broader patent protection to motivate firms to take the risk to innovate in this technology, which requires high upfront costs.[96] On the other hand, giving too much

92. *Id.* (Table 1, showing that the only about 10% of patent examiners in TC1600 have a J.D.).

93. USPTO, *supra* note 48, at 45–46 (Example 13, showing that a claim directed towards "[a]n isolated antibody capable of binding to antigen X" can satisfy the written description requirements of 35 U.S.C. § 112).

94. *See generally* Holman, *supra* note 54.

95. U.S. Const. art. 1, § 8.

96. Olivier J. Wouters, Martin McKee & Jeroen Luyten, *Estimated Research and Development Investment Needed to Bring a New Medicine to Market, 2009–2018*, 323 JAMA 844, 848 (2020)

protection can inhibit innovation by preventing important follow-on technology. Some commentators have argued that the pendulum has swung too far, arguing that applicants are now inappropriately being denied genus claims.[97]

One solution to this delicate balance may lie in the rarely used Reverse Doctrine of Equivalents ("reverse DOE"). The reverse DOE allows improvers to capture the value associated with an invention that would literally infringe another's patent. Accordingly, the reverse DOE could offer a solution to reward improvers even though their improvements would literally infringe on a prior patent.[98]

The rarely used reverse DOE is a mechanism by which a court can find that an invention does not actually infringe on a patent even though it literally falls within the scope of the claims.[99] The original example of reverse DOE occurred in 1869 when George Westinghouse invented a train brake that used compressed air from a central reservoir to stop the train. In 1887, George Boyden improved on this break by using compressed air from a central reservoir *and* a local reservoir in each brake cylinder. The Supreme Court found that, the new invention "has so far changed the principle of the device that the claims of the patent, literally construed, have ceased to represent his actual invention."[100] Similarly, the Court in *Graver Tank* stated that:

> [W]here a device is so far changed in principle from a patented article that it performs the same or similar function in a substantially different way, but nevertheless falls within the literal words of the claim, the [reverse] doctrine of equivalents may be used to restrict the claim and defeat the patentee's action for infringement.[101]

(showing that the median capitalized research and development investment to bring a new drug to market was estimated at $985 million).

97. Karshtedt et al., *supra* note 47. *But cf.* Holman, *supra* note 77.

98. *See* Scripps Clinic & Rsch. Found. v. Genetech, Inc., 927 F.2d 1565, 1581 (Fed. Cir 1991) (suggesting that a device may escape liability under the reverse doctrine of equivalents because it is a radical improvement over the patented technology); Atlas Power Co. v. E.I. du Pont de Nemours & Co., 750 F.2d 1569 (Fed. Cir. 1984); *see also* Robert Merges, *Intellectual Property Rights and Bargaining Breakdown: The Case of Blocking Patents*, 62 TENN. L. REV. 75 (1994); Robert P. Merges, *A Brief Note on Blocking Patents and Reverse Equivalents: Biotechnology as an Example,* 73 J. PAT. & TRADEMARK OFF. SOC'Y 878 (1991) [hereinafter Merges, *Biotechnology as an Example*].

99. Ethyl Molded Prods. Co. v. Betts Package, Inc., 9 U.S.P.Q.2d 1001, 1026 (E.D. Ky. 1988) (stating that, "the reverse doctrine of equivalents, although frequently argued by infringers, has never been applied by the Federal Circuit"); *see also* Merges, *Biotechnology as an Example*, *supra* note 98, at 884.

100. Westinghouse v. Boyden Power-Break Co., 170 U.S. 537, 537 (1898).

101. Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605, 608–09 (1950).

As outlined by Merges, reverse DOE may be especially justified when the original patent contributes very little value compared to the improvement.[102] When the improvement greatly increases the value of the original patent, then an inefficient holdup problem may become significant. The social costs of this holdup problem are also significant because the improvement "sits on the shelf for the life of the original patent."[103] Reverse DOE avoids this problem by exempting the improver from infringement liability, thus preventing the patentee from exercising their 'holdup right.[104]

Reverse DOE may be a suitable response to the current situation where courts and the PTO only allow very narrow antibody claims. In calculating the balance between broad and narrow rights, one option could be to default to allowing broad patents and then use reverse DOE to excuse liability for those follow-on inventions that greatly increase the value of the original patent.

This framework creates a system where the USPTO initially grants broad protection for novel inventions based on antibody technology then uses the reverse DOE to exclude follow-on technology that greatly differs from the patented invention. Specifically, courts might use the reverse DOE in a case where a humanized or chimeric antibody recognizes a different epitope or has significantly different functional characteristics from the patented antibody.

One possible application of this solution could be exemplified by the *AbbVie* case.[105] The *AbbVie* court held two AbbVie patents invalid because they lacked adequate written description.[106] These patents were directed to fully human antibodies that bind to and neutralize the activity of human interleukin 12 (IL-12).[107] AbbVie obtained a broad patent directed to fully human anti-IL-12 antibodies.[108] Although the AbbVie patents broadly claimed full human IL-12 antibodies, all the disclosed AbbVie antibodies had: (1) VH3 heavy chains, (2) lambda light chains, (3) at least 90% similarity with Joe-9 in variable regions, and (4) more than 99.5% similarity in variable regions.[109]

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102. *See* Merges, *Biotechnology as an Example*, *supra* note 98, at 885.

103. *Id.* at 886.

104. *Id.*

105. AbbVie Deutschland GMBH & Co, v. Janssen Biotech, Inc., 759 F.3d 1285 (Fed. Cir. 2014).

106. *Id.*

107. *Id.* at 1291.

108. U.S. Patent No. 6,914,128, col. 386 (issued Jul. 5, 2005) (exemplary claim 29 of the 128 patent reads, "A neutralizing isolated human antibody, or antigen-binding portion thereof that binds to human IL-12 and dissociates from human IL-12 with a K_{off} rate constant of $1x10^{-2}s^{-1}$ or less, as determined by surface plasmon resonance.").

109. AbbVie Deutschland GMBH & Co, v. Janssen Biotech, Inc., 759 F.3d 1285, 1291 (Fed. Cir. 2014).

Centocor produced Stelara ("ustekinumab") which was a fully human IL-12 antibody that neutralized the activity of IL-12.[110] Stelara literally infringed the AbbVie patent.[111] However, the Stelara antibody was structurally distinct from Joe and Joe-derived antibodies. Table 2 outlines these key differences.

Table 2

	Stelara	J695	Joe-9
Sequence Similarity	50%	90%	90%
CDR Length	Different	Identical	Identical
Epitope Binding Site	Side Binder	Bottom Binder	Bottom Binder
V_H Family	V_H5	V_H3	V_H3
Light Chain Type	Kappa	Lambda	Lambda

Instead of invalidating the AbbVie patents based on lack of written description, a court could have held the patents valid, but excused Centocor from liability under the reverse DOE. Excusing liability under the reverse DOE in this case is rational because the Stelara antibody improvements changed the principle of the device in a way that no longer represented what AbbVie disclosed in the specification of their patents.

Allowing broad claims while carving out exceptions to those broad claims by using reverse DOE, however, is not a magic bullet. Reverse DOE is an ex post solution applied by courts only after heavy investment in the technology by competitors. Thus, reverse DOE does not address the incentives issue because competitors would not know ex ante if their antibody is "too similar" to the patented antibody.[112] Accordingly, a rational competitor might simply avoid the risk of infringing a broad patent by never investing in research on new antibodies in the first place or delaying research until the relevant patents expire.

Additionally, if reverse DOE is applied too narrowly, then it would act identically to the current written description and enablement framework. Specifically, if reverse DOE is interpreted to only grant a scope exactly commensurate with those working examples disclosed in the specification,

110. *Id.*

111. *Id.* at 1293.

112. With that said, a competitor would also not know ex ante if a 35 U.S.C. § 112(a) invalidity argument would succeed. However, allowing both § 112(a) and reverse DOE arguments to move forward might be the best way to maximize social welfare. Doing so would by incentivize truly novel patents by preventing trivial variations while excusing liability for valuable design arounds.

then it is no better than using the current written description and enablement standards. However, reverse DOE is currently better than the current solution, which is to simply invalidate broader antibody patents that may bring new and innovative drugs to market.

C. FUNCTIONAL CLAIMING AND THE DOCTRINE OF EQUIVALENTS

Lemley and Sherkow have recently suggested the use of functional claiming and the Doctrine of Equivalents (DOE) to save these antibody genus claims.[113] Functional claiming through means-plus-function claiming (§ 112 ¶ 6) allows a patentee to claim those antibodies disclosed in the patent's specification and equivalents thereof.[114] The difficulty, however, lies in determining which antibodies are "equivalent" to those described in the specification. Accordingly, many of the problems associated with the use of reverse DOE are also present with DOE.

Similar to reverse DOE, the means-plus-function claiming in combination with DOE offers a possible intermediate scope. Use of reverse DOE or functional claiming with DOE would allow patent owners to prevent the development trivial changes to competing technologies that bind the same antigen with the same functional result. However, both doctrines would also leave open the ability for competitors to develop their own antibody that works in a different way, binding to a different epitope and creating a different therapeutic outcome.

The advantage of DOE in combination with means-plus-function claiming is that this broader claim would cover any equivalents covered by the means-plus-function language as well as the DOE (same function, way, and result). Additionally, use of DOE in combination with means-plus-function should avoid written description problems because the functional equivalents would be tethered to the functions disclosed in the specification.

One advantage of using reverse DOE over DOE is placement of the burden of proof. With reverse DOE, the alleged infringer is put on notice of the broader patent. The alleged infringer would be aware ex ante that he is infringing the patent. However, the alleged infringer could then argue that their changes to the antibody were significant enough to excuse liability. This would force competitors to base the changes to the antibody on a change in function or a change in epitope.

Using functional claiming with DOE would put the burden of proof on the patentee to show that the alleged infringing antibody is substantially similar

113. Lemley & Sherkow, *supra* note 77.
114. *See In re* Hyatt, 708 F.2d 712, 713–14 (Fed. Cir. 1983).

to the claimed invention. Accordingly, unlike reverse DOE, the burden is placed on the patentee and not the accused infringer. I (S. Sean Tu) believe that the better default rule should be that the alleged tortfeasor bears the burden of showing why his acts are lawful rather than placing the burden on the patentee to show why the alleged infringer's acts are unlawful.

VII. CONCLUSION

Courts, the USPTO administration, and patent examiners have all dealt with antibody patents in slightly different ways. However, it seems that all three arms have now reached a consensus. Each group now uses 112(a) to deny broad claims based only on function and antigen structure. However, narrow claims with antibody structural elements are currently allowed.

This study shows that patent examiners over time have increasingly used § 112(a) rejections to narrow claims. Antibody patents moved from broad functional claims to narrow structurally limited claims. Finally, an increase in the number of words per independent claim and the increased use of continuation practice combined with shorter prosecution durations all suggest that the scope of antibody patents has narrowed over time.

VIII. APPENDIX 1 – ANTIBODY FUNDAMENTALS

A. GENERAL DEFINITIONS

1. Antigen – The target molecule that the antibody binds to.

2. Epitope – The specific region of an antigen that the antibody binds to.

3. Paratope – The region of an antibody that is responsible for binding to the epitope.

4. Complementarity Determining Regions (CDRs) – Six regions on the antibody that collectively come into contact with the antigen. There are three CDR loops per variable domain in antibodies (three on the light chain and three on the heavy chain). CDRs on the light chain are labeled CDR L1, CRD L2, and CDR L3. CDRs on the heavy chain are labeled CDR H1, CRD H2, and CDR H3.

5. Light Chain/Heavy Chain – Antibodies are comprised of two light chains and two heavy chains in a Y-structure shown in Figure 1. Each Y contains two identical copies of a heavy chain and two identical copies of a light chain. The light chain and heavy chains are different in their sequence and length. The top of the Y shape is defined by the CDR sequences which form the paratope, which binds tightly and specifically to an epitope on the antigen.

6. Variable Region – The region defined by the CDRs and surrounding framework regions.

7. Constant Region – The part of an antibody that is common to its particular class. The constant region is involved in triggering the immune response and determines the mechanism by which the antigen is destroyed.

8. Polyclonal Antibody – A diverse population of antibodies targeted to the same antigen.

9. Monoclonal Antibody – A single antibody directed to a target epitope.

10. Bispecific Antibody – An antibody that can bind two targets.

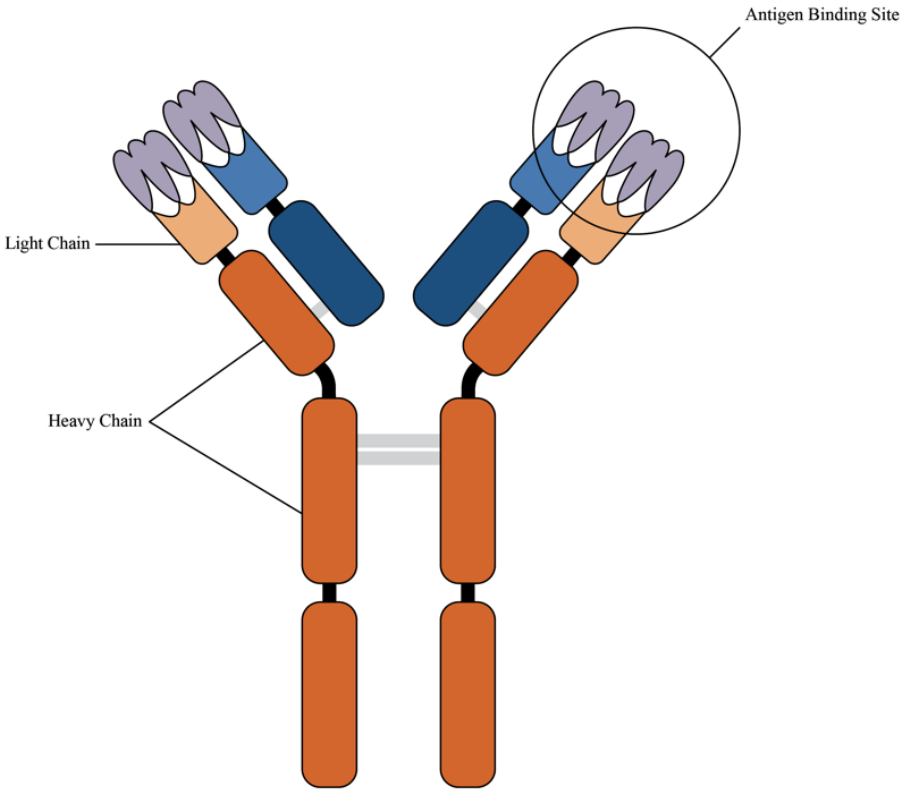
11. Chimeric Antibody – An antibody that has been engineered from more than one different species. Commonly, the variable region is defined by a non-human antibody which is then linked to the constant region of a human antibody. This is done to limit the human immune response to a mouse antibody.

12. Humanized Antibody – A subclass of chimeric antibody where most of the sequences are human in origin.

B. ANTIBODY STRUCTURE, FUNCTION AND METHOD OF PRODUCTION

Antibodies, also known as immunoglobulins, are natural products of the body that are secreted by B-cells as part of an immunological response to neutralize antigens such as bacteria and viruses. Figure 1 shows the structure of an antibody. The antibody structure is a classic Y-shaped molecule composed of two heavy chains (connected by a linker) and two light chains (connected to the heavy chains). Each tip of the "Y" contains a paratope which can bind only one epitope on an antigen. This allows the antibody to bind its antigen with precision. There are two main types of antibodies: polyclonal and monoclonal. Monoclonal antibodies are identical and have the same binding specificity and recognize the same epitope. In contrast, polyclonal antibodies against an antigen are a mixture of molecules that have different binding sites, different binding specificities and typically recognize different epitopes on the antigen.

Figure 1



Polyclonal antibodies (pAbs) are a mixture of heterogenous antibodies which are usually produced by different B-cell lines in the body. Thus, pAbs recognize and bind to many different epitopes of a single antigen. Polyclonal antibodies are usually manufactured by injecting an animal with an antigen. After injection, the animal elicits a primary immune response, and then given a secondary injection (and sometimes a third injection) to boost the immune response. The animal's serum [115] can then be collected and polyclonal antibodies to the antigen are isolated using an immobilized antigen.

There are several benefits associated with pAbs. First, is the relative ease and cost of production of pAbs. pAbs are highly stable and can tolerate pH or buffer changes. Additionally, pAbs bind more than one epitope and can help amplify the signal from a target protein even with low expression levels. Accordingly, pAbs are ideal for immunoprecipitation and chromatin immunoprecipitation. Finally, pAbs are less sensitive to antigen changes such

115. Serum consists of blood where the clotting proteins and red blood cells are removed.

as denaturation, polymorphisms, and different glycosylation patterns. One major downside to pAbs, however, is batch to batch variability because each animal mounts a different immune response to the antigen injection.

Polyclonal antibodies have been used as components of antivenom, antitoxin, and transplant antirejection drugs. Importantly, pAbs are also used to *detect* disease in blood or tissue samples. For example, pAbs have been used to detect viruses, cancers, encephalitis, HIV, and Lyme disease.

Monoclonal antibodies ("mAbs") revolutionized antibody technology. In contrast to pAbs, mAbs are usually not produced in live animals. In 1975, Nobel laureates Köhler and Milstein produced the first mAbs.[116] Monoclonal antibodies are generated using hybridoma technology, which is a product of splenocyte and myeloma cell fusions creating an immortalized B-cell-myeloma hybridoma. The hybridomas grow continuously in culture while producing antibodies. These antibodies are then screened for the desired mAbs. Importantly, monoclonal antibodies exhibit *precise and reproducible binding properties*. Monoclonal antibodies bind one specific epitope on an antigen.

Figure 2A describes the different binding specificities of mAbs compared to pAbs. Polyclonal antibodies have the ability to bind different epitopes (triangles and rectangles) on the same antigen. In contrast, mAbs can bind only one specific epitope (triangles) on an antigen. Figure 2B shows that polyclonal antibodies bind to multiple epitopes on the same antigen, while monoclonal antibodies can bind to only one epitope.

116. Georges Köhler & César Milstein, *Continuous Cultures of Fused Cells Secreting Antibody of Predefined Specificity*, 256 NATURE 495 (1975). Georges Köhler and César Milstein shared the 1984 Nobel prize in medicine for this breakthrough.

Figure 2A

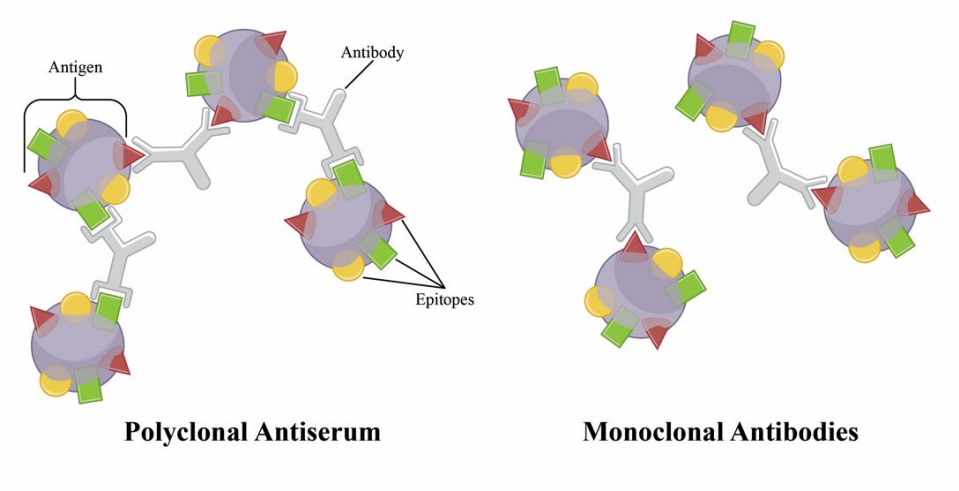
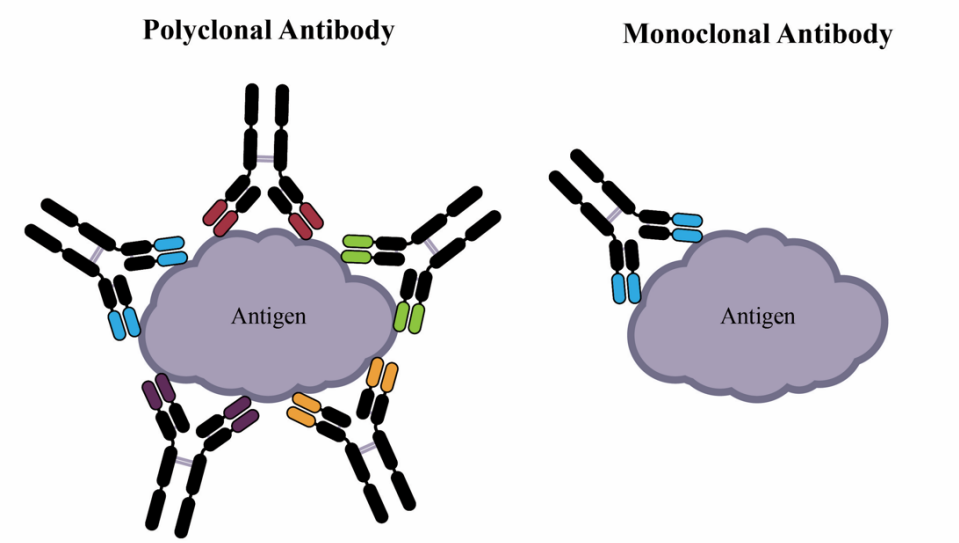


Figure 2B



The benefits of using mAbs cannot be understated. First, mAbs are highly specific and recognize only one epitope of an antigen. Second, once an immortal hybridoma cell line is created, the firm has the ability to produce unlimited quantities of mAb. Because mAbs recognize only one epitope, the results of mAbs are highly consistent with minimal background noise and cross-reactivity. However, the cost and time needed to generate monoclonal antibodies is considerably greater than polyclonal antibodies. Additionally, it

requires highly technical knowledge to create these hybridomas. mAbs are also vulnerable to changes in the epitope and even small changes in antigen conformation may lead to dramatically reduced binding capacity. Due to these consistent results, mAbs are much better suited to be used for therapeutic treatments. Accordingly, mAbs have been used to treat diseases such as rheumatoid arthritis,[117] asthma,[118] psoriasis,[119] and many forms of cancer.[120]

Monoclonal antibodies produced using mouse hybridomas are not ideal for use as human therapeutics. This is because the human body will recognize the mouse mAb as foreign and attempt to remove it from the body. This response is known as the Human Anti-Mouse Antibody (HAMA) response. A HAMA response can cause toxic shock or even death in a patient. Additionally, most mouse mAbs suffer from a short serum half-life in humans.

Accordingly, additional steps are required for mAbs used to treat disease in humans. Monoclonal antibodies must be "humanized" for human clinical use. Figure 3 shows the humanized and chimeric versions compared to mouse antibodies. Chimeric and humanized antibodies reduce the likelihood of a HAMA response by minimizing the non-human portions of administered antibodies. Because most regions of the chimeric and humanized antibodies are human, these antibodies do not elicit as much of an immune response from the patient. Chimeric and humanized antibodies have the additional benefit of activating secondary human immune responses such as antibody dependent cellular cytotoxicity. Furthermore, these chimeric/humanized antibodies have a much longer serum half-life.

Chimeric antibodies are created by substituting the mouse constant region with a human constant region. Thus, the chimeric antibody consists mainly of a human constant region with only the variable regions of the antibody of mouse origin.

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117. Adalimumab ("Humira") from Abbvie is a fully human antibody against tumor necrosis factor (TNF) used to treat rheumatoid arthritis.

118. Dupilumab ("Dupixent") from Regeneron Pharmaceuticals is a fully human antibody against IL4RA used to treat atopic dermatitis and asthma.

119. Infliximab ("Remicade") from Centocor is a chimeric antibody against TNF that is used to treat Chron's disease and plaque psoriasis.

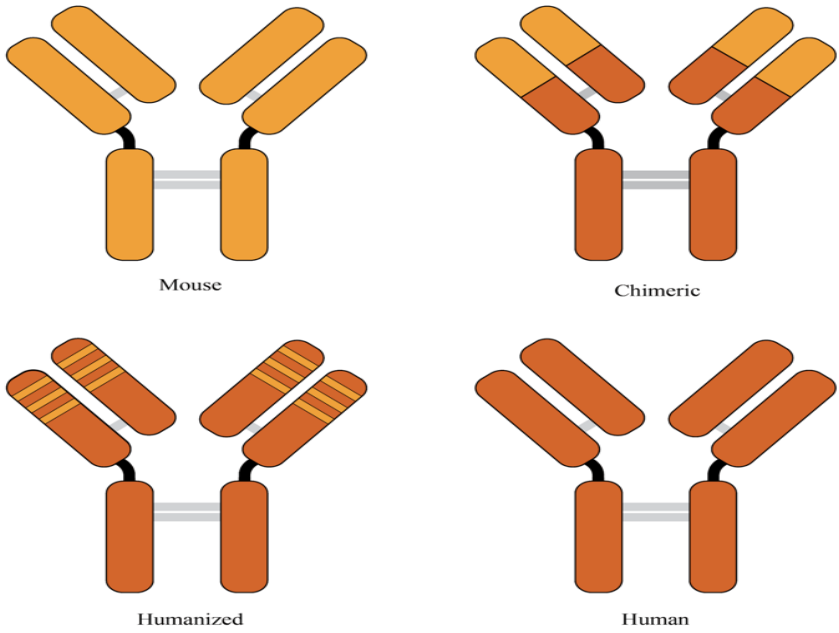
120. Atezolizumab ("Tecentriq") from Genentech is a humanized antibody against PD-L1that is used to treat Urothelial carcinoma and metastatic non-small cell lung cancer. Bevacizumab ("Avastin") from Genentech is a humanized antibody against vEGF used to treat metastatic colorectal cancer. Pembrolizumab ("Keytruda") from Merck is a humanized antibody against PD-1 that is used to treat metastatic melanoma. Rituximab ("Rituxan") from Genentech is a chimeric antibody against CD20 that is used to treat B-cell non-Hodgkin's lymphoma.

Humanized mAbs are created through genetically engineering the mouse B-cell so that the variable regions of the mouse light and heavy chain genes are ligated to human constant regions. This creates an antibody that most of the mouse sequence has been replaced with human Ig sequence. This process results in the production of a mAb that is mostly "human" with only the antigen binding site being of mouse origin. Because the mAb is mostly human in origin, the patient does not recognize the humanized mAb as foreign and does not generate large quantities of anti-mAb antibodies that would hinder the therapeutic mAb's effectiveness.

One of the newest antibody technologies involves the use of a phage display library to artificially construct soluble Fab fragments. These Fab fragments have the ability to penetrate tissues efficiently and do not need to be processed through the endoplasmic reticulum. However, one major drawback to this approach is that a new phage library must be constructed for every antigen, which is a time-consuming process. Additionally, Fabs are not full-length antibodies and lack the C region which is responsible for effector functions. Fabs are produced in bacteria and therefore are not glycosylated, which leads to a much shorter half-life.

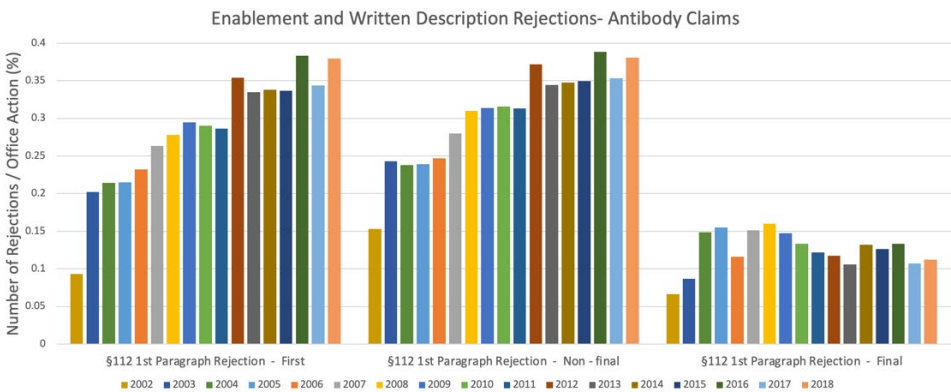
Finally, mAbs are being produced in plants for use in humans. These "plantibodies" are full length antibodies that are glycosylated and thus have a longer half-life in the patient's body. Plantibodies are generated by creating a transgenic plant that expresses human mAbs without harming their own metabolism. Accordingly, large quantities of human mAb can be created cheaply and the seeds produced by these plants can be easily stored.

Figure 3



IX. APPENDIX 2

Appendix 2A



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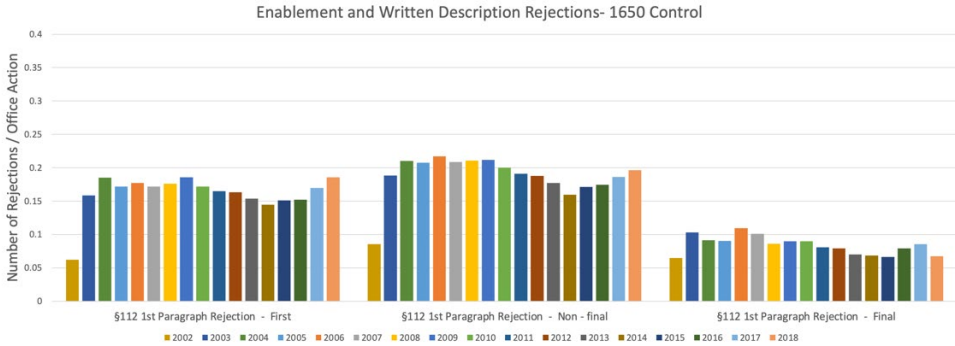

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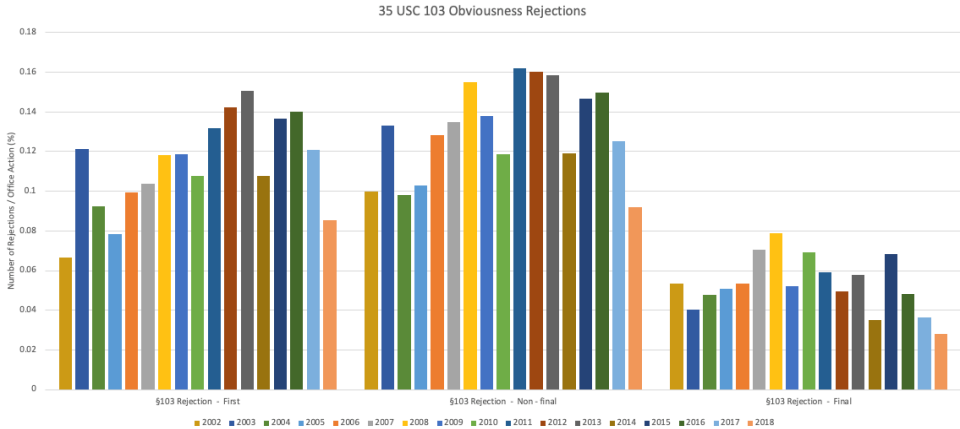

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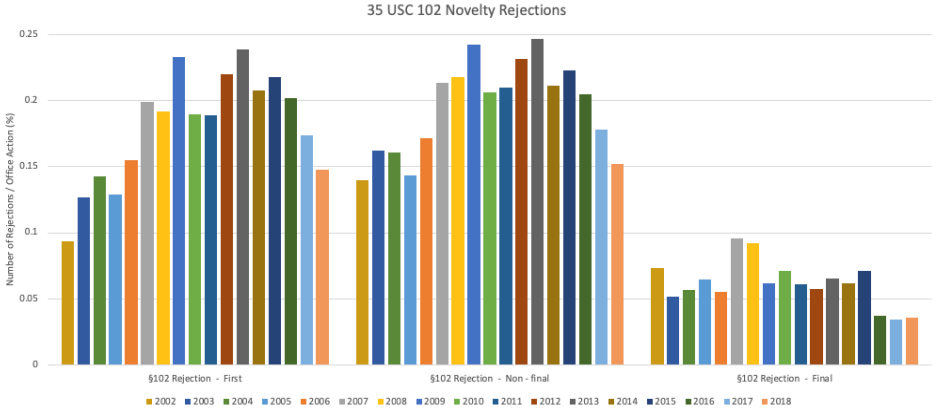

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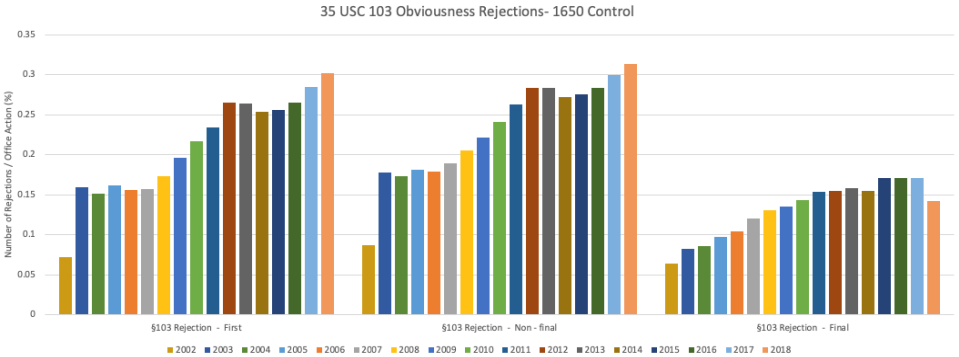

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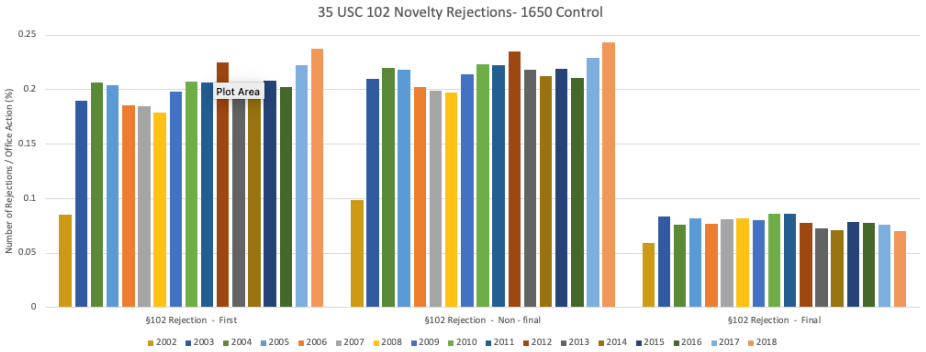

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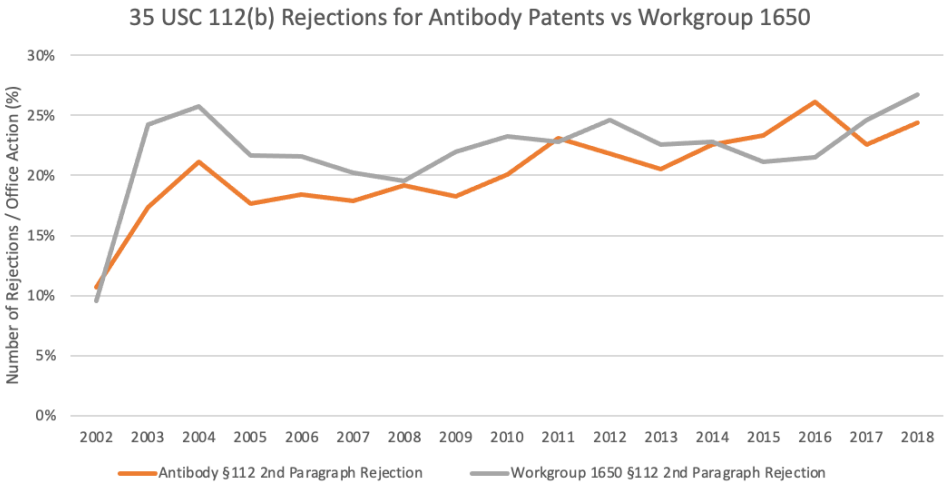
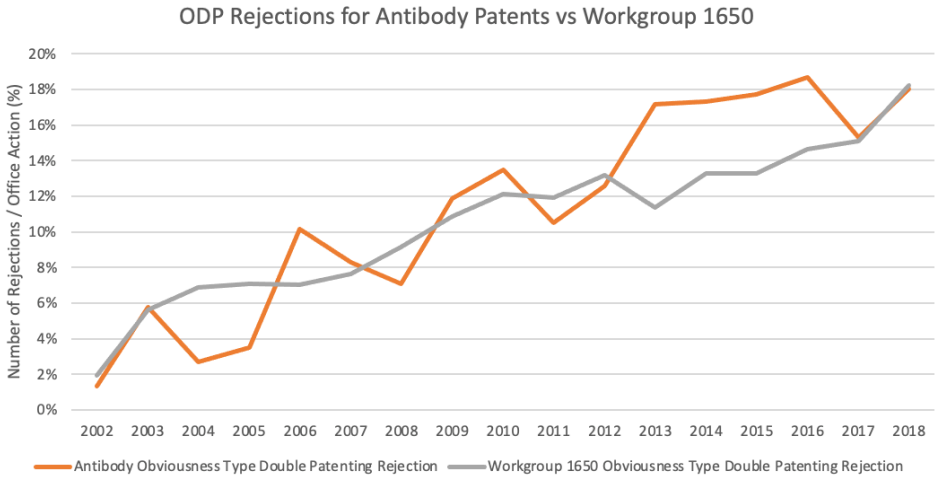


Appendix 6



A POETICS OF TRADEMARK LAW

Alexandra J. Roberts†

ABSTRACT

Poetry and trademarks have a lot in common. Both use language to persuade. Both aspire to say much with little. Both deal in ambiguity, though perhaps only poetry is content to reside in it permanently. While poetry is associated with education and erudition, trademarks are considered a lingua franca, readily understood by all. But reading a trademark remains, in the words of Laura Heymann, "at heart, an interpretive exercise." Poetic devices like rhyme and alliteration play a role in what trademarks mean and how readers of trademarks can locate and articulate that meaning, but their use and interpretation have received little attention in doctrine or scholarship. While applicants and litigants sometimes allege that their marks incorporate poetic devices in support of a claim of distinctiveness, unitariness, or similarity, and factfinders sometimes grant credence to those arguments, both groups tend to use literary terms imprecisely. And that imprecision matters.

This Article explores the poetics of trademarks. It calls upon several overlapping senses of the word "poetics": a study of rhetorical devices; a strategy for interpretation; and a structuring principle undergirding trademark law itself. It defines a number of commonly used poetic devices, offers examples from both poetry and trademarks, and discusses federal court and USPTO decisions that consider their effects on protectability or infringement. Poetic devices have the potential to guide factfinders to deeper insight about word marks. The devices discussed offer ways to articulate what and how a mark means—its denotations, connotations, rhythm, music—specifically and precisely. By treating a trademark as a tiny poem, we make space to honor its complexity.

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† Professor of Law & Media, Northeastern University School of Law & Northeastern University College of Arts, Media & Design; Affiliate Professor, University of New Hampshire Franklin Pierce School of Law. Thanks to Gerard DeStefano and Brianne Kalach for stellar research assistance, the members of the Berkeley Technology Law Journal for expert editing, and Brian Frye, Jessica Gore, Laura Heymann, Mark Lemley, Dustin Marlan, Grace McLaughlin, Nicholson Price, Zahr Said, Matt Saunders, Matthew Sipe, Ed Timberlake, and participants in the 2020 and 2022 Junior Intellectual Property Scholars Association Workshops, the 2021 IP Scholars Conference, the 2021 UNH Law Intellectual Property Roundtable, the 2021 Cardozo Law faculty workshop, the 2022 University of Connecticut Law faculty workshop, the 2022 AALS Annual Meeting IP Section, and the 2023 Boston University School of Law IP Workshop for helpful feedback. Thanks most of all to Helene Mensh Lerner, my high school Latin teacher, who first introduced me to poetic devices.

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I. INTRODUCTION

Poetry and trademarks have a lot in common. Both make abundant use of figures of speech, and both use language to persuade.[1] Both aspire to say much with little. Both deal in ambiguity, though perhaps only poetry is content to reside in it permanently. And readers bring their own experiences and

1. JONATHAN CULLER, LITERARY THEORY: A VERY SHORT INTRODUCTION 69 (1997) ("Poetry is language that makes abundant use of figures of speech and language that aims to be powerfully persuasive.").

associations with words to both poetry and trademarks, making it impossible to articulate a single, objectively "true" reading of either.[2]

While poetry is associated with education and erudition, trademarks are considered a "lingua franca,"[3] known and readily understood by all. Even those readers—or, in the dominant discourse of trademark law, "consumers"[4]—who don't read or speak the relevant language often learn to recognize trademarks through extra-textual features like color, font, and graphics.[5]

Reading a trademark is, in the words of Laura Heymann, "at heart, an interpretive exercise."[6] This Article explores the poetics of trademarks. Poetic devices have the potential to guide readers to deeper insight. The devices explored below offer ways to articulate what and how a mark means—its denotations, connotations, rhythm, music—specifically and precisely. By treating a trademark as a tiny poem,[7] we make space to honor its complexity.[8]

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2. Laura A. Heymann, *The Reasonable Person in Trademark Law*, 52 ST. LOUIS U. L.J. 781, 782 (2008) ("[A]s reader-response theory tells us, there is no reason to prefer any particular interpretation of a text over any other . . . . [T]o ignore the fact that each consumer will engage with a trademark in his or her own way—regardless of what trademark law deems legally cognizable—is to ignore the realities of the market with which trademark law is supposed to engage.").

3. Rochelle Cooper Dreyfuss, *Expressive Genericity: Trademarks As Language in the Pepsi Generation*, 65 NOTRE DAME L. REV. 397, 397–98 (1990).

4. Jeanne C. Fromer & Mark A. Lemley, *The Audience in Intellectual Property Infringement*, 112 MICH. L. REV. 1251, 1257–61 (2014). *See generally* Dustin Marlan, *Rethinking Trademark Law's Consumer Label*, 55 GONZ. L. REV. 421 (2019) and Dustin Marlan, *Is the Word "Consumer" Biasing Trademark Law*, 8 TEX. A&M L. REV. 367 (2021) (summarizing and problematizing the role of the that term in trademark case law, scholarship, and statutory history).

5. Heymann, *supra* note 2, at 791 ("For example, functionally illiterate consumers may not treat a word mark as a word but rather as a pictorial image, recognizable in subsequent encounters only if the mark appears in the same color and font as in the previous encounter.").

6. Heymann, *supra* note 2, at 782.

7. *See* JAMES BOYD WHITE, *The Judicial Opinion and the Poem: Ways of Reading, Ways of Life, in* HERACLES' BOW: ESSAYS ON THE RHETORIC AND POETICS OF THE LAW 107, 122–23 (1985) ("[T]his is not a metaphorical claim: there is an important sense in which the law *is* literature, and can properly be understood and taught and practiced only when that fact is fully recognized.").

8. Mark Yakich recounts that William Carlos Williams "called poems 'little machines,' as he treated them as mechanical, human-engineered, and precise." Mark Yakich, *What Is a Poem?*, THE ATLANTIC (Nov. 25, 2013), https://www.theatlantic.com/entertainment/archive/2013/11/what-is-a-poem/281835/ [https://perma.cc/DM7E-N7H7]; *see also* Laura A. Heymann, *A Name I Call Myself: Creativity and Naming*, 2 UC IRVINE L. REV. 585, 596 (2012), calling the act of naming something an "act[] of microcreativity."

Many find a point of entry into a poem by actively locating rhetorical devices[9] and embedded patterns. Seeking out, naming, and interpreting devices, from alliteration to zeugma, can lead readers to uncover layers of meaning that are not plainly apparent. Such devices also enable readers to articulate their impressions about a poem and support their assertions about different aspects, from the poem's narrative to its speaker to its emotional undercurrent.

Poetic devices likewise play a role in what trademarks mean and how readers of trademarks can locate and articulate that meaning. In marketing, as in poetry, such devices may increase both engagement and pleasure.[10] Trademarks have several audiences, each with its own agenda. USPTO examining attorneys, judges, and jurors may be charged with formally interpreting a trademark and comparing one mark to another to support predictions about consumer perception and likelihood of confusion or dilution. Applicants and litigants take on the task of persuading those factfinders of their preferred interpretation based on evidence and legal precedent. Consumers rely on trademarks as indicators of consistency and aids to commerce. And readers—an audience that can include but is not limited to consumers—engage with trademarks as miniature texts and incorporate them into language and culture.[11]

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9. CULLER, *supra* note 1, at 70 ("A rhetorical figure has generally been defined as an alteration or swerve from 'ordinary' usage."); *see also* EDWARD P.J. CORBETT, CLASSICAL RHETORIC FOR THE MODERN STUDENT 143 (3d. ed. 1990) (defining a rhetorical figure as an "artful deviation").

10. Edward F. McQuarrie & David Glen Mick, *Visual Rhetoric in Advertising: Text-Interpretive, Experimental, and Reader-Response Analyses*, 26 J. CONSUMER RSCH. 37, 39 (1999) ("[R]hetorical figures, in whatever form, can be expected to have two primary effects on consumer response. The first is increased elaboration and the second is a greater degree of pleasure."); "[E]laboration indicates the amount, complexity, or range of cognitive activity occasioned by a stimulus." *Id.* at 39; *see also* Irina D. Manta, *Hedonic Trademarks*, 74 OHIO ST. L.J. 241, 244 (2013) ("Consumers can gain a variety of hedonic enjoyments from using goods with a specific brand, including experiencing emotions tied to the mental associations that arise from . . . the marketing of the brand.").

11. For example, UBER is a trademark for a ride-sharing service. Long before the company launched its services, many readers already had "uber" in their vocabularies as a prefix meaning "very." As Uber the company and UBER the trademark gained market share, the trademark became part of our everyday language. Consumers use the term "uber" to reference the service or the company, while still separately using the prefix as before—"my kid turned 6 yesterday so we got a giant uber-pizza to feed all her friends." Consumers who use the ride-share service regularly began to use the mark not just as an adjective to modify the service, but as a free-standing noun, verb, or some other part of speech: "I'll get you an Uber"; "I Ubered home from the bar"; "this new food delivery service is supposed to be like Uber for food"; "her car had kind of an Uber-y smell to it," and so on. Some even use "uber" as a generic noun or verb for any rideshare, "I'll call you an Uber" where "Uber" means "Lyft."

When factfinders assess the protectability of a trademark, they typically begin by analyzing distinctiveness.[12] An applicant whose mark is categorized as merely descriptive may dispute the categorization by emphasizing aspects of the mark that it claims elevate the mark beyond mere descriptiveness, including the mark's use of poetic devices.[13] USPTO examining attorneys also often assess whether a mark is unitary—"whether it creates a commercial impression separate and apart from any unregistrable components."[14] Here too, applicants may emphasize their use of poetic devices to avoid having to disclaim portions of their marks as generic or descriptive. Meanwhile, when factfinders assess infringement, they focus on the likelihood of confusion between two similar marks, usually relying on a multi-factor test.[15] In every jurisdiction, the two marks' similarity is a key factor.[16] In adjudging similarity, factfinders often consider "sight, sound, and meaning."[17] Similarity also plays a key role in dilution analyses.

12. An inherent distinctiveness analysis requires classifying the mark as generic, descriptive, suggestive, arbitrary, or fanciful for the goods or services with which it's used. 2 J. THOMAS MCCARTHY, MCCARTHY ON TRADEMARKS AND UNFAIR COMPETITION § 11:2 (5th ed. 2022).

13. Elsewhere I have argued that "fact finders often focus unduly on mark selection, fixing on the employment of double entendre, incongruity, rhyme, metaphor, alliteration, or other rhetorical device as evidence that a mark is distinctive." Alexandra J. Roberts, *How to Do Things with Word Marks: A Speech-Act Theory of Distinctiveness*, 65 ALA. L. REV. 1035, 1048 (2014). I continue to maintain that use of rhetorical or poetic devices does not necessarily or automatically elevate a word or phrase from descriptive to inherently distinctive. But I think there is some utility in considering those devices and their effect on consumer perception.

14. Trademark Manual of Examining Procedure (TMEP) § 1213.05 (July 2022 ver.).

15. Likelihood of confusion analyses arise in two contexts. First, factfinders (usually the USPTO) may be tasked with assessing whether an application to register a mark should be refused or an existing registration canceled because it creates a likelihood of confusion with a registered mark under Lanham Act § 2(d). Second, factfinders (usually federal courts) may be tasked with assessing whether a junior user's mark creates a likelihood of confusion with a senior user's mark in an infringement cause of action under Lanham Act § 34 or § 43. These inquiries are very similar but not identical. *See generally* Lorelei D. Ritchie, *What Is 'Likely to be Confusing' About Trademark Law: Reconsidering the Disparity Between Registration and Use*, 70 AM. U. L. REV. 1331 (2021) (discussing the role of evidence of real-world use in likelihood of confusion analyses).

16. *In re* Lonely Hearts Club Ltd., No. 79174419, 2017 WL 6033943, at *1 (T.T.A.B. Nov. 15, 2017) (citing Federated Foods, Inc. v. Fort Howard Paper Co., 544 F.2d 1098, 192 U.S.P.Q. 24, 29 (C.C.P.A. 1976)) ("In any likelihood of confusion analysis, two key considerations are the similarities between the marks and the similarities between the goods."); *see also* Barton Beebe, *An Empirical Study of the Multifactor Tests for Trademark Infringement*, 94 CALIF. L. REV. 1581, 1591, 1610 (2006) (noting all 13 circuits include similarity of the marks among their likelihood of confusion factors and "a finding that the similarity factor favors a likelihood of confusion is necessary but not sufficient to trigger an overall finding of a likelihood of confusion.").

17. AMF Inc. v. Sleekcraft Boats, 599 F.2d 341 (9th Cir. 1979).

When factfinders focus on protectability and likelihood of confusion, they approach trademarks from a perspective that is narrow and outcome driven. Probably they must. Courts, scholars, and expert witnesses have brought to bear a variety of tools to help inform decisions about whether a mark is distinctive and whether a pair of marks is similar. Those tools include dictionary definitions;[18] evidence of popular[19] and competitor usage;[20] linguistics;[21] market research;[22] consumer surveys;[23] consumer[24] or dealer[25] testimony; mark owners' intent;[26] visual and aural comparison;[27] judicial

18. *See, e.g.*, Snyder's Lance, Inc. v. Frito-Lay N. Am., Inc., 542 F. Supp. 3d 371, 383 (W.D.N.C. 2021); Zatarains, Inc. v. Oak Grove Smokehouse, Inc., 698 F.2d 786, 792 (5th Cir. 1983).

19. *See, e.g.*, *Snyder's Lance*, 542 F. Supp. 3d at 400.

20. *See* Alexandra J. Roberts, *Mark Talk*, 39 CARDOZO ARTS & ENT. L.J. 1001, 1010 (2021) ("It makes sense that exclusive rights in language that will be desirable and useful to competitors should only be granted upon an impressive showing that consumer perception has shifted, and that, therefore, if competitors make use of identical or very similar matter, their use may deceive consumers.").

21. *See*, *e.g.*, Quentin Ullrich, *Corpora in the Courts: Using Textual Data to Gauge Genericness and Trademark Validity*, 108 TRADEMARK REP. 991, 1031 (2018); Roger W. Shuy, *Using Linguistics in Trademark Cases*, *in* HANDBOOK ON FORENSIC LINGUISTICS 8 (2011), http://www.rogershuy.com/pdf/TrademarkLinguistics.pdf; McKee Baking Co. v. Interstate Brands Corp., 738 F. Supp. 1272, 1275 (E.D. Mo. 1990); J & J Snack Foods Corp. v. Nestle U.S.A., Inc., 149 F. Supp. 2d 136, 148 (D.N.J. 2001).

22. *See*, *e.g.*, *Snyder's Lance*, 542 F. Supp. 3d at 400; USPTO v. Booking.com B.V., 140 S. Ct. 2298, 2313–15 (2020).

23. *Id.* at 2307 n.6; Snyder's Lance, *supra* note 18, at 397–98; *see generally* Robert Thornburg, *Trademark Surveys: Development of Computer-Based Survey Methods*, 4 J. MARSHALL REV. INTELL. PROP. L. 91 (2005); Jake Linford, *Democratizing Access to Survey Evidence of Distinctiveness*, *in* RESEARCH HANDBOOK ON TRADEMARK LAW REFORM 225 (Graeme B. Dinwoodie & Mark D. Janis eds., 2021); Barton Beebe, Roy Germano, Christopher Jon Sprigman & Joel Steckel, *The Role of Consumer Uncertainty in Trademark Law: An Experimental and Theoretical Investigation* (NYU Law and Economics Research Paper No. 21-13, 2021), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3854730.

24. MCCARTHY, *supra* note 12, § 15:41.

25. MCCARTHY, *supra* note 12, § 15:39.

26. Alexandra J. Roberts, *How to Do Things with Word Marks: A Speech-Act Theory of Distinctiveness*, 65 ALA. L. REV. 1035, 1076–77 (2014) (citing Unleashed Doggie Day Care, LLC v. Petco Animal Supplies Stores, Inc., 828 F. Supp. 2d 384, 391 (D. Mass. 2010)); Devcon Corp. v. Woodhill Chem. Sales Corp., 455 F.2d 830, 832 (1st Cir. 1972); Water Pik, Inc. v. Med-Sys., Inc., 848 F. Supp. 2d 1262, 1277 (D. Colo. 2012); DuoProSS Meditech Corp. v. Inviro Med. Devices, Ltd., 695 F.3d 1247, 1256 (Fed. Cir. 2012); Firefly Digital Inc. v. Google Inc., 817 F. Supp. 2d 846, 862 (W.D. La. 2011).

27. *See, e.g.*, Mead Data Cent., Inc. v. Toyota Motor Sales, U.S.A., Inc., 875 F.2d 1026, 1030 (2d Cir. 1989).

intuition;[28] and personal experience.[29] That toolbox should also include poetics. Applicants and litigants sometimes allege that their marks incorporate devices like rhyme, alliteration, or double entendre in support of a claim of distinctiveness, unitariness, or similarity (or a lack thereof), and factfinders may grant credence to those arguments. But both groups often use those terms imprecisely.

What does it look like when factfinders take poetic devices into account? When the Trademark Trial and Appeal Board (TTAB) held LIGHT 'N LIVELY unitary and distinctive for reduced calorie mayonnaise, it credited the mark's "alliterative lilting cadence."[30] When it found PISSTERINE for a novelty mouthwash created a likelihood of confusion with LISTERINE, it pointed to rhyme as an element of their similarity.[31] The USPTO granted registration of the clipped NILLA for cookies without requiring secondary meaning or disclaimer,[32] whereas "vanilla" surely would have needed both or been deemed unregistrable. And a district court in an infringement case comparing LETTUCE ENTERTAIN YOU and LETTUCE MIX, both for restaurant services, granted a preliminary injunction in part because both parties used "lettuce" to pun on "let us," a pun the court presumed consumers would view as the "salient feature" of both marks.[33]

28. Roberts, *supra* note 26, at 1056("[J]udges have repeatedly acknowledged that intuition plays a large role in evaluating distinctiveness . . .") (citing Lahoti v. VeriCheck, Inc., 586 F.3d 1190, 1197–98 (9th Cir. 2009)); Dranoff-Perlstein Assocs. V. Sklar, 967 F.2d 852, 858 (3d Cir. 1992); Pizzeria Uno Corp. v. Temple, 747 F.2d 1522, 1528 (4th Cir. 1984); Educ. Dev. Corp. v. Econ. Co., 562 F.2d 26, 29 (10th Cir. 1977); Anheuser-Busch, Inc. v. Holt, 92 U.S.P.Q.2d 1101, 2009 WL 3078027, at *5 (T.T.A.B. Sept. 16, 2009) ("[t]he distinction, furthermore, is often made on an intuitive basis rather than as a result of precisely logical analysis susceptible of articulation.").

29. Heymann, *supra* note 2, at 788.

30. *In re* Kraft, Inc., 218 U.S.P.Q. (BNA) 571, 573 (T.T.A.B. 1983).

31. Johnson & Johnson v. Pissterine, No. 91254670, 2022 WL 190986, at *16 (T.T.A.B. Jan. 18, 2022).

32. NILLA, Registration No. 859,776.

33. Lettuce Entertain You Enters., Inc. v. Leila Sophia AR, LLC, 703 F. Supp. 2d 777, 785 (N.D. Ill. 2010); *see also* Westwood One, Inc. v. Natl. Broad. Co., Inc., No. 82-976 (C.D. Cal. Apr. 9, 1982), 1982 WL 52140, at *2, *on reconsideration sub nom.* Westwood One, Inc. v. NBC, Inc., CV 82-976 (C.D. Cal. May 24, 1982), 1982 WL 63789 (holding that marks' use of the same pun contributed to their similarity: "While their literal meanings are opposites, their almost identical puns appear to be a much more important component of their value."); LTTB LLC v. Redbubble, Inc., 840 F. App'x 148, 152 (9th Cir. 2021) (holding plaintiff's uses of its registered trademarks that featured the pun LETTUCE TURNIP THE BEET were functional, not source-identifying).

Poetic devices appear in trademarks not merely as *ars gratia artis*.[34] They're usually intended to contribute to the marks' effectiveness.[35] Some explain the use of rhetorical devices in marketing as violating conventions of language and thought.[36] When a convention is violated, speakers work to make the violation intelligible.[37] As empirical research by marketing scholars McQuarrie and Mick confirms that "artful deviation" has positive effects on attention, recall, and emotional response; the authors conclude that "all rhetorical figures can be expected to confer these advantages to some extent."[38]

A mark that employs rhyme, like OODLES OF NOODLES, may be more memorable to consumers. A mark with assonance, like FROZEN ROSÉ, may be catchier and more enjoyable to say.[39] If true, those features contribute to a mark's—and potentially, in turn, a business'—success and value in real and measurable ways.[40] A mark that consumers find appealing may lead them to choose the goods and services that bear it. A catchy or memorable mark may be primed to acquire secondary meaning quickly and become protectable even if its primary resonance is descriptive. If consumers remember a mark in a

34. Latin for "art for the sake of art."

35. *See* Bruce Vanden Bergh, Keith Adler, & Lauren Oliver, *Linguistic Distinction Among Top Brand Names*, J. ADVERT. RSCH. 39, 40, 42 (Aug/Sept 1987) (tallying the frequency of occurrence of 22 linguistic devices, many among those discussed below, in an annual listing of the top 200 brand names from 1971 to 1985, and finding 71% of the 479 unique trademarks considered employed one or more such device); *see also* Tina M. Lowrey, L. J. Shrum, and Tony M. Dubitsky, *The Relation Between Brand-Name Linguistic Characteristics and Brand-Name Memory*, 32 J. ADVERTISING 7, 9 (2003) (finding links between linguistic variables and brand name memory); David Luna, Marina Carnevale & Dawn Lerman, *Does brand spelling influence memory? The case of auditorily presented brand names*, 23 J. CONSUMER PSYCH. 36 (2013) (testing how spelling-related characteristics of brand names and the context in which they are presented make the brands more or less memorable); Edward F. McQuarrie & David Glen Mick, *Figures of Rhetoric in Advertising Language*, 22 J. CONSUMER RSCH. 424, 424 ("[W]hen persuasion is the overriding goal, the rhetorical perspective suggests that the manner in which a statement is expressed may be more important than its propositional content.").

36. *Id.* at 425 ("Words are generally used to convey one of the lead meanings given in their dictionary entry. However, a metaphor violates that convention, as in this headline for . . . Band-Aids: 'say hello to your child's new bodyguards.'").

37. *Id.* at 426 (citing Dan Sperber & Deidre Wilson, RELEVANCE: COMMUNICATION & COGNITION (1986)).

38. *Id.* at 427.

39. *See generally* Richard R. Klink & Lan Wu, *The role of position, type, and combination of sound symbolism imbeds in brand names*, 25 MARKETING LETTERS 13, 14 (Mar. 2014); Ruth Pogacar, Emily Plant, Laura Felton Rosulek & Michal Kouril, *Sounds good: Phonetic Sound Patterns in Top Brand Names*, 26 MKTG. LETTERS 549 (2015).

40. Researchers have determined that advertisements that employ incongruity and figurative speech attract attention and offer readers additional rewards from processing them. McQuarrie & Mick, *supra* note 35, at 427 (citing Daniel Berlyne, AESTHETICS AND PSYCHOBIOLOGY (1971)).

positive way, it may help distinguish the mark owner's goods and decrease the likelihood of confusion with a prior mark that doesn't make use of poetic devices in the same way. Because trademarks also serve as marketing, those selecting them often pour tremendous resources into maximizing their appeal.[41] Companies that can afford it hire consultants to find and focus group the perfect brand name. Small business owners, entrepreneurs, and lay people have strong intuitions about what marks "work" and don't work,[42] and appealing marks are often those that employ poetic devices.

Before we go further, the use of "poetics" warrants further explication. Poetics in its most specific sense denotes simply a theory of poetry,[43] an "attempt[] to define the nature of poetry, its kinds and forms, its resources of device and structure, the principles that govern it, the functions that distinguish it from other arts, the conditions under which it can exist, and its effects on readers or auditors."[44] So one way to understand poetics is as the study of linguistic techniques and conventions in the written word.[45] This Article endeavors to study linguistic techniques and conventions in trademarks and explore how the legal doctrines that are applied to them account for those devices: hence, a poetics of trademark law.

The second relevant definition, overlapping but distinct, defines poetics in opposition to hermeneutics.[46] In that sense, poetics begins by observing a work's perceived effects and then traces them backward to the conventions that created them. With perceived meaning as "point of departure," the task of poetics "is to account for whatever effects we can attest to."[47] Hermeneutics, conversely, "starts with texts and asks what they mean, seeking

41. *See, e.g.*, Laura Stampler, *Here's How Much Money The World's Biggest Brands Spent Designing Their Logos*, BUSINESS INSIDER (Aug. 14, 2012), https://www.businessinsider.com/heres-how-much-money-the-worlds-biggest-brands-spent-designing-their-logos-2012-8 [https://perma.cc/98SQ-LSMT] (BP spending 211 million dollars to redesign its logo and devise its new tagline, "beyond petroleum.").

42. *See, e.g.*, the anonymous gentleman who insisted to his girlfriend that the company he dreamed up to create a network of pipes that deliver soup into people's homes on demand "MUST be called soup tube, not soup pipe, tube just zings better." Relationships.txt (@Redditships), Twitter (July 8, 2020, 2:22 PM), https://twitter.com/redditships/status/1280975449485651969. While it's entirely possible this story is apocryphal, I include it not for the fact of the matter asserted but for the lay intuition about "soup tubes."

43. *Poetics*, THE PRINCETON ENCYCLOPEDIA OF POETRY & POETICS 930 (1993).

44. *Id.*

45. CULLER, LITERARY THEORY: A VERY SHORT INTRODUCTION 63 (2nd ed. 2011) ("[A] crucial part of poetics is an account of how readers . . . go about interpreting literary works—what are the conventions that enable them to make sense of works as they do.").

46. *Id.* at 62 ("Taking meanings or effects as the point of departure (poetics) is fundamentally different from seeking to discover meaning (hermeneutics).").

47. *Id.* at 62–63.

to discover new and better interpretations."[48] If we believe that a factfinder begins with a trademark and looks to the techniques and devices it employs (along with other clues and cues) to lead them to the best assessment of the mark and application of the law to it, that sounds like hermeneutics. If, on the other hand—as many of the examples that follow seem to indicate—we suspect that a factfinder begins by observing that a mark is inherently distinctive, or confusingly similar to another mark, and then turns to the techniques and devices the mark employs to justify that conclusion, that sounds more like poetics. Hermeneutic models are stereotypically associated with legal interpretation.[49] But legal realism offers a more cynical gloss, with critics characterizing its premise as the theory that judges decide cases according to their own tastes or intuitions and then work backward to locate a legal rule that justifies their conclusion.[50]

It will be apparent throughout the ensuing discussion and examples that: (1) many trademarks incorporate poetic devices; (2) owners and applicants sometimes point to those devices to support a legal argument about the correct interpretation or status of a mark; and (3) factfinders sometimes take into consideration those devices in justifying determinations about marks. The question of whether poetic devices in trademarks enable factfinders to start with texts—here, trademarks—and ask what they mean or whether factfinders use poetic devices to account for those effects they have already identified is a circular one.[51] It cannot be definitively answered by simply reviewing decisions, but it provides an interesting jumping-off point from which to explore the cases.

One more definition of "poetics" is worth mention. Applied to the work of a single author, genre, or category of text, it can mean simply "structuring

48. *Id.* at 62.

49. *Id.* ("[H]ermeneutic models come from the fields of law and religion, where people seek to interpret an authoritative legal or sacred text in order to decide how to act.").

50. *See* Ronald Dworkin, TAKING RIGHTS SERIOUSLY 86 (1977); *see also* Timothy J. Capurso, *How Judges Judge: Theories on Judicial Decision Making*, 29.1 U. BALT. L.F. 5, 5 (1998) ("Realists stipulate that judges determine the outcome of a lawsuit before deciding whether the conclusion is, in fact, based on an established legal principle.") (citation omitted); Adam Liptak, *An Exit Interview With Richard Posner, Judicial Provocateur*, N.Y. TIMES (Sept. 11, 2017) ("I pay very little attention to legal rules, statutes, constitutional provisions . . . . A case is just a dispute. The first thing you do is ask yourself—forget about the law—what is a sensible resolution of this dispute?").

51. *See* Felix S. Cohen, *Transcendental Nonsense and the Functional Approach*, 35 COLUM. L. REV. 809, 815 (1935). ("The circularity of legal reasoning in the whole field of unfair competition").

principles."[52] To the extent that trademark law is law that applies to words and phrases used as symbols,[53] and a primary goal of their creators is to lead consumers to remember them and associate them with a specific source, the rhetorical devices that render many marks memorable can be seen as undergirding and lending order to the entire field of trademark law. The study of poetic devices in trademarks and trademark doctrines, then, may be just one more arrow in a factfinder's quiver, or it may be more—it may be read to propose a structuring principle for the doctrines discussed here.

The remainder of this Article proceeds as follows. Part II briefly summarizes the three doctrines in which poetic devices in trademarks are most frequently considered:[54] distinctiveness, unitariness, and similarity. Part III defines several common poetic devices, offers examples of those devices in poetry and trademarks, and discusses federal court and USPTO decisions that consider them. Part IV concludes.

II. CONTEXTS

A. DISTINCTIVENESS

Trademark law protects distinctive matter used to indicate source in connection with specific goods and services. A word mark may be inherently distinctive and afforded protection from its first use in commerce, or it may be merely descriptive and only merit protection once it acquires distinctiveness based on consumers' exposure to it.

In assessing inherent distinctiveness, the USPTO and courts typically place word marks into one of five categories. A fanciful mark is one that is created for the purpose of serving as a trademark, like SWIFFER for mops or HAAGEN DASZ for ice cream. An arbitrary mark is an existing term used in connection with goods and services to which it bears no logical connection, like PENGUIN for book publishing services or STRAWBERRY for a clothing store. A suggestive mark subtly suggests some attribute of the goods or services, like GREYHOUND for bus services or OCEAN SPRAY for cranberry juice. Fanciful, arbitrary, and suggestive marks are all treated as inherently distinctive—trademark law presumes that consumers will recognize

52. THE PRINCETON ENCYCLOPEDIA OF POETRY & POETICS, *supra* note 43, at 929 ("Applied to the works of authors . . . [poetics] means something like 'implicit principles'").

53. Or at least, the law of word marks, which this paper takes as its object of study.

54. Of course, those are not the only contexts in which poetic devices in trademarks are relevant. *See, e.g.*, *In re* Dillard Dep't Stores Inc., 33 U.S.P.Q.2d 1058, 1058 (Com'r Pat. & Trademarks 1994) (considering the role of alliteration in declining to amend the registration of COPPER KEY CLOTHING COMPANY for clothing to simply COPPER KEY).

them as trademarks immediately and grants them protection upon use without any further showing of goodwill.

Descriptive marks, meanwhile, are less subtle than suggestive marks. A descriptive mark directly provides information about some aspect of the goods or services, whether it be taste, ingredient, size, use, appearance, smell, geographic origin, owner, or target audience. A mark in that category is deemed "merely descriptive" and does not receive protection unless its owner can demonstrate that it has acquired distinctiveness, i.e., that it has come to serve as a trademark to members of the public based on use.[55] Finally, a generic term or phrase is one that indicates a category of goods or services, like SHOE WAREHOUSE for a warehouse-style shoe store or HOT CHOCOLATE for cocoa mix. Generic terms or phrases are incapable of trademark protection, even if they manage to acquire secondary meaning.[56]

Marks in every distinctiveness category may incorporate, intentionally or unintentionally, poetic devices. Poetic devices in the distinctiveness context typically go unremarked upon unless factfinders, applicants, or litigants are tussling over whether a mark is rightfully characterized as descriptive, distinctive,[57] or generic. When an USPTO examining attorney issues a preliminary refusal to register a mark based on its mere descriptiveness, an applicant often fights back by emphasizing even the most minimally creative aspect of their mark, drawing attention to any flourish that arguably renders it more than descriptive.[58] Many jurisdictions rely heavily on the "imagination test," under which a trademark is suggestive if it requires thought, imagination, or perception to glean the relationship between the mark and a characteristic

55. Courts consider several factors as capable of evidencing acquired distinctiveness, which is also known as secondary meaning. Those include prior registrations; five years of exclusive use; or other factors such as length of use, number of sales, profits, third-party publicity, exclusivity, marketing expenditures, and extent of marketing efforts. *See* Roberts, *supra* note 20, at 1004; TMEP § 1202, at 27–28.

56. *See* Kellogg Co. v. Nat'l Biscuit Co., 305 U.S. 111, 116 (1938); Blinded Veterans Ass'n v. Blinded Am. Veterans Found., 872 F.2d 1035, 1043 (D.C. Cir. 1989). *But see* USPTO v. Booking.com B.V., 140 S. Ct. 2298, 2306 (2020) ("whether a term is generic depends on its meaning to consumers").

57. Roberts, *supra* note 26, at 1038 ("the incorporation of a rhetorical device, such as incongruity, musicality, or double entendre, is often treated as a proxy for distinctiveness.").

58. *See, e.g.*, *In re* Midwestern Pet Foods, Inc., No. 78876346, 2009 WL 273246, at *2 (T.T.A.B. Jan. 30, 2009) (arguing unsuccessfully that CHED 'R' WEDGES for pet food and treats is inherently distinctive because it uses pun, incongruity, an "alliterative, lilting cadence," and a "growling" onomatopoeia); *In re* Erik M. Pelton & Assocs., Pllc, No. 85817818, 2015 WL 2412168, at *2 (T.T.A.B. Apr. 29, 2015) (arguing unsuccessfully that TUESDAY TRADEMARK TIP "is unitary and hence not merely descriptive because it 'employs a unique alliterative and trochaic sound pattern that creates a distinctive commercial impression beyond that of its individual elements.'").

or quality of the goods;[59] if that connection is too obvious to require any imagination, the mark is merely descriptive. I have elsewhere described as a "creativity fallacy" the position implicitly taken by mark owners and sometimes courts that the more effort and inventiveness that went into choosing a mark, the more distinctive it is,[60] and I am skeptical of arguments that the presence of a rhetorical device automatically elevates a mark from descriptive to distinctive. But some applicants find those arguments serve them well in persuading factfinders their marks are worthy of protection.

Factfinders grapple with the issue of inherent distinctiveness most often at the registration stage. In that context, USPTO examining attorneys make distinctiveness and other registrability determinations; applicants can challenge adverse decisions to the TTAB and, after that, to federal court.[61] And examining attorneys' decisions about particular trademarks do not bind peer examiners.[62] A mark might be deemed merely descriptive for a set of goods by one examining attorney and inherently distinctive for the same or similar goods by another.[63] Examiners are bound to apply the same rules, such as "a mark that directly describes some feature of the product with which it's used is merely descriptive," but each combination of mark and product presents a slightly different set of facts.[64] Context and meaning also change over time.

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59. *See* Dustin Marlan, *Visual Metaphor and Trademark Distinctiveness*, 93 WASH. L. REV. 767, 767 (2018) (discussing the imagination test and arguing that its "visual metaphor provides a figurative, cognition-based vehicle by which to extend trademark law's imagination test of inherent distinctiveness from words to images.").

60. Roberts, *supra* note 26, at 1065–67.

61. TTAB decisions are most often appealed to the Court of Appeals for the Federal Circuit but appeals to other district courts are also permitted.

62. TMEP § 702.03(a)(iii) ("the USPTO is not bound by the decisions of the examining attorneys who examined the applications for the applicant's previously registered marks, based on different records."); *In re* Beck, 114 U.S.P.Q.2d 1048, 2015 WL 1458229, at *7 (T.T.A.B. 2015) (citing *In re* Nett Designs, Inc., 57 U.S.P.Q. 1564, 1566 (Fed. Cir. 2001)); U.S. Trademark Application Serial No. 87,331,440, Office Action ("Applicant relies heavily on the examination history of the cited mark but trademark examining attorneys are not bound by the actions of past examining attorneys in prior registrations, even if the registrations have some characteristics similar to the application at issue; each case is decided on its own merits."). Unlike decisions by examining attorneys, TTAB decisions may have precedential effect. *See* B&B Hardware, Inc. v. Hargis Indus., Inc., 575 U.S. 138, 160 (2015) (holding that federal courts are precluded from overturning a likelihood of confusion determination made by the TTAB if the other elements of issue preclusion are met and the uses adjudicated by the TTAB are materially the same).

63. *See In re* Scholastic Testing Serv., Inc., 196 U.S.P.Q. (BNA) 517, 519 (T.T.A.B. 1977) (holding that an applied-for mark that is merely descriptive does not become registrable just because other similar marks were successfully registered); TMEP § 1209.03(a).

64. Occasionally, the facts are not different at all. For example, one examining attorney deemed HEEB disparaging, while another allowed registration of the same mark by the same

CLOUT, for example, is a registered trademark for clothing[65] because its archaic English meaning—"clothing"—is lost to time. As the Trademark Manual of Examining Procedure (TMEP) counsels, "Trademark rights are not static, and eligibility for registration must be determined on the basis of the facts and evidence of record that exist at the time registration is sought."[66]

Distinctiveness can also be part of a threshold validity analysis in infringement or dilution litigation, especially when a lawsuit is based on common law rights. And distinctiveness, under the name of conceptual strength or inherent strength, is part of the strength equation that factors into every jurisdiction's likelihood of confusion analysis.[67] Distinctiveness disputes are compelling because they call for closer scrutiny of marks than we are usually treated to. Factfinders delve more deeply, holding the mark up to the light, pulling the pieces apart and examining them to get at some truth about the mark's viability.

B. UNITARINESS

During the registration process, an applicant may be asked to disclaim any unregistrable components of an otherwise registrable mark.[68] For example, someone who uses and applies to register the trademark UNICORN DRY CLEANING for dry cleaning services would be required to disclaim "dry cleaning," because that phrase is generic for the services specified and therefore ineligible for protection. With the disclaimer, the owner disclaims the unregistrable portion of the mark standing alone, but still asserts rights in the composite mark—not just UNICORN, but UNICORN DRY CLEANING—as a whole.[69] If the mark is determined to be unitary, though, disclaimer is not required. A mark is deemed unitary if "the elements of a mark are so integrated or merged together that they cannot be regarded as

applicant for different goods or services. In those examples, the specific services do not matter, because the (now-defunct) bar on disparaging marks focused only on the mark and not the relationship between the mark and the goods or services. *Compare* Heeb Media's Registration No. 2,858,011 (HEEB for publication of magazines) (No Office Actions issued), *with* U.S. Trademark Application Serial No. 78,558,043 (HEEB for apparel and entertainment services) (Mar. 23, 2007 Office Action refused registration based on bar on registration of disparaging marks), and U.S. Trademark Application Serial No. 78,949,735 (HEEB for news and website services) (Jan. 16, 2007 Office Action refused registration based on bar on registration of immoral or scandalous marks).

65. CLOUT, Registration No. 2,298,718.

66. TMEP § 1216.01.

67. Acquired distinctiveness (or "commercial strength") is the other component of the strength factor in most jurisdictions.

68. 15 U.S.C. § 1056.

69. TMEP § 1213 (quoting Sprague Electric Co. v. Erie Resistor Corp., 101 U.S.P.Q. (BNA) 486, 486–87 (Comm'r Pats. 1954)).

separable."[70] If the applicant instead chose DRYCLEANICORN, for example, it likely wouldn't need to disclaim "dry clean" because the generic phrase is inextricably embedded into the single-word mark. Disclaimers can affect the breadth of rights and therefore enforcement—a three-word mark registered without disclaimers provides more robust rights than a registration for the same mark in which two of the words are disclaimed, at least in theory.

The TMEP specifies a number of types of marks that are or are likely to be unitary and for which disclaimer is therefore not required; some map onto poetic and literary devices neatly and others, less so. Categories include telescoped words, like VITAMINSURANCE or TRAVELOCITY;[71] compound terms formed by joining words together, like PULSAIR;[72] and distinctive slogans, like (according to the TMEP) QUALITY THROUGH CRAFTSMANSHIP.[73] Using verbs can also transform a phrase into a unitary mark: the USPTO would require disclaimer of the word "boats" in the mark FUN BOATS in connection with the sale of boats, but would not require disclaimer of "boats" in the mark BOATS ARE FUN for the same goods.[74] Likewise, prepositional phrases often render a mark unitary, as in TALES OF THE COCKTAIL for conducting seminars in mixology or MANGOES FOR THE EARTH for fresh mangoes.[75]

Simply adding punctuation is another way to make a mark unitary: the TMEP suggests an applicant would need to disclaim the word "nails" in CREATIVE NAILS for nail salon services, but wouldn't need to disclaim it if the mark ended in a question mark, as in CREATIVE NAILS?. Incongruity[76]

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70. TMEP § 1213.05.

71. Telescoped terms join two words together into a portmanteau without sacrificing any component letters of either. For example, combining "vitamin" plus "insurance" to make "vitaminsurance" enables both words to maintain their integrity by sharing the middle letters "i-n" but merges them inextricably, as compared to portmanteaux like "cronut," which drops letters from both "croissant" and donut," or "softchews," which eliminates the space between "soft" and "chews" without changing them. *See* Novartis Consumer Health, Inc. v. McNeil-PPC, Inc., 53 U.S.P.Q.2d (BNA) 1406 (D.N.J. 1999) (holding "softchews" generic for a soft and chewable medication tablet); S.S. White Dental Mfg. Co. v. MacDonald, 285 F. 1005, 1005 (D.C. Cir. 1923) (calling WHITEETH for toothpaste a telescoped mark).

72. Compound terms drop letters from or alter the spelling of their component terms.

73. TMEP § 1213.05(b)(i).

74. *Id.* § 1213.05(b)(ii)(A).

75. *Id.* § 1213.05(b)(ii)(B); *see also* ANNE GILSON LALONDE & JEROME GILSON, GILSON ON TRADEMARKS app. 9-389 (2012).

76. *Id.* § 1213.05(d) ("If two or more terms are combined in a mark to create an incongruity (e.g., URBAN SAFARI, MR. MICROWAVE, and DR. GRAMMAR), the mark is unitary and no disclaimer of nondistinctive individual elements is necessary."); *see also* Roberts, *supra* note 26, at 1064 ("A conclusion that a mark is incongruous may result from the unusual combination of two or more words together, in the form of 'internally incongruous'

and so-called double entendre[77] also render a mark unitary. Compound words joined with punctuation, like RIB*TYPE or RIB/TYPE,[78] and unitary phrases with normal spacing[79] may or may not require disclaimer of unregistrable components. Sound patterns and use of possessives can also factor into evaluation of unitariness.[80] Generally, courts and the USPTO require that a unitary mark has a distinct meaning of its own independent of the meaning of its constituent elements.[81]

All things being equal, owners prefer a registration without any disclaimers to one that makes disclaimer of a term part of the record; they view it as stronger and broader. Unsurprisingly, then, applicants resisting an instruction to disclaim components of their marks often point to rhetorical devices in those marks to bolster their assertions of unitariness.[82]

C. SIMILARITY

The most common form of federal trademark litigation is infringement. While every jurisdiction has devised its own multifactor test to determine the likelihood of confusion between two marks, each of those tests considers the similarity between the marks as a key predictor of consumer confusion.[83] The more similar the marks in sight, sound, and meaning, the more likely members

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marks like REBEL DEBUTANTE for clothing or CORPORATE FUEL for business consulting services. Alternatively, it may result from the use of a term or phrase that is unexpected given the goods in question, 'contextually incongruous' marks like CRAZY GOOD for toaster pastries or SNO-RAKE for a tool for removing snow. Fact finders have identified incongruity based merely on the use of descriptive terms in an unexpected order; the Second Circuit held SEASON-ALL inherently distinctive for aluminum storm windows despite acknowledging that ALL-SEASON would be merely descriptive." (citations omitted)).

77. Discussed *infra* Section III(c)(iv) as paronomasia.

78. TMEP § 1213.05(a)(ii).

79. *Id.* § 1213.05(b).

80. *Id.* § 1213.05(e), (b)(ii)(D).

81. *In re DDMB, Inc.*, 681 F. App'x 919, 923 (Fed. Cir. 2017) (citation omitted).

82. *See* Application of Colonial Stores, Inc., 394 F.2d 549, 552 (C.C.P.A. 1968) (holding that the mark SUGAR 'N SPICE for bakery products is unitary thanks in part to its allusion to the famous nursery rhyme about what little girls are made of); *In re Kraft, Inc.*, 218 U.S.P.Q. (BNA) 571, 573 (T.T.A.B. 1983) (holding that LIGHT 'N LIVELY was a unitary mark for mayonnaise and dairy products based on "an alliterative lilting cadence"); *see also In re* Summit Cos. Inc., No. 87219974, 2018 WL 3105237, at *2 (T.T.A.B. June 8, 2018) (arguing unsuccessfully that ELEVATED ENTERTAINMENT is a unitary mark for bowling alleys due to its double meaning, cadence, and assonance).

83. Some of the most common likelihood of confusion factors across jurisdictions include: strength of the plaintiff's mark; degree of similarity between the two marks; consumers' degree of care or sophistication; overlap in channels of sale and/or advertising; proximity of goods or services; evidence of actual confusion. DINWOODIE & JANIS, TRADEMARKS & UNFAIR COMPETITION: LAW & POLICY 521–23 fig. 7-1 (4th ed. 2014).

of the public could be led to presume some association between them. While infringement cases in federal court receive the most publicity, the TTAB also adjudicates conflicts involving likelihood of confusion. And trademark examining attorneys regularly assess the similarity between registered and applied-for marks in determining whether registration is barred under § 2(d). Similarity may also be assessed as part of a trademark dilution analysis and sometimes becomes relevant in determining whether a defendant's allegedly infringing or diluting use qualifies as a fair use.

Poetic devices may be relevant to each of the three aspects of similarity—sight, sound, and meaning. "Sight" typically refers to what a word mark looks like, including spelling, stylized font, logo, and color;[84] "sound" to the way the mark sounds when heard, sung, or spoken; and "meaning," to denotations and connotations. Poetic devices play a more complicated role in likelihood of confusion analyses than they do in distinctiveness or unitariness assessments. Applicants or litigants emphasizing poetic devices in the latter contexts only argue in one direction: that the use of the device makes the mark *more* protectable and *more* likely to be perceived as an integrated mark.[85] The role of devices in similarity assessments is more haphazard.[86] Litigants or parties in *inter partes* proceedings may argue that the senior or junior user's use of poetic devices makes the marks less similar and therefore less likely to create confusion. Alternatively, the senior user may argue that use of the same device—where both marks alliterate with the same letter or allude to the same historical figure,[87] for example—increases their similarity and in turn increases

84. This Article focuses on word marks, but trademark protection is also available for logos, product packaging, and two- and three-dimensional designs, as well as motion, sound, and scent marks.

85. *See* Jonathan Masur, *Patent Inflation*, 121 YALE L.J. 470, 472–75 (2011) (arguing that the patent prosecution process creates an asymmetric incentive for the USPTO to grant rather than refuse applications to minimize appeals and reversals).

86. Of course, poetic devices in marks may be relevant to other likelihood of confusion factors as well, especially the strength of plaintiff's mark, which has two components: inherent distinctiveness and commercial strength. This Section focuses on the similarity factor because distinctiveness is discussed elsewhere in the Article.

87. For example, a court considering whether there was a likelihood of confusion between FIRST FRANKLIN and FRANKLIN FIRST for baking-related services noted the shared allusion to Benjamin Franklin, a common reference point within the industry. First Franklin Fin. Corp. v. Franklin First Fin., Ltd., 356 F. Supp. 2d 1048, 1054 (N.D. Cal. 2005) ("Considering how many other banks and financial companies have chosen trade names with allusions to Benjamin Franklin, defendant's selection of Franklin First Financial Ltd. might have been perfectly innocent."). Another court assessing the likelihood of confusion between plaintiff's GIDEON mark for Christian ministries and bible distribution and defendant's GIDEON 300 MINISTRIES mark for similar charitable services noted the allusion to the biblical figure by both parties. Gideons Int'l, Inc. v. Gideon 300 Ministries, Inc., 94 F. Supp.

the likelihood of confusion. Lastly, the senior user may point to poetic devices to highlight marks' similarity to each other, as when the two marks rhyme or alliterate not internally but with one another.[88]

III. DEVICES

This Section identifies and defines a number of poetic devices and provides examples of poems and trademarks that employ them. It also discusses registrability decisions and federal and TTAB cases involving those devices where available.

Devices are loosely organized into three groups, corresponding to courts' considerations in assessing the similarity of allegedly confusing marks: (1) sight, (2) sound, and (3) meaning. Of course, most of the devices cut across categories, affecting how consumers perceive a mark visually and aurally as well as what it means to them and how they interpret it.

A. SIGHT

1. Aphaeresis, Apocope, & Elision

The first three devices in this Section are forms of clipping: shortening a word or phrase by dropping a syllable or portion of a word from its beginning, end, or middle.[89]

2d 566, 578, 580 (E.D. Pa. 1999) (finding plaintiff's mark suggestive and enjoining defendant's use).

88. *See* EBSCO Indus., Inc. v. LMN Enterprises, Inc., 89 F. Supp. 2d 1248, 1253 (N.D. Ala. 2000); Londontown Mfg. Co. v. Cable Raincoat Co., 371 F. Supp. 1114, 1117 (S.D.N.Y. 1974); Tisket-A-Tasket Grp. Inc. v. H.S. Craft Mfg. Co., No. F, 1999 WL 1327617, at *1–2 (S.D. Ind. Oct. 12, 1999); W.L. Gore & Assocs. v. Johnson & Johnson, 882 F. Supp. 1454, 1458 (D. Del. 1995), *aff'd sub nom.* W.L. Gore & Assocs., Inc. v. Johnson & Johnson, Inc., 77 F.3d 465 (3d Cir. 1996); Knowles-Carter v. Feyonce, Inc., 347 F. Supp. 3d 217, 226 (S.D.N.Y. 2018). This phenomenon is particularly common in dilution cases. *See, e.g.*, VIP Prod. LLC v. Jack Daniel's Properties, Inc., 953 F.3d 1170, 1176 (9th Cir. 2020); Louis Vuitton Malletier S.A. v. Haute Diggity Dog, LLC, 507 F.3d 252, 260 (4th Cir. 2007).

89. Some experts have also used "clip" to refer to dropping a word from a trademark, as when consumers refer to "Discount Tires" as simply "Discount" (e.g., "[I] . . . did a little research, then called the boys at Discount, told them what I needed"). Expert Report of Ronald R. Butters, Ph.D. at 38, Reinalt-Thomas Corp. v. Mavis Tire Supply LLC, No. 1:18-cv-05877, 2019 WL 4096819, at *53 (N.D. Ga. Mar. 4, 2019); *see also* Expert Report of Ronald R. Butters, Ph.D., TY Inc., v. Softbelly's Inc., No. 1:00-cv-05230, 2006 WL 1651347, at *7 (N.D. Ill. Mar. 4, 2019) ("[Beanie has a] well recognized meaning, as a shortening or CLIPPED FORM of the trademark *Beanie Babies*, which refers (as does *Beanie*) to the plush, bean- or pellet-filled dolls and toys marketed by Ty Inc."); Deposition of Alan S. Kaye, V&S Vin & Sprit Aktiebolag v. Cracovia Brands, Inc., at 21, No. 01 C 9923, 2003 WL 24277225, at *21–25 (N.D. Ill. Sept. 3, 2003) (opining on which syllables of a trademark consumers would be most likely to drop or clip based on linguistic principles of clipping).

For an example, we can look to poet Ntozake Shange:

> you hummed to me while I was
> reachin for the/ ceilin/ where our
> folks was carryin on before Michelangelo
> or Lionel Richie/ some where round there
> where you brush up gainst baobabs/ well
> (you know where my beauty marks are/ all
> over
> HARLEM)[90]

With **APHAERESIS** [aff-a-REE-sis], a sound or syllable is dropped at the beginning of the word. Aphaeresis is common among trademarks:[91] NILLA, for example, simply clips the first syllable from the generic "vanilla." NETFLIX is a product of dropping the first two syllables from "internet" and combining it with an alternative spelling of "flicks." In other marks, a portmanteau is formed by dropping syllables from the word that comes second in the mark, as with OXYTROL (from oxygen plus [con]trol), MOTOROLA (from motor and [victr]ola), MANUGISTICS (from manufacturing and [lo]gistics), and ACCENTURE (from "accent [on the fu]ture]"). INSTAGRAM, LOBSTER GRAM, and copious other marks that end in 'gram omit the first two syllables from "telegram." Likewise, a range of marks for alcoholic beverages end in the last two syllables of margarita, such as WINE-A-RITA, VIVA LA 'RITA, and PIÑA RITA.

Similarly, with **APOCOPE** [a-POK-a-pee], a sound or syllable is dropped at the end of a word. A number of fanciful or suggestive marks are created this way, such as CHOCO TACO (choco[late] taco); BONVOY (from the French bon voy[age]); and MICROSOFT (from micro[-computer] soft[ware]).[92] Some marks clip syllables from three words, producing marks that are less immediately recognizable as clippings, like NABISCO (na[tional] bis[cuit] co[mpany]) or BOLOCO (Bo[ston] lo[cal] co[mpany]). The mark THERAFLU combines the first two syllables of "therapy" with "flu," which is itself a clipping from "influenza." Apocope also appears in brand nicknames that shorten existing trademarks, like FEDEX (from FEDERAL EXPRESS); CHEVY (from CHEVROLET, plus the diminutive "-y"); METLIFE (from

90. NTOZAKE SHANGE, *even tho yr sampler broke down on you*, *in* THE LOVE SPACE DEMANDS: A CONTINUING SAGA 11, 11 (1991).

91. Crossfit, Inc. v. Lindsay Livingston, No. FA1806001793146, 2018 WL 3953671, at *6 (U.D.R.P. July 30, 2018) ("some of the most well-known trademarks in the world are . . . coined terms from clippings of words, for example, Microsoft and Netflix.").

92. *See* AMBEV (Am[erican] bev[erage]); SOFI (so[cial] fi[nance]); and DOCUSIGN (docu[ment] sign).

Metropolitan Life); and COKE (from COCA-COLA, itself purportedly apocope from the words coca[ine] and cola).

While aphaeresis clips from the beginning and apocope from the end, **ELISION** [ell-IH-zhun] leaves out internal letters or syllables from the middle of a word to shorten it (see also **SYNCOPE** [SINK-a-pee], usually defined as omitting a vowel sound). Sounds are typically elided from the middle of a word, as in TOYS 'R' US, LAND O LAKES, PEP-O-MINT, CUP-A-SOUP, SQUEEZE N' SERVE,[93] and the plethora of CHICK'N and GRAB 'N GO marks. Apocope overlaps with elision when clipped syllables from the beginning or end of a word become clipped syllables from the middle of a phrase, as with BOLOCO, NABISCO, and MANUGISTICS cited above. People who select trademarks often gravitate toward the shortest, punchiest, most concise version of a word, making clipping a convenient strategy.

The omissions in aphaeresis, apocope, and elision can lead factfinders to find words and phrases unitary. NILLA for wafer cookies;[94] MANUGISTICS for computer software that manages manufacturing logistics;[95] ACCENTURE for business consulting software and services;[96] INSTAGRAM for a social media platform for sharing photo and video content;[97] WINE-A-RITA for wine;[98] PIÑA RITA for alcoholic beverages;[99] and GRAB N' GO! for gas stations[100] are all registered without disclaimer,[101] as are CUP-A-SOUP,[102] SOFI[103] (so[cial] + fi[nance]), DOCUSIGN (docu[ment] + sign),[104]

93. *In re* Serv-A-Portion, Inc., 1 U.S.P.Q.2d 1915, 1986 WL 83345, at *2, (T.T.A.B. Sept. 26, 1986) (holding that the mark is merely descriptive for single-serving ketchup packets).

94. NILLA, Registration No. 859,776.

95. MANUGISTICS, Registration No. 1,749,141.

96. ACCENTURE, Registration No. 3,091,811.

97. INSTAGRAM, Registration No. 4,146,057.

98. WINE-A-RITA, Registration No. 3,350,731 (canceled).

99. PIÑA RITA, Registration No. 1,905,850 (canceled).

100. GRAB N' GO!, Registration No. 4,439,065; *see also* GRAB 'N GO, Registration No. 4,619,335 (registering GRAB 'N GO for chocolate milk) and GRAB'N'GO, Registration. No. 3,077,344 (registering GRAB'N'GO for refrigerator compartments) (also registered without disclaimer or evidence of secondary meaning).

101. All were also registered as inherently distinctive.

102. CUP-A-SOUP, Registration No. 1,438,216.

103. SOFI, Registration No. 4,345,122.

104. DOCUSIGN, Registration No. 2,845,169.

NABISCO,[105] BOLOCO,[106] THERAFLU,[107] FEDEX,[108] CHEVY,[109] METLIFE,[110] and COKE.[111]

Clipped marks are typically also treated as distinctive: they ostensibly satisfy the "imagination test" that factfinders often consider in determining a mark's suggestiveness. Both the USPTO and WIPO treated CBDISTILLERY as inherently distinctive for online retail store services featuring products distillated from CBD, perhaps in part because of the elided "D."[112] In a dispute between two users of the mark VALMOR, the junior user alleged on appeal that the district court had "accorded undue scope to the trademark, which, as an elision of 'value' and 'more,' [is] a weak, self-laudatory [mark] deserving of, at most, narrow protection."[113] The First Circuit acknowledged the mark was "self-laudatory" but nonetheless deemed it inherently distinctive because it was "suggestive of quality."[114] Likewise, in a dispute between the owners of the mark ARTYPE for acetate sheets with letter transfers and ART-TYPE for printing and reproduction services, the Second Circuit deemed ARTYPE inherently distinctive, reversing the district court's determination that it was unprotectable.[115]

Not all clipped terms are deemed unitary and distinctive, though. NETFLIX as a trademark for video rental and streaming services[116] and PEP O MINT for mint candy[117] were both initially refused as merely descriptive and only registered after the applicants submitted evidence of secondary

105. NABISCO, Registration No. 4,236,368.

106. BOLOCO, Registration No. 3,102,322.

107. THERAFLU, Registration No. 1,452,879.

108. FEDEX, Registration No. 1,311,503.

109. CHEVY, Registration No. 1,494,385.

110. METLIFE, Registration No. 1,541,862.

111. COKE, Registration No. 415,755.

112. CBDISTILLERY, Registration No. 6,406,909; Balanced Health Botanicals, LLC v. Privacy Serv., Provided By Withheld For Privacy Ehf/sander Cry, No. D2021-1988, 2021 WL 4427104, at *4(UDRP-ARB. Sept. 9, 2021).

113. Valmor Prod. Co. v. Standard Prod. Corp., 464 F.2d 200, 201 (1st Cir. 1972).

114. Valmor Prod. Co. v. Standard Prod. Corp., 464 F.2d 200, 201 (1st Cir. 1972).

115. Artype, Inc. v. Zappulla, 228 F.2d 695, 698 (2d Cir. 1956), *rev'g* Artype, Inc. v. Zappulla, 127 F. Supp. 33, 36 (S.D.N.Y. 1954) ("Compounding the words, and dropping the letter 't' does not render the word suggestive in the sense that 'the imaginativeness involved in the suggestion . . . is so remote and subtle that it is fanciful and not needed by other merchants of similar goods.") (citation omitted); *see also* In Adolph J. Mainzer, Inc., v. Gruberth, 260 N.Y.S. 694, 695, (N.Y. App. Div. 1932), *aff'd sub nom.* Adolph J. Mainzer, Inc., v. Gruberth, 262 N.Y. 484, 188 N.E. 30 (N.Y. App. Div. 1933) (holding APRICOATING inherently distinctive for "a product for use by bakers as a covering over fruit tarts").

116. NETFLIX, Registration No. 3,299,362.

117. PEP O MINT, Registration No. 3,380,319.

meaning. The trademark SQUEEZE N'SERV for ketchup[118] was abandoned after a final refusal for mere descriptiveness. LOBSTER GRAM for mail-order seafood[119] was registered with a disclaimer of "lobster," VIVA LA 'RITA for a special event at a restaurant chain[120] with a disclaimer of "'Rita," and TOYS "R" US for children's toys[121] with a disclaimer of "toys." The USPTO also required a disclaimer for the term "taco" in CHOCO TACO, a mark that might have benefited from being one word rather than two.[122]

The TTAB has also considered the likelihood of confusion when an applicant's mark appears to be an elision of two of opposer's existing marks. Where an applicant sought to register DEXSPAN for pharmaceutical products and the opposer owned registrations for DEXADRINE, DEXAMYL, and SPANSULE, the Board dismissed the opposition on the grounds of the opposer's "elision theory of relief," pointing to the descriptiveness and ubiquitousness of the dex- prefix and -span suffix as weighing against a likelihood of confusion.[123]

In general, courts assessing likelihood of confusion tend to deemphasize non-traditional spellings,[124] which often include clipped marks. Courts have pointed out that there's no substantial difference between, for example, BABY AND ME and BABY 'N ME.[125] At a minimum, though, elided letters and

118. SQUEEZE N'SERV, Serial No. 73,498,205.

119. LOBSTER GRAM, Registration No. 3,148,000.

120. VIVA LA 'RITA, Registration No. 5,035,241.

121. TOYS "R" US!, Registration No. 902,125.

122. The registration for stylized mark CHOCO TACO includes a disclaimer for "taco." CHOCO TACO, Registration No. 1,355,681. The registration for the plain-text word mark, however, does not include a disclaimer. That appears to be because the original application was for the unitary mark CHOC-O-TACO; a subsequent amendment to CHOCO TACO enabled the applicant to skirt the disclaimer requirement. *See* CHOCO TACO, Registration No. 1,304,008; Application to Amend Registration ("Fax incoming," Nov. 2, 2004).

123. Smith Kline & French Lab'ys v. USV Pharm. Corp., 175 U.S.P.Q. (BNA) 666 (T.T.A.B. Sept. 20, 1972). The Board noted "dex" was short for dextroamphetamine, *id.* at 668. The Board also noted that "'SPAN' had long been used in the pharmaceutical trade in multi-syllable marks to indicate the offered products are time release capsules that dissolve 'in a span of time,'" *id.* at 671.

124. *In re* McCrane, Inc., No. 85276221, 2013 WL 3129904, at *1 (T.T.A.B. Mar. 5, 2013) ("It is well established that a slight misspelling of a word will not turn a descriptive word into a non-descriptive mark if it will be perceived by consumers as the equivalent of the descriptive term." (citing *In re* ING Direct Bancorp, 100 U.S.P.Q.2d 1681, 1690 (T.T.A.B. 2011) (PERSON2PERSON PAYMENT generic))); *In re* Carlson, 91 U.S.P.Q.2d 1198, 1203 (T.T.A.B. 2009) (URBANHOUZING merely descriptive); *In re* Ginc UK Ltd., 90 U.S.P.Q.2d 1472, 1475 (T.T.A.B. 2007) (TOGGS generic); *In re* Hubbard Milling Co., 6 U.S.P.Q.2d 1239 (T.T.A.B. 1987) (MINERAL-LYX generic).

125. *In re* Kohls Illinois, Inc., No. 76149873, 2004 WL 390935, at *1 (T.T.A.B. Feb. 26, 2004); *see also In re* Columbia Ribbon & Carbon Mfg. Co., Inc., 122 U.S.P.Q. (BNA) 299, 299

sounds suggest to consumers that a user is trying to do something trademark-like rather than merely using descriptive terms in their descriptive sense. This impression makes marks that feature elision or any kind of clipping more likely to be recognized as marks and less likely to fail to function.[126]

2. Tmesis

Perhaps the opposite of clipping is a device that's even more visually and aurally striking, **TMESIS** [t'MEE-sis]. Though "tmesis" comes from the Greek "to cut," the device is more additive than subtractive. It refers to the practice of inserting a word into the middle of another word or phrase. Examples span from Shakespeare in *Richard III*: "If on the first, *how heinous e'er* it be, To win thy after-love I pardon thee," to Wayne Newton's "ri-goddamn-diculous," to the catchphrase "Legen—*wait for it*—dary" of television's *How I Met Your Mother*.[127]

Modern examples of tmesis in every language involve inserting curse words into commonplace ones; trademark examples are not much different. The Federal Register includes examples such as FAN-FRICKIN'-TASTIC[128] and FUN-FRICKIN'-TASTIC,[129] registered for restaurant and bar services; ABSO FUKU LUTELY for shirts;[130] GOOD MUHF#@KIN HAIR! for apparel;[131] and ABSOSUCKINGLUTELY for drinking straws;[132] as well as a pending application for ABSO-FOAMING-LUTELY! for mops[133] and the ultimately abandoned applications to register Well La-Di Frickin-Da[134] and

(T.T.A.B. 1959) (affirming refusal to register CARBNPAD for carbon paper, "on the ground that the word 'CARBNPAD' being the phonetic equivalent of 'carbon' and 'pad' and denoting that applicant's carbon paper is sold in pad form, is merely descriptive as applied to the goods."); *In re* Sealol, Inc., 168 U.S.P.Q. (BNA) 320, 320 (T.T.A.B. 1970) (finding GASKETAPE merely descriptive for gasket tape) ("A mere misspelling of the name of a product does not give the term such a quality as to create distinguishability and this is especially true where a repetitive consonant is elided."); *In re* McCrane, Inc., No. 85276221, 2013 WL 3129904, at *3–4 (T.T.A.B. Mar. 5, 2013) (finding SOF merely descriptive for soft dumbbells despite elision of final letter "t").

126. *See generally* Alexandra J. Roberts, *Trademark Failure to Function*, 104 IOWA L. REV. 1977 (2019).

127. The mark owner cites all three examples in its brief to the TTAB. Applicant's Appeal Brief in Support of Registration, *In re* Buffalo Wild Wings, Inc., 2011 WL 8881232, at *12 (T.T.A.B Mar. 21, 2011).

128. FAN-FRICKIN'-TASTIC, Registration No. 4,841,691.

129. FUN-FRICKIN'-TASTIC, Registration No. 4,841,692.

130. ABSO FUKU LUTELY, Registration No. 5,281,561.

131. GOOD MUHF#@KIN HAIR!, Registration No. 6,489,813 (words plus design).

132. ABSOSUCKINGLUTELY, Registration No. 4,645,817.

133. U.S. Trademark Application Serial No. 90,151,538 (filed Sept. 1, 2022).

134. U.S. Trademark Application Serial No. 87,268,488 (filed Dec. 14, 2016).

Yee-Friggin'-Haw[135] for clothing and It's Like A Whole 'Nother Internet! for web services.[136] While the insertions don't add much of substance, they may be enough to make a trademark more than descriptive or render a phrase unitary—FAN-FRICKIN'-TASTIC, ABSO FUKU LUTELY, ABSOSUCKINGLUTELY, and GOOD MUHF#@KIN HAIR! were all registered without disclaimer and treated as inherently distinctive.[137] In the wake of the Supreme Court striking down the bar on registration of scandalous and immoral marks in *Brunetti*,[138] we can expect to see more marks that incorporate tmesis. Justice Breyer in that case acknowledged that marks containing expletives "attract more attention and are harder to forget"; Breyer focused on such marks' potential to disrupt commerce, but his words also imply their effectiveness as trademarks.[139]

Applicants rarely call explicit attention to their use of tmesis. But when the USPTO refused to register BUFFALO WILD WINGS for franchise services without any disclaimer of "buffalo" and "wings,"[140] the applicant appealed the refusal. It argued that the mark was unitary because it employed tmesis by inserting "wild" in the middle of the descriptive phrase, which "places a new intensification on the entire term and lends a new unitary interpretation."[141] The Board was not swayed, concluding that the inclusion of "wild" would not lead consumers to perceive the phrase as unitary.[142]

Examples of tmesis in likelihood of confusion analyses are rare. Extrapolating from patterns in courts' treatment of rhyme and paronomasia,

135. U.S. Trademark Application Serial No. 85,252,711 (filed Feb. 26, 2011).

136. U.S. Trademark Application Serial No. 78,963,427 (filed Aug. 30, 2006).

137. ABSO-FOAMING-LUTELY was also treated as inherently distinctive and published without disclaimers; it is currently awaiting a statement of use. U.S. Trademark Application Serial No. 90,151,538 (filed Sept. 1, 2020).

138. Iancu v. Brunetti, 139 S. Ct. 2294, 2296 (2019).

139. "[S]cientific evidence suggests that certain highly vulgar words have a physiological and emotional impact that makes them different in kind from most other words . . . These attention-grabbing words, though financially valuable to some businesses that seek to attract interest in their products, threaten to distract consumers and disrupt commerce." *Id.* at 2307 (*citing* M. MOHR, HOLY S***: A BRIEF HISTORY OF SWEARING 252 (2013); Timothy Jay, Catherine Caldwell-Harris & Krista King, *Recalling, Taboo and Nontaboo Words*, 121 AM. J. PSYCH. 83, 83–86 (2008)).

140. *In re* Buffalo Wild Wings, Inc., No. 77654679, 2011 WL 7005530, at *1 (T.T.A.B. Dec. 21, 2011).

141. Applicant's Appeal Brief in Support of Registration at 13, *In re* Buffalo Wild Wings, Inc., No. 77654679, 2011 WL 8881232 (T.T.A.B. Mar. 21, 2011).

142. *In re* Buffalo Wild Wings, No. 77654679, 2011 WL 7005530, at *4 (T.T.A.B Dec. 21, 2011). The Board noted that it found "particularly unconvincing applicant's comparison of its mark BUFFALO WILD WINGS to Shakespeare's use of tmesis in the [quoted] passage from 'Richard III.'" *Id.* at *4 n.6.

discussed further below, we might expect that use of tmesis in either an infringement plaintiff's or defendant's mark might render a pair of marks less similar, while use of tmesis in both—ABSOFUCKINGLUTELY and ABSOSUCKINGLUTELY, both for drinking straws, for example—might render the marks more similar.

3. Punctuation

PUNCTUATION is not traditionally included in lists of poetic devices, but scholars have spilled a great deal of ink discussing its deliberate use in poetry to great effect. Poets like Emily Dickinson and E. E. Cummings are known for their creative use of punctuation and other typographical symbols to create ambiguity and play with meaning.[143] See, for example, E. E. Cummings' use of parentheses, colons, semicolons, and enjambment to alter meaning and add visual effects in stanzas like:

> (i who have died am alive again today,
> and this is the sun's birthday;this is the birth
> day of life and of love and wings:and of the gay
> great happening illimitably earth).[144]

Trademarks also play with punctuation for emphasis, as in YAHOO! for websites and other internet services[145] or DOT.BOOM! for speakers.[146] Producers can use punctuation to create a compound word like CHEEZ-IT for crackers;[147] BAND-AID for bandages;[148] or POCKET.WATCH for entertainment brand consulting services.[149] They may also incorporate nontraditional characters to make a mark visually interesting, like dELiA*s for clothing;[150] (RED) for charitable services;[151] and RO*TEL for canned food.[152] Other times, the punctuation stands in for an equivalent word: DISNEY+ for a video streaming service;[153] &PIZZA for pizza restaurants;[154]

143. *See, e.g.*, Roi Tartakovsky, *E. E. Cummings's Parentheses: Punctuation as Poetic Device*, 43 STYLE, Summer 2009, at 215–47.

144. E. E. CUMMINGS, *i thank You God for most this amazing*, *in* XAIPE 65 (W.W. Norton & Co, 1997).

145. YAHOO!, Registration No. 2,040,222.

146. DOT.BOOM!, Registration No. 5,763,630.

147. CHEEZ-IT, Registration No. 151,785; CHEEZ-IT, Registration No. 4,624,992.

148. BAND-AID, Registration No. 194,123.

149. POCKET.WATCH, Registration No. 6,393,369.

150. DELIA*S, Registration No. 4,678,702.

151. (RED), Registration No. 3,726,784.

152. RO*TEL, Registration No. 5,049,852.

153. DISNEY+, Registration No. 6,351,110.

154. &PIZZA, Registration No. 5,834,696.

FOLDING@HOME for computer software.[155] Punctuation can also create double meaning, the way the period in I.CONIC sets the "I" apart from the complete word "iconic."[156]

Use of punctuation often results in treatment of marks as unitary and distinctive—every mark listed above was registered without disclaimer or proof of secondary meaning. But when a mark is clearly descriptive or contains descriptive or generic terms, the use of punctuation won't necessarily enable it to overcome those issues: marks may be treated as merely descriptive, like "FOR WALKING" for shoes[157] or (RED) for wine;[158] or registered with disclaimers, like THE F*CK IT DIET for diet and lifestyle books[159] and FISH SH!T ORGANIC SOIL CONDITIONER SOIL WEEKLY for soil conditioner.[160]

Courts considering punctuation have generally held slight differences in punctuation or capitalization insufficient to defeat a finding that two marks are similar.[161] Specifically, courts have held "iTan" and "i.tan,"[162] MIRACLE GRO and MIRACLE-GRO,[163] SUN-EARTH and SUNEARTH,[164] SPIGA and S.P.I.G.A.,[165] and CONTACT and CON-TACT[166] similar enough to weigh toward a likelihood of confusion. The *Miracle-Gro* court noted that:

155. FOLDING@HOME, Registration No. 3,250,544.

156. I.CONIC, Registration No. 6,575,615 (showing the trademarked name of the I.CONIC clothing brand).

157. U.S. Trademark Application Serial No. 90,277,796 (filed Oct. 26, 2020). Applicant requested reconsideration of a finding of mere descriptiveness to the TTAB, which remanded to the examiner based on request for reconsideration.

158. When the examining attorney found (RED) merely descriptive for wine, the applicant dropped "wine" from its list of goods and services. (RED), Registration No. 3,726,784.

159. THE F*CK IT DIET, Registration No. 6,125,614; *see also* F*CK YO PODCAST, Registration No. 6,298,048 (disclaiming "podcast"); F*CK THE SMALL TALK, Registration No. 6,523,785 (showing trademark for card game with no disclaimer).

160. FISH SH!T ORGANIC SOIL CONDITIONER SOIL WEEKLY, Registration No. 6,757,113 (disclaiming "fish shit," "soil," and "organic soil conditioner").

161. *See, e.g.*, USA Visionary Concepts, LLC v. MR Int'l, LLC, No. 4:09-cv-00874, 2009 WL 10672094, at *4 (W.D. Mo. Nov. 17, 2009).

162. *Id.*

163. Stern's Miracle-Gro Prods., Inc. v. Shark Prods., Inc., 823 F. Supp. 1077, 1086 (S.D.N.Y. 1993) (calling the marks "virtually identical").

164. SunEarth, Inc. v. Sun Earth Solar Power Co., 846 F. Supp. 2d 1063, 1077–78 (N.D. Cal. 2012).

165. Pastificio Spiga Societa Per Azioni v. De Martini Macaroni Co., 200 F.2d 325, 326 (2d Cir. 1952) (holding that the marks "carried an essentially identical significance to a buyer.").

166. Stix Prods., Inc. v. United Merchs. & Mfrs., Inc., 295 F. Supp. 479, 486 (S.D.N.Y. 1968).

> The fact that [plaintiff] uses a hyphen in its mark, while [defendant] does not, is too minor a difference to be classified as significant by the Court. It is extremely unlikely that such a minor difference would be noticed by consumers and it is undetectable when the two marks are spoken.[167]

Multiple courts have also found sufficient similarity for successful cybersquatting claims where defendants only changed the marks for their domain names by removing a hyphen from plaintiffs' marks and domain names.[168] On the other hand, a court dismissed a trademark counterfeiting claim by finding the two marks in question non-identical, including because defendant's use of "playmotion!" differed from plaintiff's WII PLAY MOTION in the defendant's use of lowercase, omitted space, and exclamation point.[169]

4. Personification

While clipping devices alter a mark's appearance, other types of poetic devices call upon the power of "sight" by leading consumers to envision something beyond the mark before them. **PERSONIFICATION** [per-SON-if-ih-kay-shun] refers to assigning human qualities to something that isn't human, as Sylvia Plath does in "The Mirror":

> I am silver and exact. I have no preconceptions.
> Whatever I see I swallow immediately
> Just as it is, unmisted by love or dislike.
> I am not cruel, only truthful,
> The eye of a little god, four-cornered.

Personification dominates certain categories of trademarks—think of all the mascots from sports to cereal;[170] the "mister" marks;[171] the logos that feature

167. *Stern's Miracle-Gro Prod., Inc.*, 823 F. Supp. at 1086.

168. Agri-Supply Co. v. Agrisupply.Com, 457 F. Supp. 2d 660, 663 (E.D. Va. 2006) (noting that the cybersquatter-owned domain "Agrisupply.com" was confusingly similar to plaintiff's domain name "Agri-Supply.com"); Bioclin BV v. Multygyn USA, LLC, 72 F. Supp. 3d 1288, 1296 (M.D. Fla. 2014) (holding that defendant's use of multigyn.com violated the Anticybersquatting Consumer Protection Act based on its similarity to plaintiff's MULTI-GYN mark and domain names).

169. Playvision Labs, Inc. v. Nintendo of Am., Inc., No. C14-05365, 2015 WL 12941892, at *1 (N.D. Cal. May 18, 2015).

170. *See, e.g.*, Ollie v. Domino's Pizza, Inc., No. 95CIV10333, 1997 WL 529049, at *1 (S.D.N.Y. Aug. 25, 1997) (regarding Donny Domino, the anthropomorphized domino of Domino's Pizza).

171. *See, e.g.*, *In re* Lombardo, No. 74/468,937, 1999 WL 590699, at *4 (T.T.A.B. July 30, 1999) (affirming refusal for one anthropomorphic MR. PITA mark based on likelihood of confusion with another anthropomorphic MR. PITA mark); *In re* Kiriakos Christoforakis, No.

oranges or baseballs with arms and legs and human expressions; the animals of every stripe speaking, wearing clothes, or communicating judgment. Owners of design marks [172] and trade dress [173] often cite their marks' resemblance to human forms to bolster their claims of distinctiveness.

But personification is not limited to visual trademarks. Marketers have long recognized the value of using the "pathetic fallacy" to "ascribe human emotional characteristics to products," as in the upbeat CHEERIOS for breakfast cereal. [174] Word marks that assign human emotions, moods, attributes, or actions to inanimate objects are plentiful. For example, the Principal Register contains registrations for SURLY for bicycles;[175] SINGING SUN for coffee shops;[176] CHEERFUL CHOCOLATE for baking mixes;[177] CREATIVE COW for software; [178] and THE FRIENDLY TOAST for restaurant services.[179] And those represent just a tiny sample. Many companies have sought to turn widely-recognized personifications into trademarks, as

86599436, 2018 WL 1871444, at *6 (T.T.A.B. Apr. 5, 2018) (affirming refusal for anthropomorphic MR. PIZZAS mark based on likelihood of confusion with anthropomorphic MR. PIZZA mark); *In re* William Bonofiglo, No. 86733206, 2017 WL 1684174 (T.T.A.B. Mar, 28, 2017) (affirming refusal for anthropomorphic MR. TACO mark based on likelihood of confusion with anthropomorphic MR. TACO mark) ("We . . . find the connotation and commercial impression of both marks to be quite similar, if not identical. The use of the title MISTER/MR. with the word TACO, along with the design elements in each mark create the impression of a taco-related character or personification.").

172. Donut Joe's, Inc. v. Interveston Food Servs., LLC, 101 F. Supp. 3d 1172, 1181–82 (N.D. Ala. 2015) (reasoning that elements of the DONUT JOE'S LOGO, such as "the anthropomorphized donut character . . . do not make the connection between the mark and the store's goods any less straightforward; if anything, adding those elements makes it even more clearly descriptive of the store's goods.").

173. *See, e.g.*, *In re* Compagnie Gervais Danone, No. 75/621,184, 2001 WL 1313588, at *4 n.13 (T.T.A.B. Oct. 22, 2001) ("In regard to the asserted anthropomorphism of the [bottle] design, applicant states the design 'may suggest the appearance of a creature, such as a snowman or one of the roly-poly animals featured in Applicant's advertising and labeling.'"); *In re* Saey N.V., No. 75826909, 2005 WL 2451652, at *3 (T.T.A.B. Sept. 21, 2005) (rejecting applicant's "creative" claim that the ventilation holes on its grill will be perceived by consumers as eyes and a mouth).

174. Vanden Bergh et al., *supra* note 35, at 39–40.

175. SURLY, Registration No. 2,594,176.

176. SINGING SUN, Registration No. 5,940,124.

177. CHEERFUL CHOCOLATE, Registration No. 4,524,661 (disclaiming "chocolate").

178. CREATIVE COW, Registration No. 3,411,445.

179. THE FRIENDLY TOAST, Registration No. 4,845,512.

with LADY LUCK[180] for casinos, and BLIND JUSTICE for wine,[181] capitalizing on the phrases' preexisting cultural resonance. The marks listed above were registered without disclaimer, including compound marks like THE FRIENDLY TOAST. But NAUGHTY PINE BREWING CO.,[182] DAYDREAMING BREWING COMPANY,[183] ANGRY FISH BREWING CO.,[184] DEPLORABLE BREWING CO.,[185] LEADER BREWING,[186] REVOLUTION BREWING,[187] and BLOOD BROTHERS BREWING,[188] all registered for coffee, beer, or brewery services, each disclaim "brewing" in their registrations, suggesting the use of personification won't render a mark unitary when it contains clearly generic terms.

Applicants and mark owners have also pointed to personification in their word marks to support assertions of distinctiveness, to varying degrees of success.[189] In one dispute, a junior user argued that the senior user's mark GUZZLER for "vehicle-mounted vacuum loading, transporting and dumping machines" was suggestive at best and thus not entitled to as broad a scope of protection as a fanciful or arbitrary mark; the examining attorney cited dictionary evidence and "counter[ed] with the observation that 'applicant's machinery cannot "drink greedily" or "consume to excess," thus, the term

180. Isle of Capri Casinos, Inc. v. Flynt, No. 2:16-cv-06148, 2016 WL 6495380, at *4 (C.D. Cal. Nov. 1, 2016) (deeming LADY LUCK for casino, restaurant, hotel, bar, and related services and LUCKY LADY for slot machine games inherently distinctive but nonetheless weak marks and denying plaintiff's application for a preliminary injunction against defendant's use of "Larry Flynt's Lucky Lady Casino" as the name of a casino).

181. BLIND JUSTICE, Registration No. 3,326,534.

182. NAUGHTY PINE BREWING CO., Registration No. 6,668,000.

183. DAYDREAMING BREWING COMPANY, Registration No. 6,281,053.

184. ANGRY FISH BREWING CO., Registration No. 5,840,899.

185. DEPLORABLE BREWING CO., Registration No. 6,484,724.

186. LEADER BREWING, Registration No. 6,768,843.

187. REVOLUTION BREWING, Registration No. 6,819,049.

188. BLOOD BROTHERS BREWING, Registration No. 6,715,278.

189. Coach Servs., Inc. v. Triumph Learning LLC, 96 U.S.P.Q.2d 1600, 2010 WL 3798519, at *18 (T.T.A.B. Sept. 17, 2010), *aff'd*, Coach Servs., Inc. v. Triumph Learning LLC, 668 F.3d 1356, 1378 (Fed. Cir. 2012) ("While the word 'Coach' is a personification of the act of instructing or tutoring for an examination, it is not sufficiently metaphorical to be suggestive."); *In re* Ziff-Davis Inc., No. 75/178,551, 2000 WL 132545, at *1–2 (T.T.A.B. Jan. 28, 2000) (affirming refusal to register SOFTWARE BUYER as a mark for computer-related products based on mere descriptiveness despite applicant's argument that the use of "buyer" constitutes personification and renders the mark suggestive); *In re* Chesebrough-Ponds's Inc., 163 U.S.P.Q. (BNA) 244, 245 (T.T.A.B. 1969) (holding MANICURIST BY CUTEX suggestive for nail polish because it indicated professional results achievable—those a manicurist would achieve—rather than describing purchasers); *In re* Coca-Cola Bottling Co. of Los Angeles, 49 F.2d 838, 839 (C.C.P.A. 1931) (holding that JACK FROST, "defined . . . as 'the personification of wintry weather," was suggestive for extracts and syrups).

'GUZZLER,' when applied to the identified goods, is fanciful, invoking vividly personified visualizations of greedy eating machines gobbling up earth and mud.'"[190]

Courts have occasionally found personification or anthropomorphism to weigh toward a finding of similarity and likelihood of confusion when both parties use marks that personify their products in the same way, as when two beverage companies used oranges with faces;[191] two producers of cardboard play structures used "color me" marks, "ascribing an anthropomorphic quality to the cardboard product";[192] two toymakers used BRAINY BLOCKS and MR. BRAIN BUILDER;[193] and a maker of lingerie and a shoe company each chose a version of "lonely" to modify its bras and shoes.[194] In other cases,

190. *In re* Tibban, No. 76639252, 2007 WL 2972198, at *2–3 (T.T.A.B. Sept. 14, 2007) (the Board affirmed the refusal to register, noting "[w]e are not persuaded that the term GUZZLER when used in connection with the goods involved in this appeal should be accorded a reduced level of protection so as to allow the registration of applicant's mark.").

191. *See, e.g.*, Home Juice Co. v. Runglin Cos., 231 U.S.P.Q. 897, 1986 WL 83744, at *3–4 (T.T.A.B. Oct. 3, 1986) (granting petition to cancel registration based on similarity of two anthropomorphic orange designs used for beverages).

192. Color Me House, Inc. v. Discovery Commc'ns, Inc., No. C12-5935 RJB, 2013 WL 1283806, at *6 (W.D. Wash. Mar. 27, 2013) (granting preliminary injunctive relief for plaintiff and finding "[the similarity] factor favors [plaintiff]."). In a case assessing whether defendant's use of DISCOVERY KIDS COLOR ME PLAYHOUSE and DISCOVERY KIDS COLOR ME ROCKETSHIP for cardboard play structures infringed plaintiff's marks COLOR ME HOUSE and COLOR ME ROCKET for similar goods, the court found the similarity factor weighed toward a likelihood of confusion. It emphasized that "'COLOR ME' is the unique feature of [plaintiff's] trademarks, ascribing an anthropomorphic quality to the cardboard product. Use of 'Color Me' by [defendant] appropriates that quality." *Id.* The court seems to imply that since the defendant's use of the same phrase personifies the products in the same way—such that the products themselves are urging children to color them—it renders the uses more similar than some more straightforward shared use of the verb "color" might have.

193. Or Da Indus., Ltd. v. Leisure Learning Prod., Inc., 479 F. Supp. 710, 717–18 (S.D.N.Y. 1979). Likewise, in a case comparing senior user's BRAINY BLOCKS with alleged infringer's MR. BRAIN BUILDER, both for toys and games, the court points out that "[b]oth marks used the word 'brain' and in neither case does it describe the product." *Id.* at 717. The court also notes both marks' alliteration of "B," consonance of "L," and focus on construction in finding the marks similar. *Id.*

194. *In re* Lonely Hearts Club Ltd., No. 79174419, 2017 WL 6033943, at *6 (T.T.A.B. Nov. 15, 2017) (affirming refusal to register under 2(d)). Similarly, an applicant seeking to register LONELY as a stylized word mark for lingerie tried to rebut the USPTO's refusal based on a likelihood of confusion with LONELYSHOES for shoes, arguing that "the combined term LONELYSHOES has an anthropomorphizing effect that is absent from Applicant's mark LONELY .... LONELYSHOES suggests the idea of shoes that are unhappy because they are alone; while LONELY applied to lingerie suggests a person, the wearer, who is unhappy and alone." *Id.* at *5. The TTAB resisted that characterization because the emotional state of being "lonely" personifies shoes, lingerie, or their wearers equally and so does not increase the likelihood consumers will distinguish between the marks: "Both marks

though, factfinders have found no likelihood of confusion in disputes in which both parties' visual or verbal marks employ personification in the same way.[195] Personification has even come up in the context of the now-defunct bar on registration of scandalous or immoral marks.[196] When one mark employs verbal or visual personification or anthropomorphism and the other does not, parties may argue that such a discrepancy weighs against a finding of similarity; courts and the Board sometimes agree[197] and sometimes disagree.[198]

The poetic devices discussed in this Section—aphaeresis, apocope, elision, tmesis, punctuation, and personification—represent just some of the ways that producers create or select a visually striking mark. Whether that carefully (or

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at issue are susceptible to both of the possible interpretations proposed by Applicant. That is, in both marks the term LONELY . . . could be perceived as saying something about the product or about the wearer of the product." *Id.* at * 5.

195. Kellogg Co. v. Green Turtle Bay Vitamin Co., Inc., No. 113,043, 2002 WL 976447, at *3 (T.T.A.B. May 10, 2002) (finding no likelihood of confusion between two differently-depicted personified sun logos); Kansas City Royals Baseball Corp. v. Anschutz Manchester Hockey LLC, No. 91163833 , 2008 WL 5256409, at *16 (T.T.A.B. Dec. 9, 2008) (finding lion mascots "create different overall commercial impressions in that Sluggerrr, because of his 'Royals' jersey and baseball uniform, would be perceived to be a mascot for a baseball team named the 'Royals,' while Max, because of the 'M' on his jersey, would be perceived to be a mascot of a sports team for which the letter "M" has some significance.").

196. *In re* Bad Frog Brewery, Inc., Nos. 74/701,058, 75/018,931, 1999 WL 149819, at *1 (T.T.A.B. Mar. 16, 1999) (discussing at length whether a frog in a design mark would be perceived by consumers as "giving the finger" and, if so, whether that renders it scandalous).

197. *See, e.g.*, Instant Media, Inc. v. Microsoft Corp., No. C 07-02639, 2007 WL 2318948, at *9 (N.D. Cal. Aug. 13, 2007) ("While both marks make use of the letters I and M, Microsoft's mark uses them in lower-case, is a particular shade of blue-green, and uses especially stylized font designed to make the 'i' appear anthropomorphic. Further, the apostrophe used by the Microsoft mark suggests a speech balloon," setting the marks apart); Steve's Ice Cream v. Steve's Famous Hot Dogs, 3 U.S.P.Q.2d 1477, 1987 WL 124289, at *2 (T.T.A.B. 1987) (highly stylized design portion of applicant's mark featuring "humanized frankfurters, prancing arm in arm to musical notes, creates a distinctive commercial impression" that helps distinguish it from opposer's mark).

198. *See, e.g.*, *In re* Bruce M. Ackerman, No. 86469261, 2016 WL 3566138, at *2 (T.T.A.B. June 1, 2016) (Applicant "asserts that the prominent design in his mark of an anthropomorphic figure depicting a 'pizza cone' refers to Applicant's specific type of pizza parlor services; and that as a consequence, the word CONEHEADS 'clearly and unequivocally conveys the impression of . . . a 'pizza cone' figure with a large head.' . . . Applicant's arguments are unpersuasive."); Fetching Designs LLC DBA Smart Cookie v. The Smartcookee Co. LLC, No. 85849852, 2015 WL 7273028, at *10 (T.T.A.B Oct. 26, 2015) ("The design of a stylized anthropomorphic dog wearing a bow tie and glasses reinforces the wording SMART COOKEE" and thus does not distinguish applicant's design mark from opposer's word mark; "both marks suggest treats for clever dogs."); *In re* Munky Bars USA, Inc., No. 78506899, 2007 WL 1697341, at *3–4 (T.T.A.B. Jun. 7, 2007) (affirming refusal to register design mark featuring "the words MUNKY BARS split by a caricature of an anthropomorphized banana on a stick" based on a likelihood of confusion with MONKEY BARS for similar novelty desserts).

not so carefully) cultivated "sight" impression translates to consumers in a way that makes the mark more likely to be distinctive and unitary and whether it impacts a similarity analysis seems to vary case-by-case and device-by-device but may provide useful fodder for owners and advocates.

B. SOUND

In trademarks, as in poetry, sound matters—how a word or phrase is pronounced, how it sounds to the ear, how it scans. The following devices particularly affect mark sounds and consumers' perception of them. The first set—alliteration, assonance, and consonance—employs repetitions of letters or letter sounds. The second, anaphora and epizeuxis, repeat entire words for effect. And onomatopoeia and rhyme, each well-known and widely-used, stand alone.

1. Repetition of Sounds: Alliteration, Assonance, & Consonance

ALLITERATION [uh-LIT-er-ay-shun] refers to the use of the same letter sound at the start of successive words. Alliteration is ubiquitous in trademarks, slogans, and marketing language. It draws attention to the words themselves, sometimes using sound symbolism or onomatopoeia to add meaning to a phrase. Alliteration can render a phrase catchier, more memorable, and more pleasing to read and say. Many idiomatic expressions ("dull as dirt"; "baby boomer")[199] rely on alliteration, as do trademarks like BURT'S BEES,[200] TATER TOTS,[201] MEOW MIX,[202] and PAYPAL.[203] "Alliteration" is often used as a catch-all by applicants, litigants, and factfinders who note some recurring sounds or letters[204] when the more precise term might be "assonance," "consonance," or in some cases none of the above.

ASSONANCE and CONSONANCE [ASS-a-nince and CONS-a-nince] are similar to—and often confused with—alliteration, but they refer to the use of repeating vowel sounds and consonant sounds, respectively. While alliteration involves the repetition of letters or sounds at the beginning of each word in a phrase, assonance and consonance include repetition *within* words or phrases as well. Poets often use a mix of alliteration, assonance, and

199. Examples drawn from John McDaniel, *Reasons We Use Alliteration*, PEN & THE PAD, (July 29, 2022), https://penandthepad.com/reasons-use-alliteration-22227.html.

200. BURT'S BEES, Registration No. 2,171,302.

201. TATER TOTS, Registration No. 0,668,762.

202. MEOW MIX, Registration No. 1,995,276.

203. PAYPAL, Registration No. 2,959,971.

204. *See, e.g.*, Safe-T Pac. Co. v. Nabisco, Inc., 204 U.S.P.Q. (BNA) 307, 316 (T.T.A.B. 1979) (Board characterizes mark KRAZY GLAZY as alliterative).

consonance to create a particular effect—in the opening stanzas of Donna Masini's "Slowly," the repeated "s's" also employ onomatopoeia:

> I watched a snake once, swallow a rabbit.
> Fourth grade, the reptile zoo
> the rabbit stiff, nose in, bits of litter stuck to its fur,
>
> its head clenched in the wide
> jaws of the snake, the snake
> sucking it down its long throat.
>
> All throat that snake—I couldn't tell
> where the throat ended, the body
> began. I remember the glass
>
> case, the way that snake
> took its time

The devices also tend to overlap in trademarks. While the marks FAST FEATURE PLATFORM[205] and TEN TON TITMOUSE employ alliteration, each demonstrates consonance as well—the "f" that begins "fast" and "feature" reappears in the middle of "platform," and the "t" that starts each separate word in "ten ton titmouse" is doubled in "titmouse"—such that those letters dominate the marks even more than might be apparent at first glance. The two components of BREAK & BAKE alliterate, sharing their opening letter "b," but the consonance of "k" at the end of each further contributes to the mark's catchiness.[206] And the owner of FROZEN ROSÉ for wine succeeded in registering its mark without disclaimer, asserting in an office action response that "[b]ecause of the repetitive phonetic sound 'OZE' (with a long 'o') in both FROZEN and ROSÉ, the expression has an 'alliterative lilting cadence,' as did the mark" LIGHT N' LIVELY for reduce calorie mayonnaise in *Kraft*.[207]

The TTAB and courts have discussed the effect of alliteration in marks in many cases adjudicating unitariness, distinctiveness, and similarity. In response to an argument that alliteration rendered LEAN LINE for low calorie foods unitary, the Board noted "there is nothing in the record to suggest that the

205. *In re* Siemens Stromberg-Carlson, No. 75/048,293, 1999 WL 1062812, at *1 (T.T.A.B. Nov. 19, 1999).

206. J & J Snack Foods Corp. v. Nestle USA, Inc., 149 F. Supp. 2d 136, 151 (D.N.J. 2001) (holding BREAK & BAKE descriptive, but not generic, for scored raw cookie dough).

207. U.S. Trademark Application Serial No. 77,071,957 (filed Dec. 27, 2006), Response to Office Action (Oct. 25, 2007); *In re* Kraft, Inc., 218 U.S.P.Q. (BNA) 571, 571 (T.T.A.B. 1983); *see also In re* Pecan Ridge Vineyards, LLC, 2009 WL 4073496 at *3 (T.T.A.B. May 13, 2009) (holding "the mark is not merely descriptive due to its double entendre").

mere fact that both words which form the mark begin with the letter 'L' would cause purchasers to miss the merely descriptive significance of the term 'LEAN' or consider the entire mark to be a unitary expression."[208] Likewise, alliteration did not render WOODY WHEAT unitary for beer; the Board acknowledged that while "[i]n rare cases, alliterative marks . . . can encourage persons encountering the mark to perceive the mark as a whole . . . alliteration in and of itself does not render a mark unitary."[209] Those cases stand in contrast to the oft-cited "alliterative, lilting cadence" that rendered LIGHT 'N LIVELY unitary and distinctive to the Board.

Alliteration is also frequently offered by applicants to support a finding that a mark is not merely descriptive or generic but is in fact inherently distinctive. While that argument may be helpful in persuading an examining attorney to publish the mark, applicants who appeal refusals to the TTAB rarely succeed based on alliteration alone. The Board has held merely descriptive or generic marks including WASHWAX for a product that washes and waxes a vehicle;[210] KAMO KIDS for camouflage-patterned diapers;[211] TUESDAY TRADEMARK TIP for weekly tips from a trademark attorney;[212] SOUP SINGLES for single-serving soups;[213] TINY TEDDY TEES for stuffed animal clothing;[214] and SOLID SELECT for wood products.[215] The applicant in the last case emphasized not only the mark's alliteration but its

208. *In re* Lean Line, Inc., 229 U.S.P.Q. (BNA) 781, 782 (T.T.A.B. 1986).

209. *In re* Austin Bros.' Beer Co., LLC, No. 86545695, 2016 WL 7646391, at *3 (T.T.A.B. Dec. 13, 2016) (non-precedential) (quotations omitted).

210. Turtle Wax, Inc. v. Blue Coral, Inc., 2 U.S.P.Q.2d 1534,1536 (T.T.A.B.1987).

211. *In re* Keith Stonebraker, No. 77613568, 2011 WL 4090440, at *3 (T.T.A.B. Sept. 2, 2011) ("we find that the alliteration is not sufficient to create a distinct commercial impression separate from the descriptive meanings.").

212. *In re* Erik M. Pelton & Assocs., Pllc, No. 85817818, 2015 WL 2412168, at *4 (T.T.A.B. Apr. 29, 2015).

213. *In re* Somerset Soup Works, Inc., No. 85034559, 2014 WL 1827012, at *4 (T.T.A.B. Apr. 22, 2014) (affirming refusal to register the mark based on descriptiveness and failure to disclaim soup).

214. *In re* Shirts Illustrated, LLC, No. 75/708,751, 2003 WL 21371594, at *2 (T.T.A.B. Jun. 10, 2003) ("The words TINY TEDDY TEES do not lose their descriptive significance because of the alliteration of the 'T's' and the assonance of the 'EE's').

215. *In re* Tenon Ltd., No. 86218698, 2015 WL 8966269, at *4 (T.T.A.B. Nov. 23, 2015); *see also*, *e.g.*, *In re* Lumera Corp., No. 78564687, 2007 WL 3336392, at *5 (T.T.A.B. Oct. 11, 2007) (PROTEOMICPROCESSOR, composed of the descriptive terms "proteomic" and "processor," for surface plasmon resonance instruments); *In re* Siemens Stromberg-Carlson, No. 75/048,293, 1999 WL 1062812, at *2 (T.T.A.B. Nov. 19, 1999) (FAST FEATURE PLATFORM for telecommunications software and hardware); *In re* Kikkoman Sales USA., Inc., 2013 WL 3090447, at *3 (T.T.A.B. Apr. 29, 2013) (SOYSALT for seasonings).

incongruity, "rhythmic . . . quality," and the "matched, balance closed syllable structures" of the two words, to no avail.[216]

Federal courts, likewise, have held merely descriptive the alliterative BEEF & BREW for restaurant services;[217] BREAK & BAKE for scored raw cookie dough;[218] and KUF 'N KOLAR for stain spray.[219] The Federal Circuit enthusiastically reversed the TTAB in one case, deeming SNAP SIMPLY SAFER merely descriptive for medical syringes and ordering cancellation of the registration. It handily dismissed the argument that the mark's alliteration served as evidence it was more than descriptive. Instead, the court maintained "[t]he record . . . contains no evidence indicating that a consumer would focus on the alliteration formed by SNAP, SIMPLY, and SAFER, or that such alliteration would require a consumer to take the inferential step that the Board described."[220] Of course, those cases represent the exception more than the rule—where many applicants successfully register alliterative marks as inherently distinctive or unitary without much fanfare, only those whose applications were unsuccessful challenge the refusal to the TTAB.

Alliteration has factored into likelihood of confusion analyses as well. One district court comparing CASUAL CORNER and CORNER CASUALS for retail store services opined that "the phonetic similarity, the cadence and the alliteration leads me to conclude that the likelihood of consumer confusion is virtually inevitable."[221] The TTAB, comparing challenger's mark TITMOUSE with respondent's mark TEN TON TITMOUSE for different goods in a cancellation proceeding, pointed to the latter's alliteration as helping distinguish the marks from one another: "The presence of TEN TON in

216. *In re* Tenon Ltd., 2015 WL 8966269, at *4.

217. Beef & brew, inc. v. Beef & Brew, Inc., 389 F. Supp. 179, 184 (D. Or. 1974) ("A name that tells the diner what his dinner will be is descriptive.").

218. *See* J & J Snack Foods Corp. v. Nestle USA, Inc., 149 F. Supp. 2d 136, 151 (D.N.J. 2001) (finding the mark descriptive because "it inform[ed] the consumer about the functional characteristics of the refrigerated cookie dough, without requiring any significant mental gymnastics.").

219. Norsan Prod., Inc. v. R. F. Schuele Corp., 286 F. Supp. 12, 14 (E.D. Wis. 1968) (finding the mark descriptive with secondary meaning and enjoining defendant's use of CUFF & COLLAR CLEANER for a similar product).

220. DuoProSS Meditech Corp. v. Inviro Med. Devices, Ltd., 695 F.3d 1247, 1255 (Fed. Cir. 2012).

221. Casual Corner Assocs. v. Weinel, 309 F. Supp. 705, 707 (S.D. Fla. 1970) (ultimately ruling in favor of the defendant despite the strong language finding the marks confusingly similar).

Respondent's mark creates a three-word alliteration and incongruence not present in Petitioner's one-word mark."[222]

Trademark owners sometimes struggle to articulate the patterns they identify in trademarks, mixing up the names of devices or dismissing an argument because it labels a device incorrectly. For example, when the owner of PLATFORM EQUINIX for co-location services asserted the mark was unitary due to its "alliterative lilting cadence . . . ." The Board made short work of that argument, noting "[t]his term is clearly not 'alliterative' and we find nothing 'lilting' about it."[223] Likewise, when Kohr sought to register KOHR BROS. ORIGINAL ORANGEADE SUPREME and KOHR BROS ORIGINAL ORANGE CRÈME for "frozen custard shakes," the USPTO required disclaimers of all terms besides "Kohr," and the TTAB affirmed.[224] The Board was not swayed by Kohr's argument that both marks incorporated "alliteration and rhythmic sounds." Kohr was likely, albeit clumsily, attempting to draw the Board's attention to the repeated Rs in every word of both marks as well as the assonance of O-sounds in nearly every word. And of course, the two work in tandem, such that most of the words in each mark repeat the sound "or"—K*ohr*, *o*riginal, *o*rangeade or *o*range—creating internal rhyme. But the Board did not acknowledge those patterns, perhaps because of the awkward way Kohr characterized them. The same misarticulation occurred when an applicant sought to convince the Board that WETTECHNOLOGIES as a trademark for machines and machine tools constituted a unitary, suggestive mark, citing its "rhyming pattern" and "use of alliteration."[225] The Board acknowledged the repeated "t" but dismissed the applicant's mischaracterization of the mark's devices.[226]

Of course, courts and the TTAB—and not just the trademark owners who come before them—also have a history of using "alliteration" broadly to include internal consonance or assonance. A district court found a likelihood of confusion between PORTASHADE and PLAY-N-SHADE, both for

222. Titmouse, Inc. v. Andrew Dickerson, No. 92066512, 2019 WL 2188739, at *7–8 (T.T.A.B. May 16, 2019) (ultimately concluding that the similarity of the marks factor weighed toward a likelihood of confusion but declining to cancel TEN TON TITMOUSE).

223. *In re* Equinix, Inc., No. 85123800, 2012 WL 2588571, at *3 (T.T.A.B. June 5, 2012).

224. *In re* Kohr Bros., Inc., No. 78954996, 2008 WL 4877064, at *1 (T.T.A.B. Nov. 4, 2008).

225. *In re* Wet Techs., Inc., No. 77135323, 2012 WL 3224708, at *12 (T.T.A.B. July 20, 2012). The mark also incorporated a design element.

226. *Id.* at *13 ("While we must take account of differing pronunciations of trademarks, we do not see any possible way to vocalize WETTECHNOLOGIES so that it rhymes or alliterates; the words neither end in the same sound (rhyme), nor do they begin with the same sound (alliterate) . . . . In short, there is nothing about the appearance or sound of WETTECHNOLOGIES that changes its descriptive meaning.").

portable shade structures,[227] noting PORTASHADE "has a similar alliterative sound as" PLAY-N-SHADE, "exacerbat[ing] . . . the potential for confusion" between the two.[228] Of course, neither mark alliterates. And in holding SPORTSWEAR FOR EVERYWEAR inherently distinctive for suits and dresses, the TTAB notes the mark's "alliteration," presumably referring to the repeated "w" in the middle of each word (consonance) if not "wear" in its entirety, and perhaps also the echoed vowel sounds that link sp*or*tswear with f*or* to parallel the wear/wear match (assonance).[229] The Board also characterized KRAZY GLAZY, which uses rhyme and assonance, as alliterative,[230] which it is not.

2. Repetition of Words: Anaphora, Epistrophe, & Epizeuxis

The repetition of a word or phrase at the beginning of successive clauses or sentences is called **ANAPHORA** [uh-NAH-for-a]. See, for example, the opening lines of Allen Ginsberg's "America":

> America I've given you all and now I'm nothing.
> America two dollars and twentyseven cents January 17, 1956.
> I can't stand my own mind.
> America when will we end the human war?
> Go fuck yourself with your atom bomb.
> I don't feel good don't bother me.
> I won't write my poem till I'm in my right mind.
> America when will you be angelic?
> When will you take off your clothes?
> When will you look at yourself through the grave?
> When will you be worthy of your million Trotskyites?
> America why are your libraries full of tears?
> America when will you send your eggs to India?
> I'm sick of your insane demands.
> When can I go into the supermarket and buy what I need with my good looks?
> America after all it is you and I who are perfect not the next world.[231]

227. Gale Grp. Inc. v. King City Indus. Co., 23 U.S.P.Q.2D 1208, 1992 WL 163595, at *4 (M.D. Fla. 1992).

228. Perhaps the court meant to highlight the fact that the two marks both begin with the letter P, which makes them at least a little similar. It seems equally plausible that the court's use of the phrase "alliterative sound" here is a stand-in for other similarities in sound and meaning.

229. *In re* David Crystal, Inc., 145 U.S.P.Q. (BNA) 95, 95 (T.T.A.B. 1965).

230. Safe-T Pac. Co. v. Nabisco, Inc., 204 U.S.P.Q. (BNA) 307, 316 (T.T.A.B. 1979).

231. ALLEN GINSBERG, *America*, *in* COLLECTED POEMS, 1947-1980, at 146, 146 (1984).

Anaphora is particularly common in slogans, such as SOMETIMES YOU FEEL LIKE A NUT . . . SOMETIMES YOU DON'T . . . for sister candy bars Mounds and Almond Joy;[232] MAYBE SHE'S BORN WITH IT. MAYBE IT'S MAYBELLINE. for makeup;[233] and DOUBLE YOUR PLEASURE, DOUBLE YOUR FUN for Doublemint gum.[234] Some marks even triple up, like CAKE FOR ME, CAKE FOR YOU, CAKE FOR TWO! for cakes;[235] BETTER CARE BETTER HEALTH BETTER LIFE for diabetes app Glucolyf;[236] or ALL MORNING OR ALL NIGHT. ALL YEAR LONG. for utility services.[237] The vast majority of marks that employ anaphora seem to be treated as both inherently distinctive and unitary, i.e., they are registered without either disclaimer of descriptive terms or any office action alleging mere descriptiveness.[238]

While anaphora is rarely named in litigation, it did come up in an opposition proceeding between luxury watchmaker Rolex and Swatch subsidiary Montres Jaquet Droz SA. Rolex opposed the application to register SOME WATCHES TELL TIME . . . SOME TELL A STORY based on a likelihood of confusion with its alleged common law trademark, IT DOESN'T JUST TELL TIME. IT TELLS HISTORY, both for watches. In its brief, Rolex emphasized the similar structure and meaning of the two marks, arguing:

> [t]here is little doubt that [the marks] are substantially similar in appearance, sound, connotation and commercial impression . . . .

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232. SOMETIMES YOU FEEL LIKE A NUT. . .SOMETIMES YOU DON'T. . ., Registration No. 1,611,447.

233. MAYBE SHE'S BORN WITH IT. MAYBE IT'S MAYBELLINE, Registration No. 1,936,468.

234. DOUBLE YOUR PLEASURE, DOUBLE YOUR FUN, Registration No. 4,795,220; *see also*, *e.g.*, BRING OUT THE HELLMANN'S. . .BRING OUT THE BEST!, Registration No. 1,462,104 (canceled) (for mayonnaise); HAVE A BREAK, HAVE A KIT KAT, Registration No. 5,433,714 (for chocolate bars); KIDS GET SICK. MOMS GET TRIAMINIC, Registration No. 2,958,355 (canceled) (for cough syrup).

235. CAKE FOR ME, CAKE FOR YOU, CAKE FOR TWO!, Registration No. 3,796,944 (canceled).

236. BETTER CARE BETTER HEALTH BETTER LIFE, Registration No. 6,211,640; *see also*, GLUCOLYF BETTER CARE BETTER HEALTH BETTER LIFE, Registration No. 6,211,641 and BETTER CARE. BETTER LIFE. BETTER CHOICE., Registration No. 3,824,967 for the same mark by the same registrant for different goods and services.

237. ALL MORNING OR ALL NIGHT. ALL YEAR LONG., Registration No. 4,501,427 (canceled); *see also*, *e.g.*, NO NEEDLES.NO WAITING.NO KIDDING, Registration No. 3,205,122 (for cosmetics); REAL PEOPLE, REAL BROKERS, REAL ESTATE, Registration No. 6,421,651 (for real estate management services).

238. I draw that conclusion based on review of the filewrappers available at TESS, the USPTO's electronic search site. Occasionally some file components are omitted, especially for older registrations.

> Both marks consist of two phrases with emphasis on identical or virtually identical words appearing in the same place. 'TELL TIME' appears at the end of both marks' first sentence and a similar phrase appears at the end of the second sentence TELLS HISTORY/TELL A STORY. Both marks use a two sentence structure with a similar cadence and are an anaphora . . . thereby making a phrase easier to remember through repetition, which in this case is the repetition of the word TELL.[239]

Rolex goes on to define "anaphora" in its brief[240] and append a Wikipedia definition, driving home the importance of the rhetorical device to the company's argument.[241] The Board, unfortunately, did not address either the mark's distinctiveness or the likelihood of confusion between the two, finding instead that Rolex neither properly pled nor adequately proved priority.[242]

While Anaphora repeats a word at the beginning of each clause, **EPISTROPHE** [eh-PIS-truh-fee] repeats a word at the end of successive clauses or sentences. Consider, for example, the slogan "You're not fully clean unless you're Zestfully clean" for ZEST soap[243] or the Skittles campaign that takes its registered slogan, TASTE THE RAINBOW,[244] and adds other verbs: "Harvest the Rainbow, Taste the Rainbow"; "Mob the Rainbow. Taste the Rainbow."; "Believe the Rainbow, Taste the Rainbow."[245] Epistrophe is visible in registered marks like IT'S A LIFESTYLE, IT'S A LOVESTYLE for dog training services[246] and STEEP IT. SPIKE IT. RUN WITH IT.[247] for beverages, both registered as inherently distinctive without disclaimers.

A cousin to anaphora and epistrophe, **EPIZEUXIS** [eh-pih-ZOOX-is] describes emphatic repetition of a word. In poetry the repeated words may be separated by other words, like the suffering pig in Philip Levine's "Animals are Passing From Our Lives":

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239. Brief on Merits for Plaintiff at 25, Rolex Watch U.S.A., Inc. v. Montres Jaquet Droz SA, No. 91242189, 2020 WL 3272954 (T.T.A.B. June 17, 2020).

240. *Id.*

241. Opposer's Fourth Notice of Reliance at Exhibit D, Rolex Watch U.S.A., Inc. v. Montres Jaquet Droz SA, No. 91242189 (T.T.A.B. Mar. 17, 2020).

242. Rolex Watch U.S.A., Inc., No. 91242189, 2020 WL 7861237, at *11 (T.T.A.B. Dec. 7, 2020).

243. *Top of FormBottom of FormTop of Form Bottom of FormFavorite Commercials From Television and Radio in the Eighties, Products Beginning with Z*, IN THE 80S, http://www.inthe80s.com/tvcommercials/z.shtml [https://perma.cc/93JK-S5PC] (last visited July 26, 2021).

244. TASTE THE RAINBOW, Registration No. 5,073,429.

245. Ivy Decker, *Taste the Rainbow with Skittles: Marketing Campaign Review*, ATA (Apr. 9, 2020), https://blog.anthonythomas.com/ata-blog/taste-the-rainbow-with-skittles-marketing-campaign-review [https://perma.cc/9MQG-4CK5].

246. IT'S A LIFESTYLE, IT'S A LOVESTYLE, Registration No. 5,758,364.

247. STEEP IT. SPIKE IT. RUN WITH IT., Registration No. 6,176,768.

> "In my dreams
> the snouts drool on the marble,
> suffering children, suffering flies,
>
> suffering the consumers
> who won't meet their steady eyes
> for fear they could see."[248]

Or they may be repeated in a string, as in the closing line of Sylvia Plath's "Daddy": "Daddy, daddy, you bastard, I'm through."[249]

Trademarks that employ epizeuxis are easy to come by: think of marks like PIZZA!PIZZA! for restaurant services, PETPET for devices for scratching pets,[250] CANDY'S CANDIES for candy; DUM DUMS and CHUPA CHUPS for lollipops; and ROCK & ROCK for tile.[251] In fact, the owner of the first and likely most famous of these marks, Little Caesar's, owns registrations for that and more than fifteen other marks that employ epizeuxis,[252] from MEATSA!MEATSA![253] to PICNIC!PICNIC![254] The repeated words need not sit back-to-back: trademark phrases like SHOWER TO SHOWER and HOUR AFTER HOUR[255] also qualify.

Experts argue that devices like epizeuxis increase engagement with a slogan[256] or mark. Factfinders vary when they consider the effect of epizeuxis

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248. PHILIP LEVINE, *Animals Are Passing from our Lives*, *in* NOT THIS PIG: POEMS, 79, 79 (1968).

249. SYLVIA PLATH, *Daddy*, *in* COLLECTED POEMS, 222, 224 (1981).

250. Note that the term "pet" plays two roles here—it can be read as a verb follow by a noun, as in "pet [your] pet."

251. *See* CAFFE CAFFE, Registration No. 2,252,077 (canceled) for ready-to-drink coffee; BOOKBOOK, Registration No. 3,846,580 for laptop carrying cases; JOYJOY, Registration No. 4,736,397 (canceled) for watches.

252. *E.g.*, BABY PAN!PAN!, Registration No. 1,594,459; CRAZY!CRAZY! COMBO, Registration No. 2,941,513; EXTRA!EXTRA!, Registration No. 3,678,190; PARTY!PARTY! PACK, Registration No. 1,594,701; PARTY!PARTY!, Registration No. 2,026,218; PEPPERONI!PEPPERONI!, Registration No.:; SLICE!SLICE!, Registration No. 4,344,357 (Supplemental Register); THANK YOU! THANK YOU!, Registration No. 2,348,053; VALUE!VALUE!, Registration No. 2,502,119; VEGGIE!VEGGIE!, Registration No. 1,828,443; PEPPERONI!PEPPERONI!, Registration No. 1,813,907.

253. MEATSA!MEATSA!, Registration No. 1,801,643.

254. PICNIC!PICNIC!, Registration No. 1,757,061. Little Caesar's asserted that its epizeuxis marks constituted a family of marks, but the TTAB did not agree. *In re* Lc Trademarks, Inc., 121 U.S.P.Q.2d 1197, 1204–05 (T.T.A.B. 2016).

255. Johnson & Johnson v. Colgate-Palmolive Co., 345 F. Supp. 1216, 1222 (D.N.J. 1972) (finding no likelihood of confusion between SHOWER TO SHOWER for aerosol deodorant and HOUR AFTER HOUR for talcum powder).

256. Edward F. McQuarrie & David Glen Mick, *Visual Rhetoric in Advertising: Text-Interpretive, Experimental, and Reader-Response Analyses*, 26 J. CONSUMER RSCH. 38–39 (1999).

on a mark's distinctiveness. The TTAB reversed a refusal to register the mark SPORTSWEAR FOR EVERYWEAR for dresses and suits, finding the mark inherently distinctive and noting the double meaning created by the misspelling of "everywhere" to match the "wear" in "sportswear."[257] And the USPTO granted registrations for DUM DUMS for suckers,[258] PETPET for pet scratchers,[259] SHOWER TO SHOWER for talcum powder,[260] and ROCK & ROCK for tile,[261] apparently treating all as inherently distinctive and unitary.[262] On the other hand, Little Caesar's was required to disclaim "pizza" when it registered PIZZA!PIZZA! for pizza[263] and the owner of stylized CANDY'S CANDIES, "candies."[264] The TTAB affirmed refusals to register CAESAR! CAESAR![265] for salad dressing and DJDJ for disc jockey services as merely descriptive, noting in the latter case that the repetition did nothing to elevate the term from descriptive to distinctive:

> We do not believe that DJDJ is rendered any less descriptive by repeating the letters . . . . At best, on seeing DJDJ, it would occur to a viewer that the letters are repeated for emphasis. There is nothing in the composite which changes the meaning of the letters in any manner which would give them a different meaning. If one were to express the view that milk was "creamy creamy" or that a red bicycle was "red red" or that a razor was "sharp sharp," the repetition of the words "creamy," "red" and "sharp" would be understood as emphasis and the combinations of these words would not, simply because of their repetition, be rendered something more than descriptive. Nothing new or different is imparted by the simple repetition of the descriptive expression DJ. Thus, the composite expression is, in our view, equally descriptive as used in connection with the identified services.[266]

257. *In re* David Crystal, Inc., 145 U.S.P.Q. (BNA) 95, 95 (T.T.A.B. 1965).

258. DUM DUMS, Registration No. 4,131,184.

259. PETPET, Registration No. 5,657,506.

260. SHOWER TO SHOWER, Registration No. 0,956,222.

261. ROCK & ROCK, Registration No. 3,251,553.

262. DUM DUMS was registered in 1973, so its filewrapper is not fully digitized. When the same owner registered DUM DUM POPS for candy suckers, it disclaimed "pops." Registration No. 1,184,039.

263. PIZZA!PIZZA!, Registration No. 1,399,730. The USPTO shows no record of descriptiveness refusal, but the PIZZA!PIZZA! registration cites a prior registration for PIZZA PIZZA, which Little Caesar's acquired from a different owner in 1982.

264. CANDY'S CANDIES, Registration No. 5,269,931.

265. *In re* Litehouse Inc., 82 U.S.P.Q.2d 1471, 1474 (T.T.A.B. 2007) (CAESAR! CAESAR! for salad dressing merely descriptive and not unitary).

266. *In re* Disc Jockeys Inc., 23 U.S.P.Q.2d 1715, 1717 (T.T.A.B. 1992); *see also In re* LC Trademarks, Inc., 121 U.S.P.Q.2d 1197, 1197 (T.T.A.B. 2016) (affirming refusal of DEEP!DEEP! DISH PIZZA for pizza); *In re* Tires, Tires, Tires, 94 U.S.P.Q.2d 1153, 1157

In the likelihood of confusion context, epizeuxis may not be enough to render two otherwise similar marks dissimilar. In one case, the Board affirmed the refusal to register TOP-TOP'S for corn chips based on a likelihood of confusion with TOPS for potato chips and crackers. While the owner of TOP-TOPS highlighted the mark's "fanciful . . . alliteration," the Board found the marks "quite similar with each being comprised *only* of variations on the term 'tops.'"[267]

The Second Circuit, reversing a lower court's finding of fair use, differed from the Board in considering the effect of repetition on distinctiveness:

> While "Swing" is descriptive, "Swing Swing Swing" is not necessarily so. The explanation that the word describing the action must be repeated three times to describe the three actors shown hitting golf shots is tenuous when the ordinary term for their action involves the single word "swing," "hit," "stroke," or "shot." Spalding hopes individual consumers will "swing" its irons, presumably after having "bought" them, not "swing swing swing" its irons. The argument that the phrase as a whole describes the genre of music in the soundtrack is patently incorrect, as it is "swing" music, not "swing swing swing" music.[268]

While the posture is admittedly very different in the Second Circuit case, the quoted text suggests different readers might find repetition to play a greater or smaller role in altering meaning depending on the case.

3. Onomatopoeia

A more direct way that trademarks play with sound is by using **ONOMATOPOEIA** [ON-uh-mat-uh-PEE-a]**:** mimicking the sound of an object or action to evoke it. Edgar Allen Poe combines onomatopoeia with devices from the previous section, including alliteration, assonance, epizeuxis, and anaphora, in the first part of "The Bells":

> Hear the sledges with the bells—
> Silver bells!
> What a world of merriment their melody foretells!
> How they tinkle, tinkle, tinkle,

(T.T.A.B. 2009) (TIRES TIRES TIRES generic for retail tire store services); *In re* Jonathan Drew Inc., 97 U.S.P.Q.2d 1640, 1644 (T.T.A.B. 2011) (repetition in KUBA KUBA does not alter its geographic descriptiveness).

267. *In re* Totis of Texas, LLC, No. 85067330, 2012 WL 3875738, at *2–3 (T.T.A.B. Aug. 17, 2012).

268. EMI Catalogue P'ship v. Hill, Holliday, Connors, Cosmopulos Inc., 228 F.3d 56, 65 (2d Cir. 2000) (reversing summary judgment for defendant its use of "swing, swing, swing" in an advertisement for golf clubs constituted a fair use of plaintiff's mark SING SING SING).

> In the icy air of night!
> While the stars that oversprinkle
> All the heavens seem to twinkle
> With a crystalline delight;
> Keeping time, time, time,
> In a sort of Runic rhyme,
> To the tintinnabulation that so musically wells
> From the bells, bells, bells, bells,
> Bells, bells, bells—
> From the jingling and the tinkling of the bells.

Onomatopoeia is a common inspiration for trademarks, whether the sound describes something associated with the product directly—like ACHOOZ for nasal wipes;[269] ZOOM-ZOOM for cars;[270] BAA-BAA-Q'S for dog treats made of lamb;[271] or SLURPEE for frozen beverages[272]—or its intended consumer, like PURR-FECT'[273] for cat litter or MEOW MIX for cat food.[274] The onomatopoeia might also be further removed, as in BZZAGENT for a marketing service designed to generate "buzz"[275] or AHHHH. for winter outerwear meant to offer wearers relief from cold weather.[276] It also features prominently in some memorable advertising slogans, like SNAP! CRACKLE! POP![277] for rice cereal that makes those sounds when submerged in milk, or PLOP PLOP FIZZ FIZZ for Alka Seltzer, which makes those noises when dropped into a glass of water.[278] While all of those marks were ultimately registered as inherently distinctive and without disclaimers, PURR-FECT BLEND for cat food[279] disclaims "blend" and was initially issued an office

269. ACHOOZ, Registration No. 3,848,597.

270. ZOOM-ZOOM, Registration No. 2,749,519.

271. BAA-BAA-Q'S, Registration No. 1,861,440 (canceled).

272. SLURPEE, Registration No. 0,829,177.

273. PURR-FECT, Registration No. 1,028,846.

274. MEOW MIX, Registration No. 1,995,276.

275. *See* Bzzagent, Inc. v. Bzzagen.com C/o Nameview Inc. Whois Identity Shield/ vertical Axis, No. D2010-1188, 2010 WL 4264657, at *4 (URDP-Arb. Sept. 10, 2010) ("The Panel observes that the Complainant's trademark BZZAGENT comprises the onomatopoeia 'bzz' and the descriptive word 'agent.'").

276. U.S. Trademark Application Serial No. 90,511,233 (filed Feb. 4, 2021).

277. SNAP! CRACKLE! POP!, Registration No. 3,222,184; *see also* SNAP CRACKLE POP, Registration Nos. 0,563,358, 1,143,592, 1,659,058, 2,338,123, 4,342,876; SNAP, CRACKLE, POP, Registration No. 1,038,909.

278. Alka Seltzer tablets are meant to be dropped into water (plop, plop) and then bubble (fizz, fizz) before the consumer swallows the whole combination.

279. PURR-FECT BLEND, Registration No. 2,963,941 (canceled), *cited in In re* Midwestern Pet Foods, Inc., No. 78876346, 2009 WL 273246, at *2 (T.T.A.B. Jan. 30, 2009) among examples of mark that "do suggest a dog's growl or a cat's purr by either repeating the

action for mere descriptiveness. The owner overcame the refusal after arguing, among other things, that the "purr" in "PURR-FECT" created a double entendre and thus made the mark more than merely descriptive.[280]

Despite the plethora of onomatopoetic marks, few cases and TTAB decisions actually reference the device itself.[281] When they do, onomatopoeia is sometimes credited with elevating the mark's status, even though describing the sound the products, ingredients, or users make might seem like textbook descriptiveness.[282] Factfinders have deemed GOBBLE-GOBBLE suggestive for turkey meat products[283] and STEAK-UMM suggestive for frozen steak

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'R' several times or combining 'purr' with other elements" (the other examples cited were GRRRAVY, Registration No. 1,486,380 and PURRLICIOUS, Registration No. 2,800,874).

280. Registration No. 2,963,941 Office Action response (Nov. 1, 2004) at 6–7. Applicant also cites other PURR-formative marks including CATS' PURRFERRED; PURRSUASIONS; PURR 'N SIMPLE; PURRFECTLY REMARKABLE; and GEE-PURRS!. *Id.* at 2–3.

281. *But see* Jules Montenier, Inc. v. Ressan Co., 110 U.S.P.Q. (BNA) 60, 61 (Com'r Pat. & Trademarks 1956) (finding no likelihood of confusion between POOF! for anti-perspirant and deodorant products and TOOF for an athlete's foot treatment; acknowledging the onomatopoeia of POOF! for the function of the plastic squeeze bottle); *In re* Midwestern Pet Foods, Inc., No. 78876346, 2009 WL 273246, at *2 (T.T.A.B. 2009) (affirming refusal to register CHED 'R' WEDGES as merely descriptive for pet food and pet treats and dismissing applicant's argument that the 'R' in the mark constituted onomatopoeia, in the form of "'growling sound elements' that may call to mind a growling dog.").

282. The onomatopoeia discussed in this Section is the literal kind, so it should rightfully be treated as descriptive or suggestive when it conjures a widely-recognized sound effect, like "vroom" or "shhh" or "cockadoodledoo" (of course, such widely-recognized onomatopoeia could theoretically also be used as arbitrary marks—VROOM for ice cream or COCKADOODLEDOO for pencils). Marketing and trademark scholars have also explored the broader related topic of sound symbolism, "'the direct linkage between sound and meaning.'" Jake Linford, *Are Trademarks Ever Fanciful?*, 105 GEO. L.J. 731, 734 (2017) (quoting Leanne Hinton, Johanna Nichols & John J. Ohala, *Introduction: Sound-Symbolic Processes*, *in* SOUND SYMBOLISM 1, 1 (Leanne Hinton, Johanna Nichols & John J. Ohala. eds., 1994)). According to Linford, numerous empirical studies across fields have determined that "vowel and consonant sounds convey concepts like big/small, fast/slow, thin/thick, light/heavy, cold/warm, bitter/sweet, more/less friendly, or feminine/masculine, even when the word itself is nonsense. For example, when asked to distinguish two imaginary pieces of furniture, approximately 80% of respondents say the one named Mal is larger than the one named Mil." Linford, *supra*, at 734. In other words, even those letters and syllables that don't constitute onomatopoeia because they don't sound like anything we know still bear consistent connotations for readers, which often factors into producers' choice of trademarks and slogans. "Unlike courts and legal scholars, marketers have been aware of the benefits of sound symbolism for some time now, and they seek competitive advantage by utilizing the communicative and attractive function of sound symbols when coining a fanciful trademark." *Id.* at 750.

283. Louis Rich, Inc. v. Horace W. Longacre, Inc., 423 F. Supp. 1327 (E.D. Pa. 1976).

products.[284] The court said GOBBLE-GOBBLE "describes the sound made by a turkey, but it does not describe turkey meat products . . . The term could suggest any of a variety of products having some connection with a turkey, for example, a turkey itself, or a stuffed or rubber toy in the shape of a turkey, or a device used to imitate the sound of a turkey, or some product made from turkey meat."[285] Likewise, STEAK-UMM is suggestive because "'The word 'Steak' suggests a food product and the word 'Umm' sounds like 'mmm,' a suggestion that the product tastes good. The consumer . . . must draw his own conclusions about the identity of the product." [286] And while a court characterized BOCBOC as likely descriptive for fried chicken,[287] it noted that a reasonable juror could find BOCBOC either descriptive or suggestive.[288]

4. Rhyme

RHYME [rime]**:** when two words match each other in terminal sound, typically including both vowels and consonants. See, for example, Langston Hughes' "Harlem" in its entirety:

> What happens to a dream deferred?
> Does it dry up
> like a raisin in the sun?
> Or fester like a sore—
> And then run?
> Does it stink like rotten meat?
> Or crust and sugar over—
> like a syrupy sweet?
>
> Maybe it just sags
> like a heavy load.

284. Steak Umm Co., LLC v. Steak 'Em Up, Inc., 868 F. Supp. 2d 415, 422–23 (E.D. Pa. 2012).

285. *Louis Rich, Inc.*, 423 F. Supp. at 1337.

286. *Steak Umm Co.*, LLC, 868 F. Supp. 2d at 422–23.

287. BBC Grp. NV LLC v. Island Life Rest. Grp. LLC, 413 F. Supp. 3d 1032, 1043 (W.D. Wash. 2019) ("'BOCBOC' is onomatopoeia for the sound a chicken makes and is therefore descriptive of the product sold—i.e., fried chicken."), *reconsideration denied*, 2019 WL 4917060 (W.D. Wash. Oct. 4, 2019), *and reconsideration denied*, 2019 WL 4991533 (W.D. Wash. Oct. 8, 2019).

288. *BBC Grp.*, 413 F. Supp. 3d at 1047. Based on the Island Life's senior rights in BOK A BOK, the court in that set of cases enjoined BBC's use of BOK BOK "and any variation or derivative of that spelling," but declined to enjoin BBC from "any name that includes the sound a chicken makes, including 'BOC BOC' and BOQ BOQ," as requested. BBC GROUP NV LLC v. Island Life Rest. Grp. LLC, No. C18-1011, 2019 WL 6683510, at *4 (W.D. Wash. Dec. 6, 2019). BBC's CFO had previously inquired whether Island Life "would allow them to use 'Boq Boq Chicken' or 'Boc Boc Chicken.'" BBC Grp. NV LLC v. Island Life Rest. Grp. LLC, 413 F. Supp. 3d 1032, 1039. (W.D. Wash.2019).

Or does it explode?[289]

Examples of rhyming marks abound, from products like MELLO YELLO[290] soda and SHAKE 'N BAKE[291] breading to slogans like L'EGGO MY EGGO[292] for waffles and IT TAKES A LICKING AND KEEPS ON TICKING[293] for watches (all registered as unitary and inherently distinctive). When a trademark possesses internal rhyme—when the mark is or includes a rhyming phrase—that rhyme can shape distinctiveness and unitariness assessments; it can also factor into the analysis of similarity between one mark and another. Two marks in an infringement dispute might rhyme with each other rather than (or in addition to) rhyming internally, leading factfinders in some cases to find the two marks more similar and thus less likely able to coexist without sowing confusion.

Applicants whose marks are refused registration as merely descriptive often emphasize the rhyming nature of the marks but are not always able to persuade the TTAB that the rhyme elevates the mark from descriptive to distinctive. The Board affirmed descriptiveness refusals for BREAK & BAKE for premade cookie dough[294] and BREADSPRED for jellies and jams.[295] The BREAK & BAKE applicant emphasized the mark's consonance and rhyme, but the Board was unpersuaded, noting "[t]hat these two common words contain the 'B' and 'K' sounds and rhyme is of diminished significance when these same words happen to be the best descriptors of the product itself."[296] The Board also affirmed refusal of an ITU application to register CALIFORNIA GREEN CLEAN for cleaning services, holding that the rhyme did not counteract the fact that "green" and "clean" describe the services and "California" describes their geographic origin.[297] On the other hand, it reversed a refusal to register THE UNDERWEAR AFFAIR for charitable fundraising based on mere descriptiveness, pointing out that the rhyming of "underwear" and "affair" "highlight[ed] the fanciful nature of the

289. Langston Hughes, *Harlem*, *in* THE COLLECTED POEMS OF LANGSTON HUGHES 426, 426 (Arnold Rampersad ed., 1995).

290. MELLO YELLO, Registration No. 3,799,512.

291. SHAKE 'N BAKE, Registration No. 1,024,269.

292. L'EGGO MY EGGO, Registration No. 3,419,042.

293. IT TAKES A LICKING AND KEEPS ON TICKING, Registration No. 1,585,550.

294. J & J Snack Foods Corp. v. Nestle USA, Inc., 149 F. Supp. 2d 136, 151 (D.N.J. 2001).

295. *In re* Orleans Wines, Ltd., 196 U.S.P.Q. 516, 517 (T.T.A.B. 1977).

296. J & J Snack Foods Corp. v. Nestle USA, Inc., 149 F. Supp. 2d 136, 151 (D.N.J. 2001).

297. *In re* California Green Clean Dev. Co., LLC, No. 77342688, 2011 WL 1399236, at *3 (T.T.A.B. Mar. 21, 2011). It's worth noting the tremendous number of marks and applications to register marks that include both "clean" and "green."

phrase."[298] Here again, though, TTAB decisions are likely unrepresentative, as many owners of rhyming marks may have successfully persuaded an examining attorney of the marks' distinctiveness at the application phase.

Some mark owners also assert that their marks' internal rhyme renders the marks unitary. In denying a petition to cancel the mark KRAZY GLAZY for toaster pastries, the TTAB deemed it unitary, citing the mark's rhyme in support of that conclusion. [299] In reversing a refusal to register SKINWITHIN,[300] the Board cited that mark's internal rhyme and classified it as unitary too. Likewise, the Board held that the mark SEARS BLUE SERVICE CREW for retail store services was registrable without disclaimer of the descriptive terms "service crew," noting "[c]onsumers will not break the mark SEARS BLUE SERVICE CREW into its component parts but will regard it as a unitary mark, in part, because the mark rhymes."[301] And plenty of rhyming marks containing descriptive terms have been registered without either a showing of acquired distinctiveness or any disclaimer of the descriptive terms, such as CLEAN IT LIKE YOU MEAN IT for pre-moistened towelettes for cleaning;[302] YOU'RE IN LUCK WITH THE BIG ORANGE TRUCK! for HVAC contractor services;[303] TOES ON THE GO for podiatry services;[304] DON'T FEAR THE BEER for beer;[305] WOW NO COW! for non-dairy food products;[306] and LEGAL EAGLES for software related to law practice.[307]

298. *In re* Causeforce, Inc., No. 78625097, 2008 WL 885925 at *3 (T.T.A.B Feb. 15, 2008).

299. Safe-T Pac. Co. v. Nabisco, Inc., 204 U.S.P.Q. (BNA) 307, 316 (T.T.A.B. 1979). The Board also incorrectly cites the mark's "alliteration." *Id.*

300. *In re* Skin Within Servs., Ltd., No. 78122490, 2004 WL 2202266, at *4 (T.T.A.B. Sept. 10, 2004) (reversing refusal to register SKINWITHIN for cosmetics based on likelihood of confusion for WITHIN, also for cosmetics). While the published but non-precedential Westlaw opinion spells the mark as two words, SKIN WITHIN, the file wrapper reveals that the mark is actually SKINWITHIN. *See* SKINWITHIN, Registration No. 2,981,670 (canceled).

301. *In re* Sears Brands, LLC, No. 77558337, 2010 WL 5522986, at *6 (T.T.A.B. Dec. 20, 2010).

302. CLEAN IT LIKE YOU MEAN IT, Registration No. 4,096,244.

303. YOU'RE IN LUCK WITH THE BIG ORANGE TRUCK!, Registration No. 4,695,703 (canceled).

304. TOES ON THE GO, Registration No. 5,316,205.

305. DON'T FEAR THE BEER, Registration No. 4,487,274.

306. WOW NO COW!, Registration No. 5,043,246.

307. LEGAL EAGLES, Registration No. 4,862,107. *But see* LEGAL EAGLES, Registration No. 3,911,159 for directory of lawyers (disclaiming "legal").

But the Board held a number of other rhyming or allegedly rhyming marks were not unitary, including ZOGGS TOGGS for swimsuits and shirts;[308] TAI CHI E for tai chi kits;[309] and VERY BERRY for bird suet cakes with berries. In the case of VERY BERRY, the TTAB held the rhyme did not render the mark so integrated that its components were inseparable: "While the rhyming pattern employed in Applicant's mark may assist consumers' perception of the mark as a combination of both terms rather than just focusing on one, we find no separate distinct overall commercial impression as a result . . . . The two words rhyme, but the rhyming quality imparts no new or different meaning to BERRY apart from its use to describe an ingredient."[310] Many other rhyming marks have been registered only on condition of disclaimer of descriptive terms, including ROSÉ ALL DAY for wine;[311] OODLES OF NOODLES for soup mix;[312] LAFFY TAFFY for candy;[313] LITE BRITE for beer;[314] THE CAR BAR for bartending services;[315] SNACK SHACK for candy and snacks;[316] and BRAIN STRAINS for dietary supplements.[317]

Internal rhyme can also play a role in likelihood of confusion analyses when the TTAB and courts assess the similarity of two different marks. In comparing applicant's mark SKINWITHIN for cosmetics to senior user's mark WITHIN for similar goods and reversing the refusal to register the former, the Board noted, "the fact that SKIN WITHIN rhymes internally also adds a certain phonetic distinction that WITHIN does not have. This rhyming effect also emphasizes the presence of the word SKIN," helping differentiate the two marks.[318] In an older case, the Court of Customs and Patent Appeals (CCPA) affirmed the TTAB's finding that COCO LOCO for coconut flavors sold to soft drink makers, a mark ostensibly selected because it "rhymed" and

308. *In re* Ginc UK Ltd., 90 U.S.P.Q.2d 1472 (T.T.A.B. 2007) (affirming disclaimer requirement of TOGGS in the mark ZOGGS TOGGS and a Section 2(d) refusal based on likely confusion with the registered mark ZOG and design for overlapping goods).

309. *In re* Yongxin Li, No. 87750167, 2019 WL 646097, at *5 (T.T.A.B. Jan. 18, 2019) (affirming refusal to register based on a likelihood of confusion with stylized E mark for fitness-related goods).

310. *In re* Nunn Milling Co., Inc., No. 86596764, 2017 WL 3773111, at *3–4 (T.T.A.B. July 24, 2017).

311. ROSÉ ALL DAY, Registration No. 5,324,810 (disclaiming "rosé").

312. OODLES OF NOODLES, Registration No. 1,068,223 (expired) (disclaiming "noodles").

313. LAFFY TAFFY, Registration No. 1,925,704 (disclaiming "taffy").

314. LITE BRITE, Registration No. 5,459,755 (disclaiming "lite").

315. THE CAR BAR, Registration No. 5,431,314 (disclaiming "bar").

316. SNACK SHACK, Registration No. 4,176,733 (disclaiming "snack").

317. BRAIN STRAINS, Registration No. 6,014,579 (disclaiming "brain").

318. *In re* Skin Within Servs. Ltd., No. 78122490, 2004 WL 2202266, at *4 (T.T.A.B. Sept. 10, 2004).

"seemed to match," did not create a likelihood of confusion with COCA-COLA for soft drinks.[319]

But in a number of other cases involving related goods, factfinders did determine junior users' rhyming marks created a likelihood of confusion with senior users' marks. Examples include MISEL DISEL with DIESEL, both for shaving-related products;[320] LAMMY JAMMYS with LAMIES, both for apparel;[321] VANITY INSANITY with VANITY FAIR, both for clothing;[322] REC TEC GRILLS with TEC, both for grills and accessories;[323] and REVIVE WITH THI with THI, the former for lotion and the latter for cosmetics and false eyelashes.[324]

The greatest proportion of published opinions discussing rhyme assess whether a junior user's mark creates a likelihood of confusion when it rhymes with a senior user's mark, as when Ernest & Julio Gallo, owners of the well-known GALLO brand for wine, sued a foreign applicant that applied to register RALLO for wine in the US.[325] Courts and the TTAB seem more likely to find marks that rhyme with each other[326] to be similar, weighting the overall analysis toward a likelihood of confusion. Examples include GARANIMAL

319. Coca-Cola Co. v. Essential Prod. Co., 421 F.2d 1374, 1375 (C.C.P.A. 1970).

320. Diesel S.p.A. v. Misel Disel, LLC, No. 91225389 (T.T.A.B. Nov. 5, 2018) (not precedential).

321. *In re* Lisa Council Gonzalez, No. 78363598, 2005 WL 2543638, at *2 (T.T.A.B. Sept. 30, 2005) (acknowledging that "applicant's mark does have a lyrical, rhyming, quality to it" but nonetheless finding consumers would perceive "Lammys" as the dominant portion of the mark given the descriptive nature of "Jammys").

322. Vanity Fair, Inc. v. Hainline, No.'s 91163354, 91166973 & 91166975, 2008 WL 853839, at *5–7 (T.T.A.B. Jan. 15, 2008) (sustaining opposition to register VANITY INSANITY, VANITY & SANITY, and VANITY N SANITY).

323. Thermal Eng'g Corp. v. Rec Tec Indus., LLC, No. 91225798, 2019 WL 646100 (T.T.A.B. Jan. 9, 2019) (sustaining opposition to register REC TEC GRILLS in 2 International Classes covering grills and accessories based on a likelihood of confusion with TEC for grills, accessories, and radiant burner units, but dismissing the opposition as to wood pellets).

324. *In re* Daniel T. Phuoc, No. 77356068, 2009 WL 1228530, at *3 (T.T.A.B. Apr. 29, 2009).

325. E. & J. Gallo Winery v. Cantine Rallo, S.p.A., 430 F. Supp. 2d 1064, 1068–71 (E.D. Cal. 2005).

326. In almost every case, the Board or court recites the rule that there is no single "correct" pronunciation of a mark; whether or not all consumers would pronounce the marks in a rhyming way, it's always possible that some would. *See, e.g.*, Chanel, Inc. v. Mauriello, No. 2004, 2010 WL 3873650, at *9 (T.T.A.B. Sept. 20, 2010) ("It is well established that there is no correct pronunciation of a trademark"). *But see* Procter & Gamble Co. v. A. E. Staley Mfg. Co., 342 F.2d 476, 480 (C.C.P.A. 1965) (quoting appellee's brief) ("'[W]hen we say that the trademark 'OXYTROL' is pronounced differently from the mark 'OXYDOL,' it is for a very logical reason and well supported by the evidence in this case.'").

and MANIMAL, both for apparel;[327] LISTERINE and PISSTERINE, both for mouthwash;[328] HUGGIES and DOUGIES, both for disposable diapers;[329] MEGO and LEGO, both for toys and games;[330] ISOCURE and ISOPURE, both for dietary supplements;[331] WING KING and WING-DINGS, both for poultry products; [332] WHOSHERE and WHONEAR, both for social proximity networking applications; [333] ROCKE and JOCKEY, both for hosiery;[334] and IKON and NIKON, both for cameras.[335] The same appears

327. Garan, Inc. v. Manimal, LLC, No. 20-cv-00623, 2022 WL 225060, at *6 (D. Or., Jan. 25, 2022) (reversing TTAB's denial of Plaintiff's opposition to the registration of MANIMALS and ordering registration canceled) ("[T]he fact that the TTAB could articulate some rational explanation for the difference between GARANIMAL and MANIMAL does not vitiate the fact that the marks 'sound much alike and actually rhyme.'").

328. Johnson & Johnson v. Pissterine, LLC, No. 91254670, 2022 WL 190986 at *3–8 (T.T.A.B. Jan. 18, 2022).

329. Kimberly-Clark Corp. v. H. Douglas Enters., 774 F.2d 1144 (Fed. Cir. 1985).

330. Interlego Ag v. Abrams/gentile Ent. Inc., 63 U.S.P.Q.2d 1862 (T.T.A.B. 2002).

331. The Isopure Co. v. Essen Nutrition Corp., No. 86170550, 2016 WL 7385774, at *7 (T.T.A.B. Nov. 23, 2016).

332. Hester Indus., Inc. v. Wing King, Inc., No. 91-CV-2644-RHH, 1992 WL 200129, at *1, *4 (N.D. Ga. Mar. 26, 1992), (granting preliminary injunction based on likelihood of confusion with plaintiff's registered marks WING-DINGS and WING-ZINGS), *aff'd sub nom.* Hester Indus. V. Wing King, 979 F.2d 1539 (11th Cir. 1992).

333. Whoshere, Inc. v. Orun, No. 13-CV-00526, 2014 WL 12767818, at *4–5 (E.D. Va. Sept. 8, 2014) (granting preliminary injunction because of high likelihood of confusion).

334. Coopers, Inc. v. Rocky Mountain Textile, Inc., 180 F. Supp. 230, 232 (D. Colo. 1959) (finding infringement and cancelling registration of ROCKE for hosiery based on likelihood of confusion with JOCKEY for the same goods).

335. Nikon, Inc. v. Ikon Corp., 803 F. Supp. 910, 916–17 (S.D.N.Y. 1992) (noting the marks "rhyme, which increases the association between the words."); *see also In re* Peter Wood, Geoffrey Dean-Smith, and Tasha Mudd, No. 87022288, 2017 WL 5885620, at *6–7 (T.T.A.B. Oct. 25, 2017) (SINFUL ZINFANDEL and ZINFUL for wine); Nokia Corp. v. Somasundaram Ramkumar, No. 91238114, 2020 WL 3250316, at *8 (T.T.A.B. May 22, 2020) (sustaining opposition to register JIOKIA for email services based on likelihood of confusion with NOKIA for electronics); Tisket-A-Tasket Grp. Inc. v. H.S. Craft Mfg. Co., 53 U.S.P.Q.2d 1283, at *2 (S.D. Ind. 1999) (holding FRIGHTSICLE violates an earlier injunction against defendant's use of LIGHTSICLE because it is confusingly similar to LIGHT * CICLES for lights shaped like icicles); Londontown Mfg. Co. v. Cable Raincoat Co., 371 F. Supp. 1114, 1117 (S.D.N.Y. 1974) (SMOG and LONDON FOG for coats); Chanel, Inc. v. Frank Mauriello No. 2004, 2010 WL 3873650, at *9 (T.T.A.B. Sept. 20, 2010) (sustaining opposition to register ENELLE and EE logo for handbags and accessories based on a likelihood of confusion with CHANEL and CC logo for "identical goods"); Tyr Sport, Inc., No. No. 91120414, 2004 WL 474682, at *3–4 (T.T.A.B. Mar. 9, 2004) (sustaining opposition to register ZYR based on likelihood of confusion with TYR, both for sports apparel; noting consumers would likely view both marks as arbitrary letter strings only one letter apart from one another); Rsch. in Motion Ltd. v. Defining Presence Mktg. Grp., Inc., 102 U.S.P.Q.2d 1187, 1198 (T.T.A.B. 2012) ("we find that there is a high degree of similarity between applicants' mark [CRACKBERRY] and opposer's famous mark [BLACKBERRY]."); Russell Chem. Co. v. Wyandotte Chem. Corp., 143 U.S.P.Q. 252 (C.C.P.A. 1964) (SENTOL and SEN-TROL);

true when defendant's mark rhymes both internally and with plaintiff's mark, as when courts found a likelihood of confusion between LOLLY JOLLY for candy and HOLLY JOLLY for fruit-based snacks[336] and between MISTER TWISTER and WEST SISTER TWISTER, both for fishing lures.[337] In the former case, the Board noted the role of rhyme in the similarity assessment: "we find the overall commercial impressions of the two marks are substantially similar because the difference in meaning of the first word in the parties' marks is overshadowed by the visual and phonetic similarities, particularly the similar rhyming qualities of two words within each of the respective marks."[338]

Given the similarity of goods in so many of these rhyming cases,[339] courts may chalk up the junior user's choice of rhyming mark to bad faith. The court comparing LONDON FOG to SMOG, for example, points out "the question still remains why the defendant should go to such lengths to vindicate its right to 'Smog' if it is simply another word like 'Smug' and is not an attempt to trade on the plaintiff's good will."[340] Likewise, when the owner of SPOTIFY for music streaming services opposed registration of POTIFY for software and location services related to medical marijuana, alleging likelihood of confusion and dilution, the Board refused to believe that the rhyme was a coincidence, instead concluding that the applicant intended to create an association between the two marks.[341]

Atlas Supply Co. v. The Dayton Rubber Co., 125 U.S.P.Q (BNA) 529 (T.T.A.B. 1960) (PLYCRON and NYCRON).

336. St. Nicholas Music Inc. v. Lolly-Jolly, Inc., No. 91155371, 2005 WL 2093243 (T.T.A.B. Aug. 24, 2005) (Section 2(d) opposition to registration of the mark LOLLY-JOLLY for candy).

337. Mister Twister, Inc. v. JenEm Corp., 710 F. Supp. 202, 204 (S.D. Ohio 1989) (enjoining defendants' use of WEST SISTER TWISTER).

338. *St. Nicholas Music*, 2005 WL 2093243, at *3 (T.T.A.B. Aug. 24, 2005).

339. "[W]hen marks appear on identical goods . . . the degree of similarity between the marks necessary to support a finding of likely confusion declines." Cards Against Humanity, LLC v. Vampire Squid Cards, LLC, No. 91225576, 2019 WL 1491525, at *10 (T.T.A.B. Feb. 28, 2019) (citing Cai v. Diamond Hong, Inc., 901 F.3d 1367, 127 U.S.P.Q.2d. 1797, 1801 (Fed. Cir. 2018); Century 21 Real Estate v. Century Life, 970 F.2d 874 (Fed. Cir. 1992).).

340. Londontown Mfg. Co. v. Cable Raincoat Co., 371 F. Supp. 1114, 1118 (S.D.N.Y. 1974).

341. Spotify AB v. US Software Inc., Nos. 91243297 and 91248487, 2022 WL 110251, at *34 (T.T.A.B. Jan. 10, 2022) ("Applicant represents that its decision to adopt the POTIFY mark had nothing to do with . . . the SPOTIFY mark. This is hard to believe . . . . It defies logic and common sense."). Having concluded that POTIFY would dilute SPOTIFY by blurring, the Board did not conduct a likelihood of confusion analysis. *Id.* at 37 n.19. *But see* Johnson & Johnson v. Pissterine, LLC, No. 91254670, 2022 WL 190986, at *21 (T.T.A.B. Jan. 18, 2022) ("[W]e do not find that Applicant's intent to create a parody with its PISSTERINE mark, by itself, evidences an intention to trade on the goodwill of Opposer's LISTERINE mark(s) [that constitutes bad faith].").

Of course, some infringement cases regarding marks that rhyme with each other may still result in a finding of no likelihood of confusion. (As Potify's lawyer points out, Spotify successfully enjoined the use of POTIFY even while CLOTIFY, PLOTIFY, VOTIFY, and NOTIFY remain registered without objection.)[342] In a case asserting that Johnson & Johnson's use of EASY SLIDE for dental floss would create a likelihood of confusion with senior user Gore's mark GLIDE for dental floss, Gore contended the fact that the marks not only rhymed and covered identical goods, their key terms were also synonyms, rendering them "virtually identical." But Johnson & Johnson emphasized the extra word "easy" and its dominant use of its company name as features that distinguished the two marks, and the court found no likelihood of success on the merits.[343] Likewise, one court held OXYTROL for industrial starches did not create a likelihood of confusion with OXYDOL for cleansers and detergent;[344] another found defendant's mark HOUR AFTER HOUR for aerosol deodorant would not create a likelihood of confusion with plaintiff's mark SHOWER TO SHOWER for body powder despite their rhyming nature and related uses.[345]

Meanwhile, defendants asserting parody defenses in infringement or dilution cases that involve rhyming marks—BAD SPANIELS for JACK DANIELS;[346] CHEWY VUITON for LOUIS VUITTON;[347] TIMMY HOLEDIGGER for TOMMY HILFIGER;[348] PETLEY FLEA HOUSE for TETLEY TEA HOUSE[349]—are more likely to find the rhyme works in their favor. The rhyme is often construed to help meet the definition of parody the Fourth Circuit described: "While a parody intentionally creates an association

342. Hailey Konnath, *Spotify Prevails Over 'Potify' Weed Software At TTAB*, LAW360 (Jan. 11, 2022), https://www.law360.com/articles/1454472/spotify-prevails-over-potify-weed-software-at-ttab?copied=1Law360.

343. W.L. Gore & Assocs. v. Johnson & Johnson, 882 F. Supp. 1454, 1458 (D. Del. 1995), *aff'd sub nom.* W.L. Gore & Assocs., Inc. v. Johnson & Johnson, Inc., 77 F.3d 465 (3d Cir. 1996).

344. Procter & Gamble Co. v. A. E. Staley Mfg. Co., 342 F.2d 476, 479–80 (C.C.P.A. 1965).

345. Johnson & Johnson v. Colgate-Palmolive Co., 345 F. Supp. 1216, 1222 (D.N.J. 1972).

346. VIP Prod. LLC v. Jack Daniel's Properties, Inc., 953 F.3d 1170 (9th Cir. 2020).

347. Louis Vuitton Malletier S.A. v. Haute Diggity Dog, LLC, 507 F.3d 252 (4th Cir. 2007).

348. Tommy Hilfiger Licensing, Inc. v. Nat. Labs, LLC, 221 F. Supp. 2d 410 (S.D.N.Y. 2002).

349. Tetley, Inc. v. Topps Chewing Gum, Inc., 556 F. Supp. 785, 794 (E.D.N.Y. 1983) (denying preliminary injunction and finding no likelihood of success on infringement and dilution claims where defendant's use was on collectable stickers sold in "wacky packs" with other stickers, all of which "satirically depict the retail packages of various mass-marketed commercial products.").

with the famous mark in order to be a parody, it also intentionally communicates, if it is successful, that it is not the famous mark, but rather a satire of the famous mark."[350] In cases where the parodic mark is itself being used as a trademark,[351] though, the rhyme won't save it—see, for example, CRACKBERRY for BLACKBERRY;[352] THIS MOLD HOUSE for THIS OLD HOUSE;[353] THE HOUSE THAT JUICE BUILT for THE HOUSE THAT RUTH BUILT;[354] PISSTERINE for LISTERINE;[355] and the barely-rhyming CRABS ADJUST HUMIDITY for CARDS AGAINST HUMANITY,[356] all ultimately refused registration based on their similarity to an opposer's prior mark.[357] As the applicant in the latter case acknowledged, it chose CRABS ADJUST HUMIDITY as the name of its expansion pack designed to complement CARDS AGAINST HUMANITY for a reason: "By Applicant's own admission, this similarity is no coincidence as one of the factors going into Applicant's thought process in adopting its mark was that the mark 'would evoke [Opposer's mark] by rhyming with it.'"[358]

As with many other devices discussed, mark owners and factfinders have been known to identify rhyme where it doesn't seem to exist or deny it where it does. In urging its case that TOBY'S TURKEY DINNER qualified as

350. *Louis Vuitton Malletier S.A.*, 507 F.3d at 267.

351. While parody is explicitly included as a defense to a claim of dilution under a statutory "fair use" exclusion in Section 43(c) of the Lanham Act, 15 U.S.C. § 1125(c)(3)(A), the statute makes explicit that the safe harbor includes only terms used "other than as a designation of source for the person's own goods or services." Since the four cases listed here address marks for which their owners sought application, they clearly involve words and phrases used as source designators, precluding them from the safe harbor.

352. Rsch. in Motion Ltd. v. Defining Presence Mktg. Grp., Inc., 102 U.S.P.Q.2d 1187, 1200 (T.T.A.B. 2012) (sustaining three oppositions to register CRACKBERRY on the basis of likelihood of confusion and all four oppositions on the basis of dilution).

353. This Old House Ventures, Inc. v. Restoration Servs., Inc., No. 91152820, 2005 WL 1822545, at *7 (T.T.A.B. July 25, 2005) (sustaining opposition to register THIS MOLD HOUSE for educational services in the field of mold remediation training based on likelihood of confusion with THIS OLD HOUSE for a wide variety of educational and entertainment services related to home improvement and design).

354. New York Yankees P'ship v. Iet Prod. & Servs., Inc., 114 U.S.P.Q.2d 1497 (T.T.A.B. May 8, 2015).

355. Johnson & Johnson v. Pissterine, LLC, No. 91254670, 2022 WL 190986 (T.T.A.B. Jan. 18, 2022).

356. Cards Against Humanity, LLC v. Vampire Squid Cards, LLC, No. 91225576, 2019 WL 1491525 (Feb. 28, 2019).

357. *But see* Ringling Bros.-Barnum & Bailey Combined Shows, Inc. v. Utah Div. of Travel Dev., 955 F. Supp. 605, 622 (E.D. Va. 1997) (finding Utah's tourism slogan THE GREATEST SNOW ON EARTH did not dilute the Circus' famous mark THE GREATEST SHOW ON EARTH despite rhyming with it), *aff'd*, 170 F.3d 449 (4th Cir. 1999).

358. Cards Against Humanity, LLC v. Vampire Squid Cards, LLC, No. 91225576, 2019 WL 1491525, at *11 (T.T.A.B. Feb. 28, 2019).

unitary, the applicant relied on what it called "the rhyming of 'TOBY' and 'TURKEY'" to support its case; while the closing vowel sounds are the same, most would not consider those two words to rhyme.[359] In the case of SNAP SIMPLY SAFER, the Board described the rhetorical device in play as rhyme, not alliteration.[360] And the Board denied the existence of the rhyme in REVIVE WITH THI, stating "We do not agree with applicant that there is any rhyme or internal rhythm to the mark as a whole that is likely to be perceived by prospective purchasers."[361]

The devices discussed in the "sound" section, including alliteration, assonance, consonance, anaphora, epistrophe, epizeuxis, onomatopoeia, and rhyme, illustrate some of the many ways producers choose or design marks to catch consumers' ears. Marks that use devices in this category seem particularly likely to trip up factfinders and litigants in their articulation of what makes marks more or less distinctive, unitary, or similar. And they can and should play a role in USPTO and judicial determinations about marks.

C. MEANING

1. Adynaton

ADYNATON [a-DIN-a-tin] is the use of hyperbolic metaphor suggesting something impossible. See, for example, poet W.H. Auden:

> 'I'll love you, dear, I'll love you
> Till China and Africa meet,
> And the river jumps over the mountain
> And the salmon sing in the street,
>
> 'I'll love you till the ocean
> Is folded and hung up to dry
> And the seven stars go squawking
> Like geese about the sky.[362]

359. *In re* Midwestern Pet Foods, Inc., No. 85501978, 2013 WL 5498166, at *4 (T.T.A.B. Sept. 26, 2013) (affirming refusal to register TOBY'S TURKEY DINNER without disclaimer of "turkey" and the alliterative PEPPER'S POT ROAST without disclaimer of "pot roast").

360. DuoProSS Meditech Corp. v. Inviro Med. Devices, Ltd., 695 F.3d 1247, 1255 (Fed. Cir. 2012) ("[T]he combination of the terms SIMPLY and SAFER creates a rhyming pattern that results in a distinctive impression separable from the word 'Snap'") (internal citation omitted).

361. *In re* Phuoc, No. 77356068, 2009 WL 1228530, at *3 (T.T.A.B. Apr. 29, 2009).

362. W.H. AUDEN, *As I Walked Out One Evening, reprinted in* COLLECTED POEMS (Edward Mendelson ed., 1976).

Trademark examples include registrations of WHEN PIGS FLY for bread, jam, dog training services, and more;[363] IMPOSSIBLE BURGER for vegetarian meat products designed to taste like real meat;[364] HELL FREEZES OVER for entertainment services;[365] 12TH OF NEVER for beer;[366] MONSTER MILK for a muscle-building beverage;[367] and 600 MILLION YEARS YOUNG for skin care products.[368] Each of those marks appears to have been registered as inherently distinctive, and the USPTO only required a disclaimer for one term among them—the "burger" in IMPOSSIBLE BURGER. Trademark law treats superlative components of marks, like TASTY for ice cream or BEST for beer, as merely descriptive and incapable of protection without a showing of secondary meaning. But marks that employ adynaton evoke the more subtle superlative state of goods or services that are so excellent or so elusive that they are nigh well impossible. Factfinders rarely[369] discuss marks' employment of this device explicitly, but it stands to reason that marks that employ adynaton are more likely to be found inherently distinctive,[370] as these were, and many will likely be deemed unitary as well.[371]

363. WHEN PIGS FLY, Registration No. 6,002,443 (for bakery products) (apparently registered as inherently distinctive); WHEN PIGS FLY, Registration No. 3,523,461 (for jams and jellies); WHEN PIGS FLY, Registration No. 3,523,460 (for retail store services featuring bakery products) (apparently registered as inherently distinctive); WHEN PIGS FLY DOG TRAINING, Registration No. 4,070,260 (for "Educational services, namely, training dogs and providing instruction to people on how to train dogs; conducting dog shows and dog trials," registered as inherently distinctive, but disclaiming "dog training"); *see also* FLYING PIG, Registration No. 5,970,846 (for furniture and transportation logistics services) (apparently registered as inherently distinctive); FLYING PIG, Registration No. 5,226,315 (for cages, bathtubs, sinks, and hair dryers, all for pets) (apparently registered as inherently distinctive); FLYING PIG, Registration No. 4,470,492 (for beer) (apparently registered as inherently distinctive); THREE PIGS FLYING, Registration No. 6,265,066 (for plastic food storage bags).

364. IMPOSSIBLE BURGER, Registration No. 6,211,591 (disclaiming burger).

365. HELL FREEZES OVER, Registration No. 5,761,992.

366. 12TH OF NEVER, Registration No. 5,106,686.

367. MONSTER MILK, Registration No. 3,971,667.

368. 600 MILLION YEARS YOUNG, Registration No. 3,711,062.

369. A Westlaw search finds no record of "adynaton" in any trademark-related decisions.

370. *See*, *e.g.*, Cobra Cap. LLC v. LaSalle Bank Corp., 455 F. Supp. 2d 815, 821 (N.D. Ill. 2006) (denying defendant's motion for summary judgment based on lack of protectability of plaintiff's mark MAKING IMPOSSIBLE POSSIBLE for baking services and noting "[t]he mark at issue here does not appear to be descriptive of the banking or lease financing industry.").

371. *See* TMEP § 1213.05(b) ("A phrase qualifies as unitary in the trademark sense only if the whole is something more than the sum of its parts.") (quoting *ex parte* Mooresville Mills, Inc., 102 U.S.P.Q. 440, 441 (Comm'r Pats. 1954) (a unitary phrase "will have 'some degree of ingenuity in its phraseology as used in connection with the goods; or [say] something a little different from what might be expected to be said about the product; or [say] an expected thing

Similarity analyses of marks that use adynaton, meanwhile, are difficult to come by. As with paronomasia, we might expect that a pair of marks employing the same idea—like WHEN PIGS FLY and NOT UNTIL PIGS FLY—might lead factfinders toward a finding of similarity. While trademarks in this category may blend in with other well-known and lesser-known expressions and catchphrases of various kinds, they build on a rich literary tradition by evoking a counterfactual state that theoretically cannot be achieved.

2. Allusion

ALLUSION [ah-LOO-zhin] is a reference to a well-known literary or musical work, story, concept, person, or thing. Randall Jarrell checks a number of those boxes in the first three stanzas of "The Player Piano," rooting the poem and its characters in their shared spaces, sounds, and cultural iconography:

> I ate pancakes one night in a Pancake House
> Run by a lady my age. She was gay.
> When I told her that I came from Pasadena
> She laughed and said, "I lived in Pasadena
> When Fatty Arbuckle drove the El Molino bus."
>
> I felt that I had met someone from home.
> No, not Pasadena, Fatty Arbuckle.
> Who's that? Oh, something that we had in common
> Like—like—the false armistice. Piano rolls.
> She told me her house was the first Pancake House
>
> East of the Mississippi, and I showed her
> A picture of my grandson. Going home—
> Home to the hotel—I began to hum,
> "Smile a while, I bid you sad adieu,
> When the clouds roll back I'll come to you."[372]

Allusion is a rhetorical device that evokes the reader's cultural knowledge, and it's economical—it can bring to mind a shared touchpoint in just a word or two. Those qualities make it a perfect fit for trademarks, which endeavor to do a lot of work in a small space while simultaneously situating themselves

in an unexpected way.'")); *Id.* § 1213.05(b)(i) ("A slogan is a type of phrase and is defined as 'a brief attention-getting phrase used in advertising or promotion' and 'a catch phrase used to advertise a product.' [S]logans, by their attention-getting nature, are treated as unitary matter and must not be broken up for purposes of requiring a disclaimer.") (citations omitted).

372. Randall Jarrell, *The Player Piano*, *in* THE MADE THING: AN ANTHOLOGY OF CONTEMPORARY SOUTHERN POETRY 124 (Leon Stokesbury ed. 1987).

within popular culture.[373] Perhaps the most-cited example is SUGAR 'N SPICE for baking goods, a reference to a well-known rhyme about the social construction of gender.[374] In another case from the same era, POLY PITCHER was held to allude to then-well-known character Molly Pitcher.[375] The owners of ASK JEEVES![376] named their search engine after a resourceful butler in the stories of P.G. Wodehouse. SHAKE SCATTER & GROW is a trademark for flower seeds that alludes to the Elvis song "Shake, Rattle & Roll."[377] Athletic apparel manufacturer TYR is named for a deity in Nordic mythology.[378] ROBINHOOD for financial services endows the finance app with the attributes of the famous figure.[379] Uncle Sam marks are extremely popular, pairing the patriotic human image with products as diverse as beer, clothing, engine oils, bail bond services, furniture, hunting gear, insurance, and insulation.[380] And the trademark ASICS for sneakers is both allusion and acronym—in standing for "anima sana in corpore sano," Latin for "a healthy

373. Courts and the USPTO also sometimes use the term "allusion" broadly to refer to any kind of suggestive term, in that a suggestive mark links the goods or services to a concept. N. Am. Graphics, Inc. v. N. Am. Graphics of U.S., Inc., No. 97-CIV-3448, 1997 WL 316599, at *3 (S.D.N.Y. June 10, 1997) ("A suggestive mark indirectly or metaphorically alludes to the nature of the product") (quotation and citation omitted). According to one district court, allusion is a factor to consider in assessing whether a mark is suggestive or merely descriptive: it affects "the likelihood that the mark will conjure up other purely arbitrary connotations separate from what the mark conveys about the product." J & J Snack Foods Corp. v. Nestle USA, Inc., 149 F. Supp. 2d 136, 147 (D.N.J. 2001). In that case, the court held, "no such likelihood exists—unlike the pleasant association with the old nursery rhyme that arose from the use of the mark 'Sugar & Spice.'" *Id.*; *see also* AOP Ventures, Inc. v. Steam Distrib., LLC, No. EDCV-151586-VAPKKX, 2016 WL 7336730, at *7 (C.D. Cal. Oct. 11, 2016) (plaintiff's and defendant's MILKMAN marks for electronic cigarette liquid "serve as allusions to the products' milk-like flavor."), *order vacated on reconsideration*, 2016 WL 10586307 (C.D. Cal. Dec. 27, 2016).

374. Application of Colonial Stores, Inc., 394 F.2d 549, 552–53 (C.C.P.A. 1968) ("The immediate impression evoked by the mark may well be to stimulate an association of 'sugar and spice' with 'everything nice.' As such, on the record below, the mark, along with the favorable suggestion which it may evoke, seems to us clearly to function in the trademark sense and not as a term merely descriptive of goods.")

375. Blisscraft of Hollywood v. United Plastics Co., 294 F.2d 694, 700 (2d Cir. 1961).

376. ASK JEEVES!, Registration No. 2,275,474 (canceled); *see also* ASK JEEVES, Registration No. 2,385,161 (also canceled).

377. *In re* White Swan Ltd., 8 U.S.P.Q.2d 1534 (T.T.A.B. 1988) (affirming refusal to register SHAKE SCATTER & GROW for flower seeds based on likelihood of confusion with SHAKE-N-GROW for grass seeds).

378. Tyr Sport, Inc. v. Datanation, LLC, No. 91120414, 2004 WL 474682, at *3 (T.T.A.B. Mar. 9, 2004).

379. ROBINHOOD, Registration No. 4,761,666.

380. *In re* Uncle Sam GmbH, No. 79187215, 2019 WL 4034453, at *1–3 (T.T.A.B. July 31, 2019).

mind in a healthy body," its allusion to the famous phrase is recognizable only to those who are in on the secret of the mark's origin.

ASK JEEVES!,[381] SHAKE SCATTER & GROW,[382] ASICS,[383] TYR,[384] and ROBINHOOD[385] were registered as inherently distinctive, with no disclaimer required. POLY PITCHER was initially deemed descriptive, as "poly" refers to polyethylene, but the Second Circuit reversed that finding, holding the mark inherently distinctive in part because of its allusion to the character.[386] Likewise, the USPTO refused registration of SUGAR 'N SPICE for baking goods as merely descriptive and the Board affirmed, but the CCPA reversed their decision. In so doing, it acknowledged that both terms were descriptive or generic for baking ingredients, but due to the mark's allusion to the well-known nursery rhyme, "[t]he immediate impression evoked by the mark may well be to stimulate an association of 'sugar and spice' with 'everything nice.' As such . . . the mark, along with the favorable suggestion which it may evoke, seems to us clearly to function in the trademark sense and not as a term merely descriptive of goods."[387]

Few infringement cases explicitly discuss allusive marks. In a dispute between the owners of FIRST FRANKLIN and FRANKLIN FIRST, both for financial services, the defendant highlighted the crowded field of marks incorporating the word "Franklin" for banking or financial services, many of which also used "depictions of Benjamin Franklin to evoke an impression of being financially prudent," as did the defendant.[388] The court acknowledged that the allusion was a common one, finding both the plaintiff's mark strength and defendant's bad faith factors neutral in part for that reason and ultimately denying the injunction.[389]

381. ASK JEEVES!, Registration No. 2,275,474 (canceled); *see also* ASK JEEVES, Registration No. 2,385,161.

382. SHAKE SCATTER & GROW, Registration No. 1,770,315 (canceled).

383. ASICS, Registration No. 3,305,197.

384. TYR, Registration No. 1,458,467.

385. ROBINHOOD, Registration No. 4,761,666.

386. Blisscraft of Hollywood v. United Plastics Co., 294 F.2d 694, 700 (2d Cir. 1961).

387. Application of Colonial Stores, Inc., 394 F.2d 549, 552–53 (C.C.P.A. 1968).

388. First Franklin Fin. Corp. v. Franklin First Fin., Ltd., 356 F. Supp. 2d 1048, 1053 (N.D. Cal. 2005) (plaintiff's evidence insufficient to establish that FIRST FRANKLIN "is either inherently distinctive or ha[s] acquired sufficient secondary meaning to be considered strong.").

389. *Id.* at 1054.

3. Anthimeria

ANTHIMERIA [an-thi-MER-ee-ah] refers to the practice of using words as different parts of speech, such as a noun for a verb.[390] Writers do this often, using the incongruity to render familiar words new, as in Shakespeare's "the thunder would not *peace* at my bidding [emphasis added]."[391]

Anthimeria shows up in trademarks[392] like IT'S WHAT HAPPY TASTES LIKE for ice cream and restaurant services;[393] RETHINK POSSIBLE for telephone services;[394] and THINK DIFFERENT for computers.[395] All three appear to have been registered as inherently distinctive, without disclaimers.

There are no published infringement decisions that use the word anthimeria. Factfinders and mark owners don't use the term anthimeria in assessing distinctiveness either, but the idea occasionally comes into play in their analyses. In challenging the USPTO's refusal to register SOLID SELECT for processed timber products and lumber, the applicant acknowledged that "select" has a well-known meaning in the trade: it's a grade used by the National Hardwood Lumber Association to designate boards that measure at least 4"x6" with at least 83% usable material or a high-quality piece of lumber.[396] But the applicant went on to argue that the term "select" could alternatively be understood by consumers to mean "selection"—consumers could interpret the mark as suggesting "a sound purchasing decision."[397] With that argument, the applicant creates (or hopes to create) some ambiguity as to whether "select" is functioning as an adjective, noun, or verb. Mark owners who claim incongruity may be employing anthimeria. And when the TMEP offers WHERE SNACKS LOVE TO DIP! for dips as an example of a unitary mark, anthimeria seems to be doing some work.[398]

390. Ben Yagoda, *Parts of Speech*, N.Y. TIMES (July 9, 2006), https://www.nytimes.com/2006/07/09/magazine/09wwln_safire.html [https://perma.cc/K6AW-NSW7].

391. WILLIAM SHAKESPEARE, KING LEAR act 4, sc. 6, l. 101.

392. While it is a truism that a trademark should always be used as an adjective to maintain protection, Laura Heymann points out that anthimeria "dates back at least as far as Shakespeare" and trademarks are often used as nouns and even as verbs, usually without threatening their source-indicating ability. Laura A. Heymann, *The Grammar of Trademarks*, 14 LEWIS & CLARK L. REV. 1313, 1344 (2010).

393. IT'S WHAT HAPPY TASTES LIKE, Registration No. 2,895,682; IT'S WHAT HAPPY TASTES LIKE, Registration No. 3,011,145.

394. RETHINK POSSIBLE, Registration No. 3,865,791 (canceled).

395. THINK DIFFERENT, Registration No. 3,803,176.

396. *In re* Tenon Ltd., No. 86218698, 2015 WL 8966269, at *2 (T.T.A.B. Nov. 23, 2015).

397. *Id.* at *4.

398. TMEP § 1213.05(b)(ii)(C).

4. Paronomasia

PARONOMASIA [par-ah-no-MAY-zee-uh] is a Greek term for a play on words. It exploits the confusion or double meaning created when words have similar sounds but different meanings, including but not limited to homophones, homonyms, and visual puns.[399]

The pun, often called a "double entendre" in the trademark context, is one of the most commonly used poetic devices in trademark law and perhaps the one most likely to affect outcomes.[400] Where factfinders see wordplay in a mark, they often conclude that the mark is suggestive rather than merely descriptive;[401] it can also lead the USPTO to characterize the mark as unitary.[402] The use of paronomasia can affect likelihood of confusion analyses in a variety of ways.

The TTAB has often found marks to be inherently distinctive rather than merely descriptive based on their wordplay:[403] SHEER ELEGANCE for pantyhose;[404] NAPSACK for a baby carrier with straps;[405] MUFFUNS for mini-muffins;[406] and L'EGGS for pantyhose sold in egg-shaped containers[407]

399. *See* Derek Attridge, *Unpacking the Portmanteau, or Who's Afraid of Finnegan's Wake*, ON PUNS: THE FOUNDATION OF LETTERS, 140–155 (1988) ("The pun is the product of a context deliberately constructed to *enforce* an ambiguity, to render impossible the choice between meanings, to leave the reader or hearer endlessly oscillating in semantic space.").

400. While applicants often point to double entendre to support arguments that a mark is distinctive and unitary, it may also increase the likelihood of a failure to function refusal. *See, e.g.*, LTTB LLC v. Redbubble, Inc., 840 F. App'x 148, 152 (9th Cir. 2021).

401. Roberts, *supra* note 26, at 1062–63; 3 LOUIS ALTMAN & MALLA POLLACK, CALLMANN ON UNFAIR COMPETITION, TRADEMARKS, AND MONOPOLIES § 18:15 n.13 (4th ed. 2011); TMEP § 1213.05(c) ("[A] mark that comprises [a] 'double entendre' will not be refused registration as merely descriptive if one of its meanings is not merely descriptive in relation to the goods or services."). *See, e.g.*, *In re* Computer Bus. Sys. Grp., 229 U.S.P.Q. 859 (T.T.A.B. 1985).

402. TMEP § 1213.05(c) ("A true 'double entendre' is unitary by definition. An expression that is a 'double entendre' should not be broken up for purposes of requiring a disclaimer.").

403. Paronomasia may also support a finding that a mark is not generic, but at least descriptive. *See, e.g.*, Benzicron v. Ledesma, No. 2:13-cv-04537, 2014 WL 4060257, at *5 (C.D. Cal. Aug. 11, 2014) ("[T]he name 'The Sweat Shoppe' is a double entendre, punning off the normal definition of sweatshop together with exercised-induced perspiration. As a double entendre, 'The Sweat Shoppe,' is, by definition, not generic because plaintiff is not using the term sweatshop in its ordinary sense.").

404. No Nonsense Fashions, Inc. v. Consol. Foods Corp., 226 U.S.P.Q. 502, 506 (T.T.A.B 1985) ("Sheer Elegance" for pantyhose suggestive because it describes the texture and also suggests the "ultimate in elegance").

405. *In re* Happy Baby Carrier Co., 179 U.S.P.Q. 864 (T.T.A.B. 1973).

406. *In re* Grand Metro. Foodserv. Inc., 30 U.S.P.Q.2d 1974, 1975 (T.T.A.B. 1994).

407. Sara Lee Corp. v. Kayser-Roth Corp., 81 F.3d 455, 465 (4th Cir. 1996).

are just a few examples.[408] Federal courts have also been swayed by the use of paronomasia, deeming suggestive CHOICE for a health care plan;[409] OFF THE RECORD for radio and television segments on the music industry;[410] HALLOWINE for a spiced, autumnal wine; [411] HASSELL FREE PLUMBING for the services of a plumber named Hassell;[412] and POLY PITCHER for a pitcher made of polyethylene. [413] Of course, the double entendre argument fails perhaps nearly as often as it succeeds.[414] Reviewing this line of cases might lead a skeptical reader to wonder how often lawyers manufacture from whole cloth double entendres that the trademarks' owners never actually intended or even noticed.[415] In trying to persuade the court that BREAK & BAKE was not merely descriptive for pre-sectioned cookie dough, for example, the mark owner argued "the phrase is also a double entendre, requiring the consumer connect the word 'break' with 'taking a break' and then

408. *See, e.g.*, Henry Siegel Co. v. M&R Int'l Mfg. Co., 4 U.S.P.Q.2d 1154, 1159 (T.T.A.B. 1987) (CHIC for jeans); *In re* Siemens Stromberg-Carlson, No. 75/048,293, 1999 WL 1062812, at *2 (T.T.A.B. Nov. 19, 1999) (FAST FEATURE PLATFORM for software and hardware).

409. Aetna Health Care Sys., Inc. v. Health Care Choice, Inc., No. 84-C-642-E, 1986 WL 84362, at *16 (N.D. Okla. May 15, 1986) (noting CHOICE constituted a double entendre and thus was either inherently distinctive or, in the alternative, had acquired secondary meaning).

410. Westwood One, Inc. v. Natl. Broad. Co., No. CV 82-976, 1982 WL 52140, at *1 (C.D. Cal. Apr. 9, 1982) ("The mark's punning reference to the record industry . . . serves to remove it from the merely descriptive category.").

411. C&N Corp. v. Kane, 142 F.Supp.3d 783, 785 (E.D. Wis. 2015).

412. Hassell Free Plumbing, LLC v. Wheeler, 2021 WL 1139424, at *4 (N.D. Tex. Mar. 25, 2021).

413. Blisscraft of Hollywood v. United Plastics Co., 294 F.2d 694, 700 (2d Cir. 1961) (mark qualified as a pun because it was "reminiscent or suggestive of Molly Pitcher of Revolutionary time").

414. *See, e.g.*, *In re* Tenon at *4 (Nov. 23, 2015); *In re* Wells Fargo & Co., 231 U.S.P.Q. 95, 99 (T.T.A.B. 1986) (holding EXPRESSERVICE merely descriptive for banking services, in spite of applicant's assertion that the mark also connotes the Pony Express); *In re* Ethnic Home Lifestyles Corp., 70 U.S.P.Q.2d 1156, 1158 (T.T.A.B. 2003) (holding ETHNIC ACCENTS merely descriptive of "entertainment in the nature of television programs in the field of home décor," in spite of applicant's argument that the pun also suggests a person who speaks with a foreign accent); *In re* the Coleman Co., Inc., No. 85980011, 2013 WL 6664931, at *4–5 (T.T.A.B. Dec. 4, 2013) (THE COOLER COMPANY merely descriptive for coolers in spite of applicant's argument that "cooler" is a "play on the relative hipness of applicant and or applicant's thermal products").

415. *See, e.g.*, *In re* Mayer-Beaton Corp., 223 U.S.P.Q. 1347, 1348 (T.T.A.B. 1984) (arguing unsuccessfully that BIKINEEZ for pantyhose with bikini briefs built in conveys two separate ideas, "bikini" and "ease"); *In re* Somerset Soup Works, Inc., No. 85034559, 2014 WL 1827012, at *4 (T.T.A.B. Apr. 22, 2014) (arguing unsuccessfully that SOUP SINGLES for single-serving soups also conveys that the soup is for single, i.e., unmarried, people).

imagining how pleasant it might be to take a break with this new type of 'BREAK & BAKE' cookie dough."[416]

The TTAB has also found unitariness and declined to require disclaimer where the marks employed paronomasia, as in THE HARD LINE for mattresses and bed springs;[417] DARK OF THE COVENANT for beer;[418] and NO BONES ABOUT IT for fresh pre-cooked ham.[419] In some cases, the presence of pun sufficed for a finding of both unitariness and suggestiveness, as in SUGAR & SPICE for baked goods;[420] THE FARMACY for retail store services featuring dietary supplements;[421] HAY DOLLY for a dolly for transporting hay;[422] and THE SOFT PUNCH for noncarbonated soft drinks.[423] Infringement litigants have also argued that their use of double entendre rendered a mark unitary.[424]

In a number of infringement cases, factfinders have noted that the junior mark's use of pun or parody makes the marks distinguishable and weighs against a likelihood of confusion. The Southern District of New York has opined that "a play on words . . . could dispel consumer confusion that might otherwise arise due to [the] facial similarity" of two marks;[425] it cited the Seventh Circuit in deeming "the ultimate question" in the case at hand "whether the pun was sufficient to dispel confusion among the consuming public."[426] Courts and the TTAB followed this same logic in comparing junior user's FEYONCÈ for apparel with famous musician BEYONCE;[427] TIMMY

416. J & J Snack Foods Corp. v. Nestle USA, Inc., 149 F. Supp. 2d 136, 148 (D.N.J. 2001).

417. *In re* Simmons Co., 189 U.S.P.Q. 352, 353 (T.T.A.B. 1976).

418. *In re* Congregation Ale H. (Azusa Chapter) LLC, No. 85744747, 2014 WL 5281074, at *6–7 (T.T.A.B. 2014).

419. *In re* National Tea Co., 144 U.S.P.Q. 286, 287 (T.T.A.B. 1965).

420. *In re* Colonial Stores Inc., 394 F.2d 549, 552 (C.C.P.A. 1968), *cited in* TMEP § 1213.05(c) (9th ed. Oct. 2013).

421. *In re* Tea and Sympathy, Inc., 88 U.S.P.Q.2d 1062, 1064 (T.T.A.B. 2008), *cited in* TMEP § 1213.05(c) (9th ed. Oct. 2013).

422. *In re* Priefert Mfg. Co., Inc., 222 U.S.P.Q. 731, 733 (T.T.A.B. 1984).

423. *In re* Del. Punch Co., 186 U.S.P.Q. 63, 64 (T.T.A.B. 1975) (mark "possesses a degree of ingenuity in its phraseology which is evident in the double entendre that it projects,"), cited in TMEP § 1213.05(c) (9th ed. Oct. 2013).

424. Todd Christopher Int'l v. Samy Salon Sys., No. 06-CV-2315, 2007 WL 843009, at *3 (M.D. Fla. Mar. 16, 2007) ("The defendants responded that the term FAT HAIR '0' CALORIES should be viewed as a unitary expression, and that '0 CALORIES' in conjunction with 'FAT HAIR' created double entendre and humor because the consumer would view fat in association with calories.").

425. Knowles-Carter v. Feyonce, Inc., 347 F. Supp. 3d 217, 225 (S.D.N.Y. 2018).

426. *Id.* at 226 (citing Nike Inc. v. Just Did It Enters., 6 F.3d 1225, 1228 (7th Cir. 1993)).

427. *Knowles-Carter*, 347 F. Supp. 3d at 221 ("A rational jury might or might not conclude that the pun here is sufficient to dispel any confusion among the purchasing public.").

HOLEDIGGER for pet perfume with TOMMY HILFIGER for human apparel and perfume;[428] NEW YORK $LOT EXCHANGE for casino services with NEW YORK STOCK EXCHANGE for a securities exchange;[429] WORLD BEAT for a music-related news segment with WORLD BEAT for a record label;[430] and DARK OF THE COVENANT for beer with COVENANT for wine,[431] finding that the junior users' readily identifiable puns weighed against a likelihood of confusion. Some but not all of those cases could be described as parody—the junior user's mark takes up and plays on the senior user's widely-recognized mark for comedy or commentary, thereby making it clear that the junior user's mark isn't owned by the senior user. In several other cases, where the junior mark's wordplay was based on reference to the senior user's mark, courts found that reference weighed toward a likelihood of confusion—as in CLOTHES ENCOUNTERS for clothes (too close to CLOSE ENCOUNTERS OF THE THIRD KIND for shirts and CLOSE ENCOUNTERS for perfume);[432] A.2 for steak sauce (playing on the better-known A1 for the same);[433] and THINKER TOY (too similar to TINKERTOY, both for toys).[434]

Factfinders have also compared marks that make the same or different puns as one another. In one case, the TTAB held that use of the same pun contributed to two marks' similarity, upholding an opposition to register AMAIZEING CORN MAZE for corn maze entertainment services based on the opposer's registration for THE AMAZING MAIZE MAZE for the same services.[435] The Board articulated its reasoning as follows:

> [W]e find that the commercial impressions of the two marks are highly similar because the marks employ the same device or pun, i.e., a conflation of the words "maize," "maze" and "amazing." Even though the pun is constructed slightly differently in the two marks, it is the pun itself that purchasers who encounter the two marks at

428. Tommy Hilfiger Licensing, Inc. v. Nat. Labs, LLC, 221 F. Supp. 2d 410, 420 (S.D.N.Y. 2002).

429. N.Y. Stock Exch., Inc. v. N.Y., N.Y. Hotel LLC, 293 F.3d 550, 555 (2d Cir. 2002).

430. Richards v. CNN, Inc., 15 F. Supp. 2d 683, 691 (E.D. Pa. 1998).

431. *In re* Congregation Ale H. (Azusa Chapter) LLC, No. 85744747, 2014 WL 5281074 (T.T.A.B. Sept. 9, 2014).

432. Columbia Pictures Indus., Inc. v. Miller, 211 U.S.P.Q. (BNA) 816, 820 (T.T.A.B. 1981) (affirming refusal to register mark for clothing: "Although the marks have different literal meanings, they conjure up the same thing since one is an obvious play on the other.").

433. Nabisco Brands, Inc. v. Kaye, 760 F. Supp. 25 (D. Conn. 1991).

434. CBS Inc. v. Morrow, 708 F.2d 1579 (Fed. Cir. 1983) (reversing dismissal of opposition).

435. Am. Maze Co. v. Shady Brook Farm, Inc., No. 110278, 2001 WL 403241, at *3 (T.T.A.B. Apr. 19, 2001).

> different times are likely to recall, rather than any slight difference in construction of the pun. The presence of the pun in both marks contributes to the confusing similarity of the marks. For all of these reasons, we find that applicant's mark and opposer's mark, when viewed in their entireties, are similar rather than dissimilar.[436]

A district court in an infringement case between the owner of LETTUCE ENTERTAIN YOU and a related family of "lettuce" marks for catering and restaurant services and a defendant using LETTUCE MIX for a salad bar restaurant relied on similar reasoning, granting a preliminary injunction based in part because both parties used "lettuce" to pun on "let us," a pun that consumers would view as the "salient feature" of both plaintiff's and defendant's marks.[437] Conversely, the TTAB reversed a refusal to register KNOTTY BRUNETTE for beer based on likelihood of confusion with NUTTY BREWNETTE, also for beer.[438] The Board seemed to relish peeling back the layers of wordplay, where "nutty" referenced the flavor of the beer but the phrase is "also a double entendre for 'nutty brunette' to denote a dark-haired female with a 'nutty' or 'silly, strange, or foolish' personality," while "brewnette" also plays on "brew."[439] Meanwhile, "knotty" is a homophone for "naughty," which the Board found "conveys the meaning of 'relating to or suggesting sex in usually a playful way.'"[440] Because "the marks have their own unique humorous play on words that project separate meanings and distinct commercial impressions," confusion was unlikely to ensue.

5. Zeugma

Every alphabetical list of poetic devices seems to end with **ZEUGMA** [zoog-ma]: one word, usually a verb, does double-duty in a phrase, conveying two different meanings at the same time. Oft-cited examples from popular culture include Charles Dickens' "She looked at the object with suspicion and a magnifying glass" and Alanis Morissette's "You held your breath and the door for me." Zeugma is present in trademarks like BREAK HUNGER NOT

436. *Id.*

437. Lettuce Entertain You Enters., Inc. v. Leila Sophia AR, LLC, 703 F. Supp. 2d 777, 785 (N.D. Ill. 2010); *see also* Westwood One, Inc. v. Natl. Broad. Co., No. CV 82-976, 1982 WL 52140, at *2 (C.D. Cal. Apr. 9, 1982) (marks' use of the same pun contributed to their similarity: "[w]hile their literal meanings are opposites, their almost identical puns appear to be a much more important component of their value."); LTTB LLC v. Redbubble, Inc., 840 F. App'x 148, 152 (9th Cir. 2021) (holding plaintiff's uses of its registered trademarks that featured the pun LETTUCE TURNIP THE BEET were functional, not source-identifying.).

438. *In re* Twin Rest. IP LLC, No. 85934428, 2015 WL 4269975 (T.T.A.B. June 24, 2015).

439. *Id.* at *3–4.

440. *Id.* at *4.

PLATES for restaurant services;[441] HOLD BABIES NOT GRUDGES for clothing;[442] and BREAK DANCE NOT HEARTS for clothing.[443] While explicit discussions of zeugma are rare, and none appear in infringement cases, all three of those applications were apparently treated as inherently distinctive and registered without disclaimers.[444]

The devices included in the "meaning" section—adynaton, allusion, anthimeria, paronomasia, zeugma—only scratch the surface when it comes to the many ways that trademarks build on cultural knowledge and generate new associations and goodwill. This section can perhaps be of use to advocates and factfinders as they peel back marks' layers of meaning in order to assess distinctiveness, unitariness, and similarity and make predictions about consumer perception.

IV. CONCLUSION

This Article has compared trademarks to poems, and in so doing it has allowed trademarks to borrow the halo of art. Trademarks and poems are vessels for meaning: the words that comprise them have literal definitions, but readers also bring their own experiences, associations, and worldview to bear on a text.[445] And there can be playfulness,[446] creativity,[447] even joy, in the

441. BREAK HUNGER NOT PLATES, Registration No. 5,857,565.

442. HOLD BABIES NOT GRUDGES, Registration No. 6,271,453.

443. BREAK DANCE NOT HEARTS, Serial No. 78,738,766 (abandoned on Apr. 13, 2009).

444. The intent-to-use-based application for the third mark, BREAK DANCE NOT HEARTS, was abandoned after publication and before registration.

445. Zahr K. Said, *A Transactional Theory of the Reader in Copyright Law*, 102 IOWA L. REV. 605, 626 (2017)("Reader response theories shifted focus from the text to its impact on readers. At a minimum, readers were to be considered equally as important as the texts themselves. In some cases, the readers trumped the text."). Said's theory of the reader in copyright law draws heavily on the work of literary theorist Louise Rosenblatt, for whom "the reader is as important as the text in understanding how the text comes to produce meaning or exist in the world beyond its author." *Id.* at 628.

446. For an example of that playfulness in the advertising context, see the discussion of the Honda ad in Linda M. Scott, *The Bridge from Text to Mind: Adapting Reader-Response Theory to Consumer Research*, 21 J. CONSUMER RSCH. 461, 471 (1994) ("I would argue that people attend to this Honda commercial largely for the fun that they have come to expect from the campaign, and, if they find out there is a big sale on Hondas, so much the better. But if we expect that people attend to the Honda commercials in order to find out pricing information on cars, and the fun of the commercial works only incidentally to form a positive attitude, then we have missed something fundamental about the motives for entering into textual experience.").

447. Laura Heymann describes this sensation in relation to "naming" more generally, whether for a child, a pet, a product, or one's social media handle: "Indeed, the act of naming may feel, to some, as if it involves much the same sort of creative process that, for others,

process and outcome of mark creation or selection. In the words of James Boyd White, "a poetic language . . . works by association and connotation, by allusion and reference, by the way words are put together to make a whole."[448] Our interpretation—of poems, of law, of trademarks—should be "rooted in the sense that meaning is complex, not unitary; that meaning is acquired partly from the language, partly from the text; and that meaning is not restatable in other terms . . . but must be reestablished whenever we talk."[449]

But comparing trademarks to poems is in some ways a false equivalence. A poem is a form of expression, of high art; its creators use poetic devices in service of that art, to make the familiar new and forge genuine connection. Trademarks use devices not in service of art, but of commerce.[450] In that way we might think of trademarks as fallen or debased poetry.

It is perhaps ironic, then, that the process by which factfinders consider poetic devices in trademark analyses seems to be primarily one of poetics, not hermeneutics. According to the typology set forth in Part I, engaging in poetics means starting from intuition and then seeking out evidence within a text to justify that initial impression. The preceding discussion has demonstrated that judges, examining attorneys, and mark owners seem more inclined to reason backward from the outcome they desire or deem intuitively correct and highlight poetic devices in support of that outcome than to begin from a neutral position and reason through the devices to the conclusion. In that respect, the poetics of trademark law is not just a discussion of devices but an illustration of legal realism in action.

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attends writing a poem or composing a song: thoughtfulness about the message that the choice of name will communicate; the incorporation of cultural and other references; decisions about rhythm, meter, spelling, and other prosodic elements; and the purposeful claiming of that act of creation as one's own." Laura A. Heymann, *A Name I Call Myself: Creativity and Naming*, 2 U.C. IRVINE L. REV. 585, 588–89 (2012).

448. JAMES BOYD WHITE, *The Judicial Opinion and the Poem: Ways of Reading, Ways of Life*, *in* HERACLES' BOW: ESSAYS ON THE RHETORIC AND POETICS OF THE LAW 123 (1985).

449. WHITE, *supra* note 448, at 127.

450. *See In re* Trade-Mark Cases, 100 U.S. 82, 93–94 (1879). Psychological research has "highlighted emotional responses to rhyme and better memory recall as a result of alliteration." Awel Vaughan-Evans, Robat Trefor, Llion Jones, Peredur Lynch, Manon W. Jones & Guillaume Thierry, *Implicit Detection of Poetic Harmony by the Naïve Brain*, 7 FRONT. PSYCHOLOGY 1859, 1859 (citing Christian Obermeier, Winfried Menninghaus, Martin von Koppenfels, Tim Raettig, Maren Schmidt-Kassow, Sascha Otterbein & Sonja A. Kotz, *Aesthetic and Emotional Effects of Meter and Rhyme in Poetry*, 4 FRONTIER PSYCH. 10, 10 (2013); David Ian Hanauer, *The Task of Poetry Reading and Second Language Learning*, 22 APPLIED LINGUISTICS, 295 (2001); R. Brooke Lea, David N. Rapp, Andrew Elfenbein, Aaron D. Mitchel & Russell Swinburne Romine, *Sweet Silent Thought: Alliteration and Resonance in Poetry Comprehension*, 19 PSYCH. SCI. 709 (2008).).

Every word mark incorporates rhetorical devices or strategies to a greater or lesser extent. Not every mark is a rhyming MELLO YELLO or an alliterative TEN TON TITMOUSE, but even the blandest marks—GENERAL MOTORS, ALL-BRAN, AMALGAMATED BANK—reflect rhetorical choices that shape consumer perception. That rhetorical structure is how trademarks function: they conjure up and serve as a repository for associations, connotations, and ideas; they represent and stand in for a product or a company. The trope in which one attribute or idea stands in for another,[451] like "the White House" for the presidency or "suits" for businesspeople, is called **METONYMY** [meh-TOH-nih-mee].[452] Metonymy is not just one more poetic device to add to the list; instead, it encapsulates precisely what trademarks do.[453] Enabling readers to understand one concept in terms of another by providing a single term or symbol that stands in for a whole set of associations is trademarks' raison d'etre. Poetic devices can lend us the vocabulary to articulate how marks do what they do—even if a trademark is something more insidious than a tiny poem.

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451. Bernard Dupriez, *Metonymy*, *in* A DICTIONARY OF LITERARY DEVICES: GRADUS A-Z 280–284 (Albert Halsall trans., Univ. of Toronto Press 1991).

452. *See*, *e.g.*, Warner Bros. Co. v. Jantzen, Inc., 150 F. Supp. 531, 533 (S.D.N.Y. 1956) ("Although there was abundant evidence at the trial showing that the women's garment trade and its advertising agencies make extensive use of the literary device of metonymy to transfer to the product being purveyed the qualities which it is hoped will be engendered or improved in the wearer, utilization of this literary device cannot act to make descriptive a word which itself is not."), *aff'd*, 249 F.2d 353 (2d Cir. 1957); *In re* Expand Beyond Corp., No. 76189419, at *7 (T.T.A.B. May 28, 2004) ("Applicant argues that COMMAND CENTER is not merely descriptive of the goods [computer software] because it is a 'metonymy,' a figure of speech wherein one thing is used to represent another.").

453. Heymann, *supra* note 392, at 1346–47 ("Trademarks are . . . used as a substitute for the corporation itself . . . such as the use of 'Budweiser' as a substitute for 'the beer made by the Anheuser-Busch company' (as in 'I'd like a Budweiser, please')."); *see also* McQuarrie & Mick, *supra* note 35, at 433 (offering Buick's use of "the imports are getting nervous" as an example of metonym in advertising). Dustin Marlan makes a similar argument, characterizing all inherently distinctive trademarks as metaphors. Marlan, *supra* note 59, at 770–71 ("Under the imagination test, a word mark is considered *inherently* distinctive if the mark is a *verbal* metaphor (i.e., a figure of speech) that suggests qualities, values, or aesthetics relating to its associated product or service . . . . Because marks are symbols—and the sine qua non of a symbol is its figurative quality—trademark law properly uses a figure of speech as its doctrinal trigger in evaluating the distinctiveness of word marks."). Robert Frost, meanwhile, has argued that "[poetry] is metaphor, saying one thing and meaning another, saying one thing in terms of another . . . Poetry is simply made of metaphor." Robert Frost, *The Constant Symbol*, *prefatory essay in* THE POEMS OF ROBERT FROST (1946). Other scholars have posited that metonymy and metaphor are not limited to the worlds of literature and language, but instead correspond to "a fundamental mode of thought characterized as understanding one concept 'in terms of another.'" GEORGE LAKOFF & MARK JOHNSON, METAPHORS WE LIVE BY 5 (1980) (cited in Marlan, *supra* note 59, at 772).

MODERATING MONOPOLIES

Nikolas Guggenberger[†]

ABSTRACT

Industrial organization predetermines content moderation online. At the core of today's dysfunctions in the digital public sphere is a market power problem. Meta, Google, Apple, and a few other digital platforms control the infrastructure of the digital public sphere. A tiny group of corporations governs online speech, causing systemic problems to public discourse and individual harm to stakeholders. Current approaches to content moderation build on a deeply flawed market structure, addressing symptoms of systemic failures at best and cementing ailments at worst.

Market concentration creates monocultures for communication susceptible to systemic failures and raises the stakes for individual content moderation decisions, like takedowns of posts or bans of individuals. As these decisions are inherently prone to errors, those errors are magnified by the platforms' scale and market power. Platform monopolies also harm individual stakeholders: persisting monopolies lead to higher prices, lower quality, or less innovation. As platforms' services include content moderation, degraded services may increase the error rate of takedown decisions and over-expose users to toxic content, misinformation, or harassment. Platform monopolies can also get away with discriminatory and exclusionary conduct more easily because users lack voice and exit opportunities.

Stricter antitrust enforcement is imperative, but contemporary antitrust doctrine alone cannot hope to provide sufficient relief to the digital public sphere. First, a narrowly understood consumer welfare standard overemphasizes easily quantifiable, short-term price effects. Second, the levels of concentration necessary to trigger antitrust scrutiny far exceed those of a market conducive to pluralistic discourse. Third, requiring specific anticompetitive conduct, the focal point of current antitrust doctrine, ignores structural dysfunction mighty bottlenecks create in public discourse, irrespective of the origins or even benevolent exercise of their power.

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In this Article, I suggest three types of remedies to address the market power problem behind the dysfunctions in the digital public sphere. First, mandating active interoperability between platforms would drastically reduce lock-in effects. Second, scaling back quasi-property exclusivity online would spur follow-on innovation. Third, no-fault liability and broader objectives in antitrust doctrine would establish more effective counterweights to concentrating effects in the digital public sphere. While these pro-competitive measures cannot provide a panacea to all online woes, they would lower the stakes of inevitable content moderation decisions, incentivize investments in better decision-making processes, and contribute to healthier pluralistic discourse.

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I. INTRODUCTION

Today's dysfunction of the digital public sphere[1] is, at its core, a market power problem. A total of three companies—Apple, Google, and Meta—control the most relevant bottlenecks for digital communication.[2] Facebook (owned by Meta) retains a firm grip on social media; YouTube (owned by Google) dominates video sharing; Google runs, by far, the most utilized general search engine; and Apple and Google control the two relevant app stores in the United States. These platforms govern discourse as gatekeepers.[3] The resulting market conditions fail at "providing an environment conducive to the preservation of our democratic political and social institutions"[4] and create a wide range of troubles.

Market concentration raises the stakes of individual content moderation decisions, like takedowns or bans. As these decisions are inherently prone to

1. *See* Jack M. Balkin, *How to Regulate (and Not Regulate) Social Media*, 1 J. FREE SPEECH L. 71, 72 (2021) (defining the digital public sphere as a "space in which people express opinions and exchange views that judge what is going on in society") [hereinafter Balkin, *How to Regulate (and Not Regulate) Social Media*]. For accounts of dysfunction, see generally, for example, DANIELLE KEATS CITRON, HATE CRIMES IN CYBERSPACE (2014) (analyzing how digital networks have become tools for harassment and how individuals and online mobs disproportionately target women); SAFIYA UMOJA NOBLE, ALGORITHMS OF OPPRESSION: HOW SEARCH ENGINES REINFORCE RACISM (2018) (detailing discrimination by search engines); ZEYNEP TUFEKCI, TWITTER AND TEAR GAS: THE POWER AND FRAGILITY OF NETWORKED PROTEST 221–31 (2017) (emphasizing threats to discourse, including from censorship "as a denial of attention, focus, and credibility"); SIVA VAIDHYANATHAN, ANTISOCIAL MEDIA: HOW FACEBOOK DISCONNECTS US AND UNDERMINES DEMOCRACY (2018); TIM WU, THE ATTENTION MERCHANTS: THE EPIC SCRAMBLE TO GET INSIDE OUR HEADS (2017) (identifying the consequences of attention scarcity); Jack M. Balkin, *Free Speech is a Triangle*, 118 COLUM. L. REV. 2011, 2016–21 (2018) (focusing on collateral censorship and prior restraint) [hereinafter Balkin, *Free Speech is a Triangle*]; Bobby Chesney & Danielle Citron, *Deep Fakes: A Looming Challenge for Privacy, Democracy, and National Security*, 107 CALIF. L. REV. 1753, 1771–85 (2019) (detailing harms from deep fakes); Zeynep Tufekci, *YouTube, the Great Radicalizer*, N.Y. TIMES (Mar. 3, 2018), https://www.nytimes.com/2018/03/10/opinion/sunday/youtube-politics-radical.html (identifying YouTube's algorithm as a driver of radicalization online).

2. Lina M. Khan, *The Ideological Roots of America's Market Power Problem*, 127 YALE L.J. F. 960, 961 (2018). *See infra* Part I.

3. *See* Thomas Kadri, *Digital Gatekeepers*, 99 TEX. L. REV. 951 (2021); Kate Klonick, *The New Governors, The People, Rules, and Processes Governing Online Speech*, 131 HARV. L. REV. 1598 (2018); Rory Van Loo, *The New Gatekeepers: Private Firms as Public Enforcers*, 106 VA. L. REV. 467 (2020); Rory Van Loo, *Federal Rules of Platform Procedure*, U. CHI. L. REV. 829 (2021).

4. *See* N. Pac. Ry. Co. v. United States, 356 U.S. 1, 4 (1958) (defining the goals of antitrust law). *But see* more recently NCAA v. Alston, No. 20-512, slip op. at 5 (U.S. June 21, 2021) (dropping the reference to democratic institutions).

errors,[5] the platforms' scale and market power magnifies any misjudgments and resulting error costs. On sensitive matters, we trust the instincts of one man, Mark Zuckerberg, to make correct decisions on content for 240 million American social media users, for example.[6] President Trump was banned from the biggest social media platform on earth when Mark Zuckerberg wanted it—not earlier and not later. With that, Mark Zuckerberg's ability and integrity become single points of failure in the digital public sphere, undermining the resilience of democratic discourse. Similarly, market concentration creates monocultures for communication susceptible to systemic failures.[7] For instance, foreign agents and profit-seeking teenagers have exploited Facebook's algorithms to spread misinformation.[8] Facebook's dominant market position arguably elevates internal management failures and architectural flaws to systemic threats for democratic deliberation and the electoral process.

Platform monopolies also harm individual stakeholders.[9] Generally, monopolies lead to higher prices, lower quality, and less innovation. The monetary prices for Facebook, YouTube, Google, and the app stores have remained at zero. But platform monopolies can degrade the services they provide in exchange for users' endurance of advertisements and provision of content and data. As platforms' services include content moderation, degraded services may increase the error rate of takedown decisions and overexpose users to toxic content, misinformation, or harassment. For perspective, Facebook's automated systems currently remove "posts that generated 3% to 5% of the views of hate speech on the platform, and 0.6% of all content that

5. evelyn douek, *Governing Online Speech: From "Posts-as-Trumps" to Proportionality and Probability*, 121 COLUM. L. REV. 759 (2021).

6. *See* Alexis C. Madrigal, *Mark Zuckerberg's Power Is Unprecedented*, ATLANTIC (May 9, 2019), https://www.theatlantic.com/technology/archive/2019/05/how-powerful-mark-zuckerberg/589129/; *Number of Facebook users in the United States from 2018 to 2027*, STATISTA, https://www.statista.com/statistics/408971/number-of-us-facebook-users/ (last visited Oct. 17, 2022).

7. *See infra* Part II.A.

8. SELECT COMMITTEE ON INTELLIGENCE, RUSSIAN ACTIVE MEASURES CAMPAIGNS AND INTERFERENCE IN THE 2016 U.S. ELECTION, VOL. 4 (2020); Nicholas Confessore, *Cambridge Analytica and Facebook: The Scandal and the Fallout So Far*, N.Y. TIMES (Apr. 4, 2018), https://www.nytimes.com/2018/04/04/us/politics/cambridge-analytica-scandal-fallout.html; Samanth Subramanian, *Inside the Macedonian Fake-News Complex*, WIRED (Feb. 15, 2017), https://www.wired.com/2017/02/veles-macedonia-fake-news/; Matthew Rosenberg, Nicholas Confessore & Carole Cadwalladr, *How Trump Consultants Exploited the Facebook Data of Millions*, N.Y. TIMES (Mar. 17, 2018), https://www.nytimes.com/2018/03/17/us/politics/cambridge-analytica-trump-campaign.html.

9. *See infra* Part II.B.

violated Facebook's policies against violence and incitement."[10] Monopolies can also get away with discriminatory conduct more easily because users have nowhere else to go. This ranges from special treatment for influential celebrities harming ordinary users[11] to the disproportionate takedown of LGBTQ+ expression[12] and bias against African-American English in content analysis.[13]

Recent approaches to fixing content moderation build on a deeply flawed market structure; they provide the right answer to the wrong question. Take, for example, the Facebook Oversight Board ("Board"), a novel semi-autonomous entity charged with assessing questions related to takedowns of content, declinations of removal requests, and when referred by Facebook, bans of individuals. The Board necessarily operates within the boundaries defined by Facebook and the highly concentrated market. It cannot compensate for the lack of pluralistic structures and competitive pressures. It neither lowers the stakes of individual decisions on content, nor does it substitute exit opportunities. To a significant extent, the contemporary issue of content moderation only exists because of concentrated private sector control over the digital infrastructure. The focus on processes and new institutions to improve content moderation implicitly accepts the market and social structure in which digital platforms currently operate.[14] It seeks to fortify

10. Deepa Seetharaman, Jeff Horwitz & Justin Scheck, *Facebook Says AI Will Clean Up the Platform. Its Own Engineers Have Doubts.*, WALL ST. J. (Oct. 17, 2021, 9:17 AM), https://www.wsj.com/articles/facebook-ai-enforce-rules-engineers-doubtful-artificial-intelligence-11634338184.

11. Jeff Horwitz, *Facebook Says Its Rules Apply to All. Company Documents Reveal a Secret Elite That's Exempt.*, WALL ST. J. (Sep. 13, 2021, 10:21 AM), https://www.wsj.com/articles/facebook-files-xcheck-zuckerberg-elite-rules-11631541353; Marshall Steinbaum, *Establishing Market and Monopoly Power in Tech Platform Antitrust Cases*, 67 ANTITRUST BULLETIN 1, 13 (2022).

12. Ari Ezra Waldman, *Disorderly Content*, 97 WASH. L. REV. 907 (2022); *see also* Kendra Albert & Afsaneh Rigot, *Apple and Google Still Have an LGBTQ Problem*, WIRED UK (Aug. 16, 2021), https://www.wired.co.uk/article/apple-google-lgbtq-apps.

13. Thomas Davidson, Debasmita Bhattacharya & Ingmar Weber, *Racial Bias in Hate Speech and Abusive Language Detection Datasets*, *in* PROCEEDINGS OF THE THIRD WORKSHOP ON ABUSIVE LANGUAGE ONLINE 25, 32 (Sarah T. Roberts et al. eds., 2019) (finding "substantial racial bias" "in hate speech and abusive language detection datasets""); Maarten Sap, Dallas Card, Saadia Gabriel, Yefin Choi & Noah A. Smith, *The Risk of Racial Bias in Hate Speech Detection*, *in* PROCEEDINGS OF THE 57TH ANNUAL MEETING OF THE ASSOCIATION FOR COMPUTATIONAL LINGUISTICS 1668, 1671 (Anna Korhonen et al. eds., 2019) ("AAE tweets are more than twice as likely to be labeled as 'offensive' or 'abusive'"). *See* NOBLE, *supra* note 1.

14. Ethan Zuckerman, *The Case for Digital Public Infrastructure*, KNIGHT FIRST AMEND. INST. 6 (Jan. 17, 2020), https://knightcolumbia.org/content/the-case-for-digital-public-infrastructure.

the legitimacy of decision-making that should not require invocation in the first place.

Although antitrust law is a central element of constructing competitive markets,[15] its current interpretation fails to compensate for the enormous, legally constructed and reinforced[16] concentrating forces in the digital economy. First, it is concerned with effects on consumer welfare, an efficiency standard. Efficiency and pluralism, however, do not necessarily run hand in hand. Second, decades of increasing the thresholds for antitrust liability and weakening enforcement have diminished the framework's potential to serve as an effective check on private power. Third, and most importantly, antitrust doctrine requires anticompetitive conduct in addition to monopoly power. It takes no issue with organic growth or the mere existence of monopolies.[17] As for public discourse, however, mighty bottlenecks create structural dysfunction, irrespective of their origins or the potentially innocent exercise of their power.

In this Article, I offer a cautious case for digital pluralism, acknowledging that it falls short of curing all ills. The best argument for a more pluralistic digital public sphere is its propensity to reduce the cost of errors by individuals designing ecosystems for communication and curating content. Without guaranteeing public-regarding actors and functioning institutions, the Madisonian principle[18] can increase the resilience of public discourse and provide for a more inclusive and equitable digital public sphere. Additionally, a more competitive platform market will transfer surplus and funding to the content creation level, where it can support journalism, art, and other types of quality content production.

To end platform monopolies and strengthen digital pluralism, I argue for the adoption of interoperability frameworks.[19] First, this requires mandates to open application programming interfaces (APIs), which allow the exchange of information between platforms. Implementing an interoperability framework would enable communication across the boundaries of platforms. Where interoperability mandates and open standards define the market, network effects no longer translate into market entry barriers. Second, we should

15. William N. Eskridge Jr. & John Ferejohn, *Super-Statutes*, 50 DUKE L.J. 1215, 1231–37 (2001) (identifying the Sherman Act as a super-statute); Thomas B. Nachbar, *The Antitrust Constitution*, 99 IOWA L. REV. 57, 60 (2013).

16. Nikolas Guggenberger, Allocating Network Effects (Apr. 2023) (unpublished manuscript on file with author).

17. United States v. Grinnell Corp., 384 U.S. 563, 570–71 (1966).

18. *See* THE FEDERALIST NO. 10 (James Madison).

19. Michael Kades & Fiona M. Scott Morton, *Interoperability as a Competition Remedy for Digital Networks* 14, 33 (Sep. 23, 2020) (Wash. Ctr. for Equitable Growth, Working Paper).

remove some of the legal "bricks" that enclose platforms' walled gardens. This entails reducing the level of exclusivity bestowed on digital platforms by restricting the reach of the Computer Fraud and Abuse Act (CFAA), limiting the state backing of terms of service, curbing intellectual property (IP) rights, and reorienting privacy protection. Furthermore, emphasizing structural considerations over specific anticompetitive behavior[20] and reestablishing antitrust law's democracy-serving function can reestablish antitrust law as a meaningful check on private power.

This Article proceeds in four parts. Part II identifies the status quo of what Morgan Weiland aptly calls the "intermediated public sphere"[21] as highly monopolized. Relying on two levers of power, network effects and the characteristics of data, three companies dominate the four bottlenecks of digital discourse, excreting outsized market power, political power, and cultural power. In Part III, I show how platforms' position in the market harms public discourse and how content moderation fails to compensate for the flawed market structure. I also identify the systemic reasons for antitrust law's compensatory failure. In Part IV, I lay out suitable interoperability remedies and recommend reestablishing structural notions of antitrust to create "an environment conducive to the preservation of our democratic political and social institutions."[22]

II. THE MONOPOLIZED DIGITAL PUBLIC SPHERE

While the U.S. economy as a whole is experiencing historic levels of consolidation, platform markets have become notorious for their concentration.[23] The accumulation of economic, political, and cultural power

20. *See* Donald F. Turner, *The Scope of Antitrust and Other Economic Regulatory Policies*, 82 HARV. L. REV. 1207, 1219–20 (1969).

21. Morgan N. Weiland, The 'Intermediated Public Sphere' (2021) (unpublished manuscript) (on file with author).

22. *See* N. Pac. Ry. Co. v. United States, 356 U.S. 1, 4 (1958).

23. Council of Econ. Advisers, *Benefits of Competition and Indicators of Market Power* 4–7 (2016); THOMAS PHILIPPON, THE GREAT REVERSAL: HOW AMERICA GAVE UP ON FREE MARKETS (2019); David Autor, David Dorn, Lawrence F. Katz, Christina Patterson & John Van Reenen, *The Fall of the Labor Share and the Rise of Superstar Firms*, 135 Q.J. ECON. 645, 683, 663–65 (2020); Kenneth A. Bamberger & Orly Lobel, *Platform Market Power*, 32 BERKELEY TECH. L.J. 1051, 1067–71 (2017); Sara Calligaris, Chiara Criscuolo & Luca Marcolin, *Mark-Ups in the Digital Era* 13–18 (OECD Sci., Tech. & Indus. Working Papers No. 10, 2018) (focusing on mark-ups); Matias Covarrubias, Germán Gutiérrez & Thomas Philippon, *From Good to Bad Concentration? US Industries over the Past 30 Years*, 34 NBER MACROECON. ANN. 1 (2020); Jan De Loecker & Jan Eeckhout, *The Rise of Market Power and the Macroeconomic Implications*, 135 Q.J. ECON. 561, 574–605 (2020) (observing rising market power based on increasing markups and average profits); Jason Furman & Peter Orszag, *A Firm-Level Perspective*

in the hands of a few digital platforms has prompted proclamations of a Second Gilded Age[24]—an ode to a time in which the oil, steel, and railroad barons of the second Industrial Revolution possessed similarly defining influence.[25] In that analogy, the modern-day Carnegies, Rockefellers, and Vanderbilts also command the crucial infrastructure and resources of their time, including social media and video sharing platforms, search engines, and app stores.[26] Today's industrialists privately govern discourse in the digital public sphere.[27]

That has not always been the case.[28] Sergey Brin and Larry Page did not found Google until 1998. And it was not until 2003 that Facebook launched. The creation of the World Wide Web in the early 1990s expanded the public sphere in a pluralistic manner. What started as a protocol to link files and organize information, accessible through a browser, soon morphed into online billboards, chat rooms and, eventually, a vibrant, albeit largely homogenous, blogger scene.

To be sure, digital platforms have existed since the dawn of the web. Some tried to create walled gardens of secluded and tightly protected private networks. Yet, these early walled gardens failed. Internet users, policy makers,

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on the Role of Rents in the Rise in Inequality, *in* TOWARD A JUST SOCIETY: JOSEPH STIGLITZ AND TWENTY-FIRST CENTURY ECONOMICS 19, 33–38 (Martin Guzman ed., 2018); Germán Gutiérrez & Thomas Philippon, *Declining Competition and Investment in the U.S.*, (Nat'l Bureau of Econ. Rsch., Working Paper No. 23583 2017), https://www.nber.org/papers/w23583; Marc Jarsulic, *Antitrust Enforcement for the 21st Century*, 64 ANTITRUST BULL. 514 (2019); Mordecai Kurz, On the Formation of Capital and Wealth: IT, Monopoly Power and Rising Inequality (Stan. U., Working Paper No. 17-016 2017), https://papers.ssrn.com/abstract=3014361 (linking technological progress, market power, and inequality).

24. *See* TIM WU, THE CURSE OF BIGNESS: ANTITRUST IN THE NEW GILDED AGE (2018); Jack M. Balkin, *The First Amendment in the Second Gilded Age*, 66 BUFF. L. REV. 979, 980–81, 1000 (2018) ("Instead of Rockefeller, and Vanderbilt, and Carnegie, we have Gates, and Zuckerberg, and Brin, and Schmidt."); Steven C. Salop, *Dominant Digital Platforms: Is Antitrust Up to the Task?*, 130 YALE L.J. F. 563, 565 (2021); Sandeep Vaheesan, *Accommodating Capital and Policing Labor: Antitrust in the Two Gilded Ages*, 78 MD. L. REV. 766, 792–809 (2019) (discussing antitrust enforcement); Steven Davidoff Solomon, *Changing Old Antitrust Thinking for a New Gilded Age*, NY TIMES DEALBOOK (Jun. 22, 2014), https://dealbook.nytimes.com/2014/07/22/changing-old-antitrust-thinking-for-a-new-gilded-age/ (discussing mergers).

25. *See* Andrew Atkeson & Patrick J. Kehoe, *The Transition to a New Economy After the Second Industrial Revolution* (Fed. Rsrv. Bank of Minn. July 2001).

26. All five of the most valuable U.S. companies operate digital platforms, provide software solutions, computing capacity, or IT hardware.

27. Klonick, *supra* note 3.

28. A. Michael Froomkin, *Habermas@Discourse.Net: Toward a Critical Theory of Cyberspace*, 116 HARV. L. REV. 749, 782–96 (2003) (detailing the evolution of the internet infrastructure); Alan Z. Rozenshtein, *Moderating the Fediverse: Content Moderation on Distributed Social Media*, 2 JOURNAL OF FREE SPEECH LAW 3–5 (forthcoming 2023).

and regulators rejected the idea that firms like AOL and the mighty telecommunication companies of the time could effectively partition the open internet into corporate subdivisions. At a pivotal moment, network neutrality requirements prevented telecommunication companies from leveraging their monopoly positions at the infrastructure level into the emerging application layer of the internet.[29]

With the rise of digital superstars,[30] things have changed. As Julie Cohen aptly observes, "[i]n theory, the networked information infrastructure still known as the internet is 'open', and for some purposes, that characterization is accurate." Countless blogs, local news sites, and businesses populate the web. "For most practical purposes, however," Cohen continues, "the 'network of networks' is becoming a network of platforms."[31] In fact, a handful of digital platforms control the central chokepoints of the internet, provide the defining communication infrastructure, and govern discourse.[32]

This transformation from an open internet to a network of platforms is full of contradictions. On the one hand, it is a story of innovation, expansion of access to information and communicative spaces, inclusion, and democratization of public discourse.[33] On the other hand, the sector's maturation stands for rampant economic and political concentration of power, abusive and intrusive business models, mass surveillance, and rampant spread of misinformation. Google's "mission . . . to organize the world's information and make it universally accessible and useful,"[34] and Facebook's recently revised goal to "[g]ive people the power to build community and bring the world closer together,"[35] have simultaneously succeeded and failed. In large

29. *See* BARBARA VAN SCHEWICK, INTERNET ARCHITECTURE AND INNOVATION (2010); Brett M. Frischmann & Barbara van Schewick, *Network Neutrality and the Economics of an Information Superhighway: A Reply to Professor Yoo*, 47 JURIMETRICS 383 (2007); Thomas B. Nachbar, *The Public Network*, 17 COMMLAW CONSPECTUS 67, 109–13 (2008); Barbara van Schewick, *Network Neutrality and Quality of Service: What a Nondiscrimination Rule Should Look Like*, 67 STAN. L. REV. 1 (2015).

30. *See* Autor et al., *supra* note 23 (describing "superstar firms" as drivers of concentration).

31. JULIE E. COHEN, BETWEEN TRUTH AND POWER: THE LEGAL CONSTRUCTIONS OF INFORMATIONAL CAPITALISM 41 (2019).

32. Andrea Prat & Tommaso M. Valletti, *Attention Oligopoly*, AM. ECON. J. MICROECON. (forthcoming 2022).

33. *See* TUFEKCI, TWITTER AND TEAR GAS, *supra* note 1, at 118–26; Gabe H. Miller, Guadalupe Marquez-Velarde, Apryl A. Williams & Verna M. Keith, *Discrimination and Black Social Media Use: Sites of Oppression and Expression*, 7 SOC. RACE & ETHNICITY 247, 252 (2021).

34. *Our Approach to Search*, GOOGLE, https://www.google.com/search/howsearchworks/mission/ (last visited July 5, 2021).

35. *About Meta*, META, https://about.meta.com/company-info/?utm_source=about.facebook.com&utm_medium=redirect (last visited Nov. 5, 2022).

part, the development of the digital public sphere reflects the broader contradictions of the neoliberal project. The following sections focus on four bottlenecks of discourse and the origins of their economic, political and cultural power.

A. FOUR BOTTLENECKS OF DISCOURSE

Four main bottlenecks define the monopolistic structure of the digital public sphere's content layer: Facebook (owned by Meta) retains a firm grip on social media; YouTube (owned by Google) dominates video sharing; Google runs the most utilized general search engine; and Apple and Google control the most prominent app stores in the United States. Some of the platforms' features overlap, like the ability to share videos. Yet, the platforms' core functionalities and usage patterns remain sufficiently distinct to justify a categorical consideration.[36]

1. Social Media

With its enormous social graph and its unparalleled reach, Meta has emerged as the most prominent and consequential social media conglomerate. The various platforms of the Menlo Park company, including Instagram, WhatsApp, and the core Facebook network, reach almost all demographic groups in the United States.[37] Approximately 235 million monthly active users populate the social network's core platform in the United States,[38] which amounts to a penetration rate of 70%.[39] Instagram attracts around 118 million active users[40]—about 40% of the United States online population.[41] The FTC

36. First Amended Complaint at 57–58, FTC v. Facebook, No. 1:20-cv-03590, Doc. 75-1 (D.D.C. Aug. 19, 2021).

37. John Gramlich, *10 Facts about Americans and Facebook*, PEW RSCH. CTR. (Apr. 1, 2021), https://www.pewresearch.org/fact-tank/2021/06/01/facts-about-americans-and-facebook/ . *See also* NapoleonCat, *Distribution of Facebook users in the United States as of April 2021, by age group and gender*, STATISTA, https://www.statista.com/statistics/187041/us-user-age-distribution-on-facebook/ (last visited July 6, 2021) (showing distribution by age group and gender).

38. *Forecast of the number of Facebook users in the United States from 2017 to 2025 (in millions)*, STATISTA, https://www.statista.com/forecasts/1136345/facebook-users-in-the-united-states (last visited Jan. 13, 2022).

39. *Facebook usage penetration in the United States from 2017 to 2025*, STATISTA, https://www.statista.com/statistics/183460/share-of-the-us-population-using-facebook/ (last visited July 6, 2021).

40. eMarketer, *Number of Instagram users in the United States from 2019 to 2023 (in millions)*, STATISTA, https://www.statista.com/statistics/293771/number-of-us-instagram-users/ (last visited July 6, 2021).

41. eMarketer & Forbes, *Instagram penetration rate in the United States from 2018 to 2023*, STATISTA, https://www.statista.com/statistics/293778/us-instagram-penetration/ (last visited July 6, 2021).

provided a convincing account of Facebook's monopoly position in its recent amended complaint,[42] addressing doubts previously articulated by the D.C. District Court.[43] Depending on the metric—daily active users, monthly active users, time spent on the platform, or advertising revenues—Facebook commands a market share of 65-80% of social media services.[44] For publishers, social media has become an essential channel for dissemination.[45] Likewise, corporate and political advertisers depend on the unique reach of Facebook's social graph.[46] Facebook has even emphasized small businesses' reliance on its services in a recent campaign against Apple's allegedly more privacy-protective default settings.[47]

Unlike Facebook, Twitter's content focuses more on punditry, political messaging, and academic discourse. Where Facebook functions as an all-encompassing social networking site, Twitter biggest impact stems from its role as a content amplifier.[48] News outlets and cable TV frequently pick up viral Tweets and share them with their audiences. Despite that, even Twitter's indirect impact provides little substitute to Facebook's penetration rate; the difference in the number of active users and time spent on the medium is too large. Twitter's user base also lacks breadth, leaning toward young, politically

42. First Amended Complaint at 60–72, FTC v. Facebook, No. 1:20-cv-03590, Doc. 75-1 (D.D.C. Aug. 19, 2021).

43. Memorandum Opinion at 2, FTC v. Facebook, No. 1:20-cv-03590, Doc. 73 (D.D.C. 2021); Complaint, No. 1:20-cv-03590, Doc. 3 (D.D.C. Dec. 9, 2020).

44. *Desktop, Mobile & Tablet Social Media Stats United States Of America*, STATCOUNTER GLOBAL STATS, https://gs.statcounter.com/social-media-stats/desktop-mobile-tablet/united-states-of-america (last visited Oct. 17, 2021); First Amended Complaint at 63–68, *FTC v. Facebook*, No. 1:20-cv-03590, Doc. 75-1.

45. Lina M. Khan, *The Separation of Platforms and Commerce*, 119 COLUM. L. REV. 973, 1003–05 (2019).

46. *See* Anna Edgerton, *Facebook Is the Only Game in Town for Digital Political Ads*, BLOOMBERG BUSINESSWEEK (Oct. 5, 2022), https://www.bloomberg.com/news/articles/2022-10-05/facebook-is-politicians-last-resort-for-2022-election-ads.

47. Chaim Gartenberg, *Why Apple's New Privacy Feature is Such a Big Deal*, VERGE (Apr. 27, 2021), https://www.theverge.com/2021/4/27/22405474/apple-app-tracking-transparency-ios-14-5-privacy-update-facebook-data; Dan Levy, *Speaking Up for Small Businesses*, FACEBOOK FOR BUSINESS (Dec. 16, 2020), https://www.facebook.com/business/news/ios-14-apple-privacy-update-impacts-small-business-ads; Tom Warren, *Facebook Criticizes Apple's IOS Privacy Changes with Full- Page Newspaper Ads*, VERGE (Dec. 16, 2020), https://www.theverge.com/2020/12/16/22178068/facebook-apple-newspaper-ads-ios-privacy-changes. *See also* Geoffrey A. Fowler & Tatum Hunter, *When you 'Ask app not to track,' some iPhone apps keep snooping anyway*, WASH. POST (Sep. 23, 2021), https://www.washingtonpost.com/technology/2021/09/23/iphone-tracking/.

48. *See* Philip M. Napoli, *Social Media and the Public Interest: Governance of News Platforms in the Realm of Individual and Algorithmic Gatekeepers*, 39 TELECOMM. POL'Y 751, 752 (2015) (describing Twitter's role in facilitating reports from the protests following the shooting of Michael Brown).

active, high-income, high-education, and urban subscribers.[49] Other social media platforms lack any equivalent to Facebook or Twitter's impact on the digital public sphere.[50]

As of 2021, Pinterest commands 12.1% of site visits[51] and 34% of 18–64-year-old social media consumers use the platform regularly.[52] The service, however, lacks Twitter's multiplier effect and any comparable power over political and cultural discourse. LinkedIn remains limited to job-related networking, recruiting, and professional topics, with an emphasis on white-collar users. Reddit offers a popular venue for subject-related discussions, but besides the occasional breakthrough (i.e., GameStop or Dogecoin price rallies) these chat rooms rarely shape public discourse in systemic ways, like Facebook or Twitter. Snapchat users mainly rely on the application for one-to-few communications that rarely reaches public channels. Snapchat's user base is also concentrated among teenagers and young adults,[53] and its overall appeal has decreased after several of Snapchat's characteristic features were incorporated by Instagram and Twitter.[54]

49. AudienceProject, *Reach of leading social networking sites used by Baby Boomer and Senior online users in the United States as of 3rd quarter 2020*, STATISTA, https://www.statista.com/statistics/309166/boomer-senior-social-networks/ (last visited Aug. 11, 2021). However, Twitter's newsfeeds show conservative bias. Wen Chen, Diogo Pacheco, Kai-Cheng Yang & Filippo Menczer, *Neutral Bots Probe Political Bias on Social Media*, 12 NATURE COMMC'NS 5580 (2021).

50. *Which social networks do you use regularly?*, STATISTA, https://www.statista.com/forecasts/997135/social-network-usage-by-brand-in-the-us (last visited Nov. 15, 2022). YoutTube and TikTok are here categorized as video sharing platforms.

51. StatCounter, *Leading social media websites in the United States as of September 2022, based on share of visits*, STATISTA, https://www.statista.com/statistics/265773/market-share-of-the-most-popular-social-media-websites-in-the-us/ (last visited Nov. 15, 2022).

52. *Which social networks do you use regularly?*, STATISTA, https://www.statista.com/forecasts/997135/social-network-usage-by-brand-in-the-us (last visited Nov. 15, 2022).

53. AudienceProject, *Reach of Leading Social Networking Sites Used by Baby Boomer and Senior Online Users in the United States as of 3rd Quarter 2020*, STATISTA, https://www.statista.com/statistics/309166/boomer-senior-social-networks/ (last visited Aug. 11, 2021); AudienceProject, *Reach of Leading Social networking Sites Used by Teenage and Young Adult Online Users in the United States as of 3rd Quarter 2020*, STATISTA, https://www.statista.com/statistics/199242/social-media-and-networking-sites-used-by-us-teenagers/ (last visited Aug. 11, 2021).

54. *See* Casey Newton, *Instagram's New Stories Are a near-Perfect Copy of Snapchat Stories*, VERGE (Aug. 2, 2016), https://www.theverge.com/2016/8/2/12348354/instagram-stories-announced-snapchat-kevin-systrom-interview.

2. Video Sharing

Video sharing platforms enable users to post, watch, and interact with video content. With 2.2 billion users globally, YouTube leads the field.[55] It generated $28.8B in advertising revenue in 2021, marking a considerable increase from $19.8B in 2020.[56] These figures do not include YouTube's subscription revenue.[57] In 2021, a staggering 81% of U.S. adults watched or shared videos on the platform, up from 73% in 2019.[58] Similar to Facebook, YouTube has become a truly intergenerational medium: while 18–29-year-olds are more likely to use YouTube (95%), roughly half of users over 65 also rely on Google's video sharing platform.[59] The platform reaches internet users across social classes, ethnicities, races, genders, educational backgrounds, and geographical locations within the United States.[60] YouTube's reach is incomparable to that of any other video sharing platform.

With an estimated 94.1 million users in the United States as of 2022,[61] TikTok has emerged as the runner-up in the world of video sharing. TikTok's influence on cultural matters is conspicuous and ranges from displays of dance to comedy and sports. In the wake of the 2020 presidential election, TikTokers even made inroads in political discourse.[62] Yet, like Snapchat, TikTok almost exclusively attracts young audiences. Only 11% of TikTok's users are 50 and

55. *Forecast of the Number of YouTube Users in the World from 2017 to 2025 (in Millions)*, STATISTA, https://www.statista.com/forecasts/1144088/youtube-users-in-the-world (last visited July 10, 2021).

56. Alphabet, Inc., *2021 Annual Report (Form 10-K)* 33 (Feb. 2022).

57. Abner Li, *Alphabet Reports Q4 2020 Revenue of $56.9 Billion*, 9TO5GOOGLE (Feb. 2, 2021), https://9to5google.com/2021/02/02/alphabet-q4-2020-earnings/; Abner Li, *YouTube Music/Premium Has 20 Million Paid Subscribers, 2M for YouTube TV*, 9TO5GOOGLE (Feb. 3, 2020), https://9to5google.com/2020/02/03/youtube-premium-subscribers/.

58. Brooke Auxier & Monica Anderson, *Social Media Use in 2021*, PEW RSCH. CTR. (Apr. 7, 2021), https://www.pewresearch.org/internet/2021/04/07/social-media-use-in-2021/; Andrew Perrin & Monica Anderson, *Share of U.S. Adults Using Social Media, Including Facebook, is Mostly Unchanged since 2018*, PEW RSCH. CTR. (Apr. 10, 2019), https://www.pewresearch.org/fact-tank/2019/04/10/share-of-u-s-adults-using-social-media-including-facebook-is-mostly-unchanged-since-2018/.

59. Auxier & Anderson, *supra* note 58.

60. *Id.*

61. eMarketer, *Number of TikTok users in the United States from 2019 to 2024 (in millions)*, STATISTA, https://www.statista.com/statistics/1100836/number-of-us-tiktok-users/ (last visited Jan. 13, 2022).

62. Sarah C. Haan, *Bad Actors: Authenticity, Inauthenticity, Speech, and Capitalism*, 22 U. PA. J. CONST. L. 619, 678–80 (2019); Taylor Lorenz, Kellen Browning & Sheera Frenkel, *TikTok Teens and K-Pop Stans Say They Sank Trump Rally*, N.Y. TIMES (Jun. 21, 2020), https://www.nytimes.com/2020/06/21/style/tiktok-trump-rally-tulsa.html.

above.[63] And while TikTok's three-minute limitation on the length of videos contributes to the platform's unique appeal as a fast-paced medium, it also limits TikTok's role in the digital public sphere. Many contributions from music videos to gaming streams and commentary require longer segments. Other video sharing platforms serve specific purposes for targeted audiences and therefore do not provide viable alternatives to YouTube. Twitch, a live streaming platform primarily for video gaming, falls into that category. Video on demand platforms, like Netflix, Amazon Prime, Hulu, HBO Max, and Disney+, provide no substitute to YouTube's user-generated content.

3. Search

Search engines index information online. Google's market share across platforms has consistently hovered just below 90% in the United States and just above 90% globally.[64] With 94% and 96% market share, respectively, Google holds an even tighter grip on the mobile search market in the United States and the world.[65] Google's indexing algorithm arguably provides the most influential central information directory ever created and, thus, the most powerful general-purpose gateway to information. Search engine optimization—the business of featuring content online so that it will be ranked higher by search engines—mainly involves adapting the display of information to Google's algorithms.

While popular content can undoubtedly attract direct traffic, other information would remain practically unnoticed if it were not included in Google's index. Thus, for a significant portion of online content, Google can unilaterally decide whether the information should be practically retrievable. It comes as no surprise that the most prominent battles over the accessibility of information online centers more on Google's indexing of information rather than the information itself. In *Google Spain*, the European Court of Justice picked up on that distinction not only because of a normative hierarchy in

63. App Ape, *Distribution of TikTok users in the United States as of March 2021, by age group*, STATISTA, https://www.statista.com/statistics/1095186/tiktok-us-users-age/ (last visited Aug. 11, 2021).

64. *Search Engine Market Share United States Of America*, STATCOUNTER GLOBAL STATS, https://gs.statcounter.com/search-engine-market-share/all/united-states-of-america (last visited Nov. 16, 2022); *Search Engine Market Share Worldwide*, STATCOUNTER GLOBAL STATS, https://gs.statcounter.com/search-engine-market-share (last visited Nov. 16, 2022).

65. *Mobile Search Engine Market Share United States Of America*, STATCOUNTER GLOBAL STATS, https://gs.statcounter.com/search-engine-market-share/mobile/united-states-of-america (last visited July 20, 2021); *Mobile Search Engine Market Share Worldwide*, STATCOUNTER GLOBAL STATS, https://gs.statcounter.com/search-engine-market-share/mobile/worldwide (last visited July 20, 2021).

protecting speech rights between Google and the news source to which Google linked, but also the defining differences in reach.[66]

4. App Stores

Finally, consider the Apple and Google app stores. These enable users to download and update mobile versions of social media, video sharing, search engines, and millions of other applications compatible with the two main operating systems—Apple iOS and Google Android. Outside China, Google and Apple remain the only relevant players. If the operators of the two app stores do not admit an app, there is no realistic alternative to get the app to market.[67] Since apps require specific programming based on the operating system, the two app stores are not necessarily substitutable.[68] Similarly, as many users tend to buy into only one of the smartphone ecosystems (single home), any developer who aims to reach certain users or user groups will be limited to the one app store that corresponds with the operating system that the users in question have adopted.[69] Only the most sophisticated users will "sideload" apps via third-party app stores, which could jeopardize existing warrantees for the device.[70]

Applications that provide communication infrastructure most likely depend on access to both app stores to enable sufficient coverage.[71] Even the notoriously exclusive discussion platform, Clubhouse, ultimately had to offer an Android version in light of stagnating download numbers in addition to its initial focus on Apple customers.[72] By deciding which applications to admit, the app stores also indirectly define their users' communicative affordances.

66. Case C-131/12, Google Spain SL v. Agencia Española de Protección de Datos, 2014 ECLI:EU:C:2014:317; *see also* Robert C. Post, *Data Privacy and Dignitary Privady: Google Spain, the Right to Be Forgotten, and the Construction of the Public Sphere*, 67 DUKE L.J. 981 (2018).

67. Nikolas Guggenberger, *The Essential Facilities Doctrine in the Digital Economy: Dispelling Persistent Myths*, 23 YALE J.L. & TECH. 301, 316–18 (2021).

68. Complaint at 16–19, Epic Games, Inc. v Apple, Inc., 13. Aug. 2020 (N.D. Cal.).

69. Guggenberger, *supra* note 67, at 317.

70. *Id.*

71. Damien Geradin & Dimitrios Katsifis, *The Antitrust Case Against the Apple App Store*, J. COMPETITION L. & ECON. 37 (2021); Guggenberger, *supra* note 67, at 317–18.

72. Guggenberger, *supra* note 67, at 318 n.72; Cristina Criddle, *Clubhouse Launches on Android as App Downloads Collapse*, BBC NEWS (May 10, 2021), https://www.bbc.com/news/technology-57058516; Kim Lyons & Jon Porter, *Clubhouse Comes to Android after More than a Year of IOS Exclusivity*, VERGE, https://www.theverge.com/2021/5/9/22424399/clubhouse-android-app-release-date-news-features (last visited May 13, 2021).

B. TWO LEVERS OF POWER

The conventional wisdom[73] explaining market concentration in the digital economy centers on two, mutually reinforcing levers of power: network effects and data.[74] Network effects result from network externalities, which describe the value additional users generate for other participants by creating new connections and enabling additional transactions. In the 1970s, Roland Artle and Christian Averous based their model of the telephone network on this assumption,[75] shortly before Jeffrey Rohlfs formulated a more general version of the relationship between the number of users and the value generated by the network.[76] Put simply, the more users a network connects and transactions it enables, the more valuable it becomes.[77] Where platforms serve at least two different sides of a market, network effects also manifest indirectly. They manifest on opposite sides of the market. For instance, app developers benefit from a large smartphone user base, while smartphone users benefit from the diversity of offers in an app store.

To be clear, under the current legal framework, strong positive network effects do not generally prevent competition. Rather, the presence of network effects frontloads competition into a short period prior to the tipping of the market. Investments during that period tend to be large, with platforms subsidizing their services—oftentimes over years—before hoping to turn a (monopoly) profit. Lina Khan detailed this strategy for the e-commerce platform Amazon.[78] In a world teeming with rapid technological changes of whole industries, this sequence can theoretically lead to Schumpeterian cycles of innovation through replacement. Especially in an architecture like the internet, where innovation might be added as a new layer on top of existing infrastructure, the risk of innovation foreclosure is real.

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73. *See* JOHN KENNETH GALBRAITH, THE AFFLUENT SOCIETY 6–16 (Houghton Mifflin 40th anniversary ed. 1998) (analyzing the dynamics of accepted narratives).

74. *See* DAVID SINGH GREWAL, NETWORK POWER: THE SOCIAL DYNAMICS OF GLOBALIZATION 26 (2008) (observing network power as a result of network effects and the crowding out of alternatives); Marco Iansiti, *The Value of Data and Its Impact on Competition* 3 (Harv. Bus. School NOM Unit Working Paper Nos. 22–002, 2021).

75. Roland Artle & Christian Averous, *The Telephone System as a Public Good: Static and Dynamic Aspects*, 4 BELL J. ECON. & MGMT. SCI. 89, 90, 97–98 (1973).

76. Jeffrey Rohlfs, *A Theory of Interdependent Demand for a Communications Service*, 5 BELL J. ECON. & MGMT. SCI. 16, 16 (1974) ("The utility that a subscriber derives from a communications service increases as others join the system.").

77. Artle & Averous, *supra* note 75, at 90, 97–98 (building on telephone networks).

78. Lina M. Khan, *Amazon's Antitrust Paradox*, 126 YALE L.J. 710 (2017).

Once the market tips in favor of the leading platform, the incentives of the platform shift—economically and politically.[79] As the network-effect-induced value gap between the incumbent platform and its rivals becomes an insurmountable market entry barrier, the quality of the service and innovation lose import: the advantages of size trump other features.[80] In the early stages, platforms often rely on open architectures, inviting downstream market participants into their ecosystems, to spur growth while competing for the market.[81] Once they have passed the market tipping point, they tend to close in to increase the efficiency of high-volume transactions or profits by excluding competitors.[82]

The second major lever of power is data. Sophisticated algorithms rely on huge data sets to draw inferences of value to the platforms,[83] enabling personalized content feeds to increase users' engagement and personalized advertisements to capitalize on that engagement. The incumbents' large data sets and their potential to continue collecting new data on an ongoing basis have become determining market entry barriers for nascent competitors.[84]

Multiple factors contribute to the concentrating effects of data. Data collection and processing reveal powerful economies of scale; it comes at near-zero marginal costs. Adding to that, data are relational; they reflect relationships between people, things, or conditions.[85] In economic terms, data's social dimension explains why the aggregate of a data set can be much

79. Mark Armstrong, *Competition in Two-Sided Markets*, 37 RAND J. ECON. 668, 668–70 (2006); Nikolas Guggenberger, *Essential Platforms*, 24 STAN. TECH. L. REV. 237, 282–83 (2021).

80. First Amended Complaint at 3, FTC v. Facebook, No. 1:20-cv-03590, Doc. 75-1 (D.D.C. Aug. 19, 2021); GREWAL, *supra* note 74, at 29.

81. *See* Geoffrey Parker & Marshall Van Alstyne, *Innovation, Openness, and Platform Control*, 64 MGMT. SCI. 3015 (2018).

82. First Amended Complaint at 4–5, 12–14, *FTC v. Facebook*, No. 1:20-cv-03590, Doc. 75-1. Champions of the one-monopoly-rent-theorem doubt the ability to increase profits by crowding out downstream competitors. *See* ROBERT H. BORK, THE ANTITRUST PARADOX: A POLICY AT WAR WITH ITSELF 140–41; 372–75 (1978); Richard A. Posner, *The Chicago School of Antitrust Analysis*, 127 U. PA. L. REV. 925, 927, 937 (1979). Yet, the necessary condition for the theorem remain exceptional, especially in digital markets. *See* JONATHAN B. BAKER, THE ANTITRUST PARADIGM: RESTORING A COMPETITIVE ECONOMY 85–86 (2019); VAN SCHEWICK, INTERNET ARCHITECTURE AND INNOVATION, *supra* note 29, at 225–82 (focusing on internet access); Einer Elhauge, *Tying, Bundled Discounts, And the Death of the Single Monopoly Profit Theory*, 123 HARV. L. REV. 397, 400–401 (2009); Khan, *supra* note 45, at 1093–94.

83. Alicia Solow-Niederman, *Information Privacy and the Inference Economy*, 117 NW. U. L. REV. 357 (2022).

84. Zachary Abrahamson, *Essential Data*, 124 YALE L.J. 867 (2014); Salomé Viljoen, *Democratic Data: A Relational Theory For Data Governance*, 131 YALE L.J. 573, 587 (2021) ("greater access to high quality data is a key competitive advantage").

85. Viljoen, *supra* note 84, at 603–13.

more valuable to a platform than its individual data points to the contributing users.[86] One user's contribution allows the platform to infer more information with higher accuracy about other users.[87]

Data collection and network effects mutually reenforce each other.[88] On the one hand, data collection builds on and benefits from network effects; on the other hand, it exacerbates the power of networks. Large networks aggregate large amounts of data. If network effects tip the market, they also tip the potential for data collection. Similarly, data aggregation allows for better network management, reducing the impacts of congestion. More granular personalization of content can mitigate otherwise negative network effects, satisfying users' preferences against exposures to certain types of content or individuals.

The dynamics of market entry barriers based on the attributes of network effects and data outshine the more innocent explanation for concentration in the digital public sphere: innovation, quality, and price. A narrative only focusing on the platforms' services would have a hard time elucidating why nascent competition fails to make inroads despite novel or superior features and considerable capital backing. Google's attempt at creating its own social media platform, Google+, provides a prime example. It failed to gain noticeable traction relative to the already established Facebook network, causing Google to eventually gut the project.[89] Where emerging hopefuls come close to challenging the core business of the incumbent platforms, the incumbents have bought up the nascent competition. Instagram falls into that category, as do countless others.[90]

Neither the presence of network effects nor the reliance on data-driven business models necessarily leads to market concentration. The level of concentration rather depends on the socio-legal framework shaping the market. Affordances of control, protections of ownership, and exclusivity play a major role, as they allow platforms to privatize the value of networks and

86. Dirk Bergemann, Alessandro Bonatti & Tan Gan, *The Economics of Social Data* (Feb. 2, 2021), https://econpapers.repec.org/paper/cwlcwldpp/2203.htm; Bruce Schneider, *The Myth of the "Transparent Society,"* WIRED (Jun. 3, 2000), https://www.wired.com/2008/03/securitymatters-0306/ ("existing power as the exponent in an equation that determines the value . . . of more information").

87. Bergemann et al., *supra* note 86.

88. Daniel McIntosh, *We Need to Talk about Data: How Digital Monopolies Arise and Why They Have Power and Influence*, 23 J. TECH. L. & POL'Y 185, 193 (2019) (identifying "positive feedback loops").

89. First Amended Complaint at 61–62, FTC v. Facebook, No. 1:20-cv-03590, Doc. 75-1 (D.D.C. Aug. 19, 2021).

90. U.S. H.R. MAJORITY STAFF, INVESTIGATION OF COMPETITION IN DIGITAL MARKETS 423–30 (2020).

data.[91] On the basis of the current socio-legal framework defining the digital economy, however, two levers of power, network effects and the characteristics of data, all but inevitably translate into elevated levels of concentration if not outright monopolization.

C. THREE DIMENSIONS OF BOTTLENECK POWER

The digital bottlenecks' levers of power extend to three dimensions: market power, political power, and cultural power. Generally, market power provides the basis for digital platforms' cultural and political influence, not least because markets are the defining organizational structure of the digital public sphere.[92]

Market power is often defined as "the ability to raise prices profitably by restricting output."[93] Monopoly power, the central condition for antitrust liability, describes the ability to raise prices substantially for a significant period—a double qualification of market power.[94] The question looming behind any assessment of market power encompasses the *potential* to act unconstrained by market forces; the actual exercise of that power remains irrelevant.[95] The notion of market power is usually tied to a relevant market, which describes the categorical and regional boundaries in which alternative offers can exert competitive pressures on the incumbents. Products and services fall into one market if they are "reasonably interchangeable" from the

91. Guggenberger, *supra* note 16.

92. *See* Khan, *supra* note 2, at 961; Marshall Steinbaum & Maurice E Stucke, *The Effective Competition Standard: A New Standard for Antitrust*, 87 U. CHI. L. REV. 595, 603 (2020).

93. Ohio v. Am. Express Co., 138 S. Ct. 2274, 2288 (2018); PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW: AN ANALYSIS OF ANTITRUST PRINCIPLES AND THEIR APPLICATION ¶ 501 (5th ed. 2020). *See* Am. Tobacco Co. v. United States, 328 U.S. 781, 811 (1946) (concerning a combination: "power exists to raise prices or to exclude competition when it is desired to do so"); United States v. Du Pont & Co., 351 U.S. 377, 391 (1956) ("the power to control prices or exclude competition"); Fortner Enterprises v. U.S. Steel, 394 U.S. 495 (1969), 394 U.S. 495, 503 (1969); Jefferson Parish Hospital Dist. No. 2 v. Hyde, 466 U.S. 2, 13–14 (1984) ("some special ability . . . to force a purchaser to do something that he would not do in a competitive market"). *See also* Eastman Kodak Co. v. Image Tech. Servs., Inc., 504 U.S. 451, 464 (1992); Thomas G. Krattenmaker, Robert H. Lande & Steven C. Salop, *Monopoly Power and Market Power in Antitrust Law*, 76 GEO. L.J. 241, 525 (1987); Richard A. Posner & William M. Landes, *Market Power in Antitrust Cases*, 94 HARV. L. REV. 937, 946 (1981).

94. AREEDA & HOVENKAMP, *supra* note 93, ¶¶ 500–501; Einer Elhauge, *Defining Better Monopolization Standards*, 56 STAN. L. REV. 253, 257–58 (2003); Daniel J. Gifford & Robert T. Kudrle, *The Law and Economics of Price Discrimination in Modern Economies: Time for Reconciliation*, 43 U.C. DAVIS L. REV. 1235, 1245 (2010).

95. *Am. Tobacco Co. v. United States*, 328 U.S. at 811.

perspective of the customer.[96] While antitrust doctrine developed tools aiming to concretize that assessment, the Supreme Court in *Cellophane* acknowledged the necessarily indefinite nature of the underlying criteria.[97] As shown above, Facebook, YouTube, Google Search, and the app store operators all possess significant leeway to act independent of market forces.[98] Despite the "actual market realities,"[99] however, none of that guarantees that courts will recognize the companies' positions as sufficient to constitute monopoly power under current antitrust doctrine.[100]

Second, consider the political dimension of digital platforms' power, resulting from their control over crucial mediums of communication.[101] Within the subcategory of communicative governance, this power includes setting and enforcing rules for communication via terms of service. January 2021 provided a remarkable demonstration of control: after a violent attack on the U.S. Capitol, Facebook and Twitter banned former President Trump from using their platforms.[102] With their unprecedented move, two companies, tightly controlled by two men, Mark Zuckerberg and Jack Dorsey, singlehandedly redefined national discourse.[103] YouTube followed suit and shut down Mr. Trump's channel.[104] By several accounts, the deplatforming

96. United States v. Du Pont & Co., 351 U.S. at 395–96 ("no more definite rule can be declared than that commodities reasonably interchangeable by consumers for the same purposes make up that 'part of the trade or commerce,' monopolization of which may be illegal.").

97. *Id.* The most common approach relies on the SSNIP test, asking whether a small, but significant increase in price by a hypothetical monopolist providing the product or service would cause customers to opt for an alternative, see Sean P. Sullivan, *Modular Market Definition*, 55 U.C. DAVIS L. REV. 1091 (2021). The price does not need to reflect a monetary payment.

98. *See* Order, Epic Games, Inc. v Apple, Inc., No. 4:20-cv-05640, Doc. 48 (N.D. Cal. 2020); Complaint, 13. Aug. 2020; Complaint, Epic, Inc. v. Google, LLC, 13. Aug. 2020 (N.D. Cal.); First Amended Complaint at 60–72, FTC v. Facebook, No. 1:20-cv-03590, Doc. 75-1 (D.D.C. Aug. 19, 2021).

99. Eastman Kodak Co. v. Image Tech. Servs., Inc., 504 U.S. 451, 466–67 (1992); Ohio v. Am. Express Co., 2018 138 S. Ct. 2274, 2285.

100. *See infra* Part III.E.

101. *See* C. EDWIN BAKER, MEDIA CONCENTRATION AND DEMOCRACY: WHY OWNERSHIP MATTERS 18 (2007) (pointing at "the 'Berlusconi' effect" enabling a candidate with no political platform to leverage his media empire).

102. Steven Levy, *A Trump Ban Is Easy. Fixing Facebook and Twitter Will Be Hard*, WIRED (Aug. 1, 2021), https://www.wired.com/story/plaintext-trump-ban-easy-fixing-facebook-twitter-hard/.

103. Prasad Krishnamurthy & Erwin Chemerinsky, *How Congress Can Prevent Big Tech from Becoming the Speech Police*, THEHILL (Feb. 18, 2021), https://thehill.com/opinion/judiciary/539341-how-congress-can-prevent-big-tech-from-becoming-the-speech-police.

104. Kari Paul, *YouTube Extends Ban on Trump amid Concerns about Further Violence*, GUARDIAN (Jan. 26, 2021), http://www.theguardian.com/us-news/2021/jan/26/youtube-trump-ban-suspension.

worked[105]—at least in the short run. Disinformation related to the election immediately plummeted on mainstream platforms. While fringe platforms did experience increased popularity, they were unable to match Facebook and Twitter's reach.

Numerous other examples paint the same picture of centralized political power over discourse. Facebook, YouTube, and Twitter have inhabited central roles during recent social movements, including the Arab Spring, #MeToo, and the BlackLivesMatter protests for social justice.[106] They successfully slowed the spread of the *New York Post*'s story on Hunter Biden in the lead-up to the 2020 Presidential election.[107] Facebook's voter drive campaigns have significant impacts on voter turnout[108]—especially in competitive elections. Facebook also relies on its reach to directly exert political power. Recent reporting revealed that Mark Zuckerberg signed off on "Project Amplify," an attempt "to show people positive stories about the social network" in their newsfeeds.[109] It remains to be seen whether the campaign improves the company's image. Regardless, Meta's executives presumably deemed the potential public backlash against the company's self-promotion worthwhile considering the campaign's promise.

Third and finally, digital bottlenecks wield cultural power. This actual and alleged cultural power represents one of the most contested and criticized aspects of platforms' role in discourse. Allegations of viewpoint bias in moderation practices and content amplification have become commonplace. While anti-conservative bias is not proven and right-wing commentators

105. Adrian Rauchfleisch & Jonas Kaiser, Deplatforming the Far-Right: An Analysis of YouTube and BitChute (Jun. 15, 2021), https://papers.ssrn.com/abstract=3867818.

106. TUFEKCI, TWITTER AND TEAR GAS, *supra* note 1, at 118–26; Jonathan M. Cox, *The Source of a Movement: Making the Case for Social Media as an Informational Source Using Black Lives Matter*, 40 ETHNIC AND RACIAL STUDIES 1847, 1852 (2017) ("[the] majority of the students in the study indicated that they got their 'facts' about the BLM movement from social media"); Miller et al., *supra* note 33, at 251; Marcia Mundt, Karen Ross & Charla M. Burnett, *Scaling Social Movements Through Social Media: The Case of Black Lives Matter*, 4 SOC. MEDIA + SOC'Y 1 (2018).

107. Elizabeth Dwoskin, *Facebook and Twitter Take Unusual Steps to Limit Spread of New York Post Story*, WASH. POST (Oct. 15, 2020), https://www.washingtonpost.com/technology/2020/10/15/facebook-twitter-hunter-biden/.

108. Niraj Chokshi, *Facebook Helped Drive a Voter Registration Surge, Election Officials Say*, N.Y. TIMES (Oct. 12, 2016), https://www.nytimes.com/2016/10/13/us/politics/facebook-helped-drive-a-voter-registration-surge-election-officials-say.html.

109. Ryan Mac & Sheera Frenkel, *No More Apologies: Inside Facebook's Push to Defend Its Image*, N.Y. TIMES (Sept. 21, 2021), https://www.nytimes.com/2021/09/21/technology/zuckerberg-facebook-project-amplify.html.

dominate charts of Facebook's most viewed contributions,[110] it is also clear that a universal platform that curates content cannot be neutral in a general sense.[111] After all, any admission and ranking of content involves evaluations of content.

The dominant platforms define many social norms of communication, providing incubators for cultural trends and movements.[112] Admittedly, some of these norms, like the prohibition of nudity and certain types of harassment, mirror preexisting social norms. But as new media has matured, the new norms have become more than just a replica of their offline ancestors. Facebook's community standards directly frame what can be said, how it can be said, and what exposure that content receives. Instagram has enabled an entirely new profession, that of the *influencer*. YouTube's algorithm, its compensation scheme, and moderation practices forge incentive structures for troves of artists and entertainers.

The ability to drive cultural developments through design choices is a form of cultural power. As danah boyd explains, architectural choices matter for deliberation, drawing a parallel to seating arrangements in classrooms.[113] These design choices may consist of features, like Instagram's filters or YouTube's recommendation algorithm. Given the scale of the incumbent platforms, small changes in the architecture can influence entire patterns of human behavior, knowledge, and expectations, which reverberate in a society's cultural downstream. Moreover, the medium itself shapes content, as Neil Postman shows regarding television.[114] Even where impulses come from individual users and are adopted in a bottom-up fashion,[115] users ultimately lack power to determine their implementation.

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110. Miles Parks, *Outrage As A Business Model: How Ben Shapiro Is Using Facebook To Build An Empire*, NPR (July 19, 2021), https://www.npr.org/2021/07/19/1013793067/outrage-as-a-business-model-how-ben-shapiro-is-using-facebook-to-build-an-empire.

111. Anupam Chander & Vivek Krishnamurthy, *The Myth of Platform Neutrality*, 2 GEO. L. TECH. REV. 400 (2018).

112. *See* Amy Adler & Jeanne C. Fromer, *Memes on Memes and the New Creativity*, 97 N.Y.U. L. REV. 453, 478 (2022) (discussing "memes as paradigmatic of contemporary cultural expression").

113. DANAH BOYD, IT'S COMPLICATED: THE SOCIAL LIVES OF NETWORKED TEENS 10 (2014).

114. NEIL POSTMAN, AMUSING OURSELVES TO DEATH: PUBLIC DISCOURSE IN THE AGE OF SHOW BUSINESS 7–10, 46–59, 76, 144–45 (1985). *See also* MARSHALL MCLUHAN, UNDERSTANDING MEDIA: THE EXTENSIONS OF MAN 7–21 (1994).

115. The now notorious use of hashtags to organize information, for example, was introduced by Chris Messina, as a lone user suggestion. Twitter, meanwhile, had insisted, "These things are for nerds. They're never going to catch on," before eventually adopting the technique. Elana Zak, *How Twitter's Hashtag Came to Be*, WALL ST. J. (Oct. 3, 2013), https://www.wsj.com/articles/BL-DGB-29742.

In sum, incumbent platforms benefit from two levers of power—network effects and data—that confer market power, political power, and cultural power. The most prominent transmission of that power is witnessed in platform design, content management, and content moderation.

III. MONOPOLY HARM AND CONTENT MODERATIONS' SYSTEMIC SHORTCOMINGS

Digital monopolies cause dysfunction in the digital public sphere. They undermine cultural and democratic discourse and hurt stakeholders. I address a selection of monopoly harms in the following sections.

A. THREATS TO PUBLIC DISCOURSE

Digital monopolies threaten functional discourse as a means of political and cultural self-governance and of exercising personal liberty, autonomy, and agency. First, and most importantly, individual content moderation decisions are inherently prone to errors,[116] and monopolistic structures amplify the errors' salience. In essence, the platforms' dominant positions raise the stakes of every individual content moderation decision. Whether humans or machines ultimately moderate online content, they are inherently fallible.[117] Each might miss context, misidentify clues, or simply misjudge content, as they have done in the past.[118] Entrusting monopolies with assessments of information on an unlimited array of subjects and across myriad nuances can transform minute errors into systemic failures. Moreover, quality content moderation does not scale as well as the rest of the network. While platforms try to outsource the process to machine-learning algorithms,[119] only human

116. douek, *supra* note 5. *See, e.g.*, Alex Heath, *A Facebook Bug Led to Increased Views of Harmful Content over Six Months*, VERGE (May 31, 2022), https://www.theverge.com/2022/3/31/23004326/facebook-news-feed-downranking-integrity-bug?s=09 ("Instead of suppressing posts from repeat misinformation offenders that were reviewed by the company's network of outside fact-checkers, the News Feed was instead giving the posts distribution, spiking views by as much as 30 percent globally.").

117. douek, *supra* note 5, at 792 ("It is not just hard to get content moderation right at this scale; it is impossible."); James Grimmelmann, *To Err Is Platform*, KNIGHT FIRST AMEND. INST. (Apr. 6, 2018), https://knightcolumbia.org/content/err-platform ("Platforms make mistakes about which user-generated content is legal.").

118. *E.g.*, Mark Scott & Mike Isaac, *Facebook Restores Iconic Vietnam War Photo It Censored for Nudity*, N.Y. TIMES (Sep. 9, 2016), https://www.nytimes.com/2016/09/10/technology/facebook-vietnam-war-photo-nudity.html.

119. Lisa Parks, *Dirty Data: Content Moderation, Regulatory Outsourcing, and The Cleaners*, 73 FILM Q. 11, 12 (2019).

moderators can offer sub-surface awareness of culture, humor, irony, and language that quality content moderation requires.[120]

Former President Trump's ban from social media might be the most well-known example of an individual moderation decision with extreme salience. In a catch-22 whirlwind, Facebook handed off responsibility for articulating a rationale for the indefinite ban to its Oversight Board, which, in turn, requested that Facebook revisit the case within two years and establish clearer guidelines to site bans.[121] Other world leaders, like German Chancellor Angela Merkel and UK Prime Minister Boris Johnson, articulated their concerns about the ban,[122] while condemning President Trump's incitement of insurrection.[123] World leaders' unease with the decision focused on the character of the decision-making entities as private monopolies. Indeed, it is important to distinguish different dimensions of the decision: the choice to ban the President, the decision-making mechanism of the platforms, and the platforms' position in the marketplace. On substance, there are good arguments to deny any head of state or government a private digital megaphone through which they can amplify misinformation or stoke public rage and political violence. These arguments may be borne out of concern for the integrity of democratic institutions or reflect anticipated user preferences not to be exposed to this kind of content. Leaving such decisions to two tightly controlled corporations, however, places too much trust in too few hands.

January 2021 provided another example of digital platforms'[124] outsized power in public discourse: Apple and Google removed Parler, a social media platform (in)famous for its right-wing conspiratorial content, from their app stores due to insufficient content moderation in the wake of the storming of the U.S. Capitol.[125] Apple and Google's concerted banning of Parler effectively shut the social network down. Even as Parler eventually secured subpar web

120. Cambridge Consultants, *Use of AI in Online Content Moderation*, OFCOM 5–6 (July 18, 2019), https://www.ofcom.org.uk/research-and-data/internet-and-on-demand-research/online-content-moderation.

121. Former President Trump's suspension, 2021-001-FB-FBR, OVERSIGHT BOARD, https://www.oversightboard.com/decision/FB-691QAMHJ.

122. Charlie Cooper, *Johnson Urges Social Media 'Debate' after Trump Twitter Ban*, POLITICO (Jan. 13, 2021), https://www.politico.eu/article/boris-johnson-urges-social-media-debate-after-trump-twitter-ban/.

123. *Capitol Riots: Boris Johnson Condemns Donald Trump for Sparking Events*, BBC NEWS (Jan. 7, 2021), https://www.bbc.com/news/uk-politics-55580806.

124. Julie E. Cohen, *Law for the Platform Economy*, 51 U.C. DAVIS L. REV. 133, 143 (2017) ("Platforms represent infrastructure-based strategies for introducing friction into networks.").

125. Jack Nicas, *Parler Pitched Itself as Twitter Without Rules. Not Anymore, Apple and Google Said.*, N.Y. TIMES (Jan. 9, 2021), https://www.nytimes.com/2021/01/08/technology/parler-apple-google.html.

hosting services for its website from a fringe provider,[126] it has remained severely limited without access to the app stores. The unilateral decisions of two companies redefined the affordances of the digital public sphere. One might, with good reason, disapprove of Parler, its content, or its users. However, two men, Sundar Pichai and Tim Cook, effectively determining the fate of an entire communication ecosystem is indicative of immense concentration of unaccountable power over public discourse[127] and places outsized trust in the infallibility and integrity of too few individuals.

Second, the monopolized digital public sphere results in regulatory, architectural, and algorithmic monocultures, susceptible to systemic failures.[128] Regardless of malicious intent, central control of discourse by a handful of digital platforms introduces fragility and vulnerability into democratic processes. Consider the flaws in Facebook's architecture that allowed for widespread election interference in the 2016 U.S. Presidential election. Foreign agents, domestic interest groups, campaigns, and profit-seeking teenagers exploited Facebook's algorithms, leading to rampant misinformation.[129] While Facebook has since addressed some of the architectural flaws,[130] the 2020 Presidential election again saw misinformation campaigns facilitated by Facebook's reach and targeting options.[131] Private regulatory monoculture further contributes to systemic fragility. When one platform controls a bottleneck of discourse through its terms of service, any conceptual flaws in that framework create systemic repercussions. The size of the platform

126. Parler contracted with "Epik, a registrar known for providing a haven to 'deplatformed' far-right-friendly sites" after it had been suspended by Amazon Web Services. Adi Robertson, *Parler is Back Online after a Month of Downtime*, VERGE (Feb. 15, 2021), https://www.theverge.com/2021/2/15/22284036/parler-social-network-relaunch-new-hosting.

127. *See* Krishnamurthy & Chemerinsky, *supra* note 103 (discussing the ban of then President Trump); Kevin Roose, *In Pulling Trump's Megaphone, Twitter Shows Where Power Now Lies*, N.Y. TIMES (Jan. 9, 2021), https://www.nytimes.com/2021/01/09/technology/trump-twitter-ban.html; Eugene Volokh, *Treating Social Media Platforms Like Common Carriers?*, 1 J. FREE SPEECH L. 377, 392 (2021).

128. Dan Geer, Rebecca Bace, Peter Gutmann, Perry Metzger, Charles P. Pfleeger, John S. Quarterman & Bruce Schneier, *CyberInsecurity: The Cost of Monopoly* (2003), https://cryptome.org/cyberinsecurity.htm; Khan, *supra* note 45, at 1073–74.

129. SELECT COMMITTEE ON INTELLIGENCE, *supra* note 8; Confessore, *supra* note 8; Subramanian, *supra* note 8; Rosenberg et al., *supra* note 8. *See also* Heath, *supra* note 116.

130. Joseph Menn, *Exclusive: Facebook to Ban Misinformation on Voting in Upcoming U.S. Elections*, REUTERS (Oct. 16, 2018), https://www.reuters.com/article/us-facebook-election-exclusive-idUSKCN1MP2G9.

131. Davey Alba, *On Facebook, Misinformation Is More Popular Now Than in 2016*, N.Y. TIMES (Oct. 12, 2020), https://www.nytimes.com/2020/10/12/technology/on-facebook-misinformation-is-more-popular-now-than-in-2016.html; Vera Bergengruen & Billy Perrigo, *Facebook Acted Too Late to Tackle Misinformation on 2020 Election, Report Finds*, TIME (Mar. 23, 2021), https://time.com/5949210/facebook-misinformation-2020-election-report/.

amplifies potential harm, whereas pluralistic arrangements could serve as hedges and circuit-breakers.

Third, market concentration invites governments to instrumentalize platforms for surveillance and suppression as extended bureaucracies,[132] or as megaphones for propaganda.[133] Centralized private control eases enforcement of state interests. It provides the state with one counterparty and allows government to leverage the reach of the platform. Take the Trump Administration's attempt to bully social media platforms into abstaining from labeling false information, for example. Its potential impact hinged on concentrated markets. While the authoritarian maneuver of tying threats of regulatory changes to demands for ongoing amplification of propaganda failed, a subsequent administration might show more competence. A future administration's deliberately "selective antitrust enforcement"[134] could serve as a vehicle to force platforms' political collaboration.

The instrumentalization of platforms is part of a broader phenomenon that Jack Balkin calls "New School Speech Regulation."[135] In contrast to the dominant 20th-century approach of direct state imperatives on discourse, New School Speech Regulation is characterized by three features: "collateral censorship," "public/private cooperation or cooptation," and "private governance by infrastructure owners."[136] The European Right to be

132. Jack M. Balkin, *Free Speech in the Algorithmic Society: Big Data, Private Governance, and New School Speech Regulation*, 51 U.C. DAVIS L. REV. 1149, 1180–81 (2018) ("Companies like YouTube and Facebook, for example, have created algorithms and policies that decide what is posted or taken down. They have also created private bureaucracies to govern their end-user communities in the interests of the community [and the company's profits]. As these technical abilities and bureaucracies develop, they are subject to cooptation by states; indeed, these bureaucracies develop in part in response to pressure and complaints by states.") (footnotes omitted); Hannah Bloch-Wehba, *Content Moderation as Surveillance*, 36 BERKELEY TECH. L.J. 1297, 1303–31 (2022) (detailing the ways in which policing influences platforms and platforms influence policing); Sangeeta Mahapatra, *Digital Surveillance and the Threat to Civil Liberties in India*, GERMAN INST. FOR GLOB. & AREA STUD. (2021), https://www.giga-hamburg.de/en/publications/24697659-digital-surveillance-threat-civil-liberties-india/.

133. *See* Muyi Xiao, Paul Mozur & Gray Beltran, *Buying Influence: How China Manipulates Facebook and Twitter*, N.Y. TIMES (Dec. 20, 2021), https://www.nytimes.com/interactive/2021/12/20/technology/china-facebook-twitter-influence-manipulation.html.

134. *See* Darrell M. West & Nicol Turner-Lee, *What to Expect from a Second Trump-Pence Term on Regulation, Antitrust, Online Hate, and China*, BROOKINGS (Aug. 28, 2020), https://www.brookings.edu/blog/techtank/2020/08/28/what-to-expect-from-a-second-trump-pence-term-on-regulation-antitrust-online-hate-and-china/ (expecting "selective antitrust enforcement" from a second Trump term).

135. Balkin, *Free Speech is a Triangle*, *supra* note 1, at 2015–21; Balkin, *supra* note 132, at 1172–82.

136. Balkin, *supra* note 132, at 1175–76; Balkin, *Free Speech is a Triangle*, *supra* note 1, at 2015.

Forgotten[137] and the German Network Enforcement Act ("NetzDG"),[138] the latter of which defines procedures that social media platforms must implement to take down illegal content, fall into that category.[139] Both regulatory regimes bank on concentrated markets, with problematic consequences for civil liberties. They tend to cause collateral censorship and "raise[] many of the same problems as prior restraint."[140]

Especially where the platforms' interests are aligned with state demands for surveillance or suppression, it is likely futile to hope they will use their market, political, or cultural power to balance overreaching governments.[141] It comes as little surprise that up until recently, none of the platforms within the scope of NetzDG challenged the law in court, despite reasonable expectations of success and users' lack of standing.[142] While some considered taking legal action against NetzDG when it was originally passed, they ultimately refrained for political reasons. Recently, Alphabet became the first to sue, however, its complaint remained limited to newly added amendments to the law, which required platforms to share user data and further information pertaining to certain takedown decisions with law enforcement agencies.[143] Overall, the concentrated structures invite cooperation with and cooptation by the state, while providing insufficient assurances that the platforms utilize their power in the best interest of their users' civil liberties.

Fourth, concentrated private control is incompatible with democratic conceptualizations of public discourse.[144] It exacerbates the threat of bad actors, and undermines the role of the media as a check on power. As network effects quash users' threat to exit, users also lose say in the definition of the

137. Case C-131/12, Google Spain SL v. Agencia Española de Protección de Datos, 2014 ECLI:EU:C:2014:317. *See also* Post, *supra* note 66.

138. Nikolas Guggenberger, *Das Netzwerkdurchsetzungsgesetz in Der Anwendung [The Network Enforcement Act in Practice]*, 70 NJW 2577 (2017); Nikolas Guggenberger, *Das Netzwerkdurchsetzungsgesetz – Schön Gedacht, Schlecht Gemacht [The Network Enforcement Act – Well Intended, Poorly Done]*, 50 ZRP 98 (2017).

139. Balkin, *Free Speech is a Triangle*, *supra* note 1, at 2029–32.

140. *Id.* at 2016.

141. *But see* Nicole Perlroth, *Apple Sues Israeli Spyware Maker, Seeking to Block Its Access to iPhones*, N.Y. TIMES (Nov. 23, 2021), https://www.nytimes.com/2021/11/23/technology/apple-nso-group-lawsuit.html.

142. *See* NICO GIELEN, NIKOLAS GUGGENBERGER, MAXIMILIAN HEMMERT-HALSWICK, TRISTAN JULIAN TILLMANN, VERENA VOGT, CASPAR ALEXANDER WEITZ & LUCAS WERNER, NETZDG: IM ZWEIFEL GEGEN DIE MEINUNGSFREIHEIT [THE NETWORK ENFORCEMENT ACT: IN DOUBT CONTRA FREE SPEECH] (Nikolas Guggenberger ed., 2020).

143. Daniel Holznagel, *YouTube vs. das NetzDG*, VERFASSUNGSBLOG (July 27, 2021), https://verfassungsblog.de/youtube-vs-netzdg/.

144. Krishnamurthy & Chemerinsky, *supra* note 103 ("That private technology platforms exert unparalleled power over political discourse is deeply undemocratic.").

digital public sphere.[145] Voice, the ability to bring about change from within an organization, provides no equivalent in the platform economy.[146] In the words of FDR's chief antitrust enforcer Thurman Arnold, "[t]he power of great organizations . . . may sometimes be exercised benevolently, but, nevertheless, it is a dictatorial power subject to no public responsibility, which is the antithesis of our democratic tradition."[147] Andrea Prat distinguishes digital media from other industries based on its "indirect effect on welfare through information externalities imposed on the policy process," and warns that, "[c]oncentration may be damaging not only because it has a direct effect on prices and quantities but also because media owners may be able to manipulate democratic decision-making."[148] And what holds for traditional media also applies to digital platforms: concentrated markets facilitate capture, which diminishes democratic accountability in the political economy.[149]

Fifth, monopolies exacerbate already problematic incentive structures resulting from platforms' engagement driven business model: tolerating or even amplifying divisive content can attract user attention and stoke engagement. Elevated levels of engagement translate into prospects for more advertising dollars. Platforms, therefore, have incentives to protect divisive figures' spreading of toxic content and misinformation.[150] And because monopolists know that marginal users face enormous switching costs due to network effects, they are hardly constrained by those users' exit potential. Only when the size of a disgruntled group of users within a platform's network approaches a critical mass does that group develop a credible threat of exit or voice.[151] The incentives of the platform may then change towards accommodating the majoritarian demand for action, alluding to the advertisement revenues and engagement generated for the platform. In a hypothetical market that is not constructed atop concentrating network effects, many users would presumably have switched to other platforms earlier. Here, the average users' threat of exit is enhanced, forcing platforms to correct their business model's negative consequences.

145. *See* ALBERT O. HIRSCHMAN, EXIT, VOICE, AND LOYALTY: RESPONSES TO DECLINE IN FIRMS, ORGANIZATIONS, AND STATES 21–29 (Harvard University Press 2004).

146. *See id.* at 30–34.

147. Thurman Arnold, *An Inquiry into the Monopoly Issue*, N.Y. TIMES, (Aug. 21, 1938), https://www.nytimes.com/1938/08/21/archives/an-inquiry-into-the-monopoly-issue-thurman-arnold-holds-that.html.

148. Andrea Prat, *Media Power*, 126 J. POL. ECON. 1747, 1747 (2018).

149. Andrea Prat, *Measuring and Protecting Media Plurality in the Digital Age: A Political Economy Approach*, KNIGHT FIRST AMEND. INST. 4–7 (Aug. 20, 2020), https://knightcolumbia.org/content/measuring-and-protecting-media-plurality-in-the-digital-age.

150. *See* Horwitz, *supra* note 11.

151. Rozenshtein, *supra* note 28.

Sixth, monopolistic structures impose centrally managed homogeneity of design choices upon discourse, which limits opportunities and stifles innovation.[152] This results in a narrow paradigm for discourse, wedded to attention extraction and private surveillance. Facebook's newsfeed, features, and design choices shape American discourse. YouTube's algorithm defines our video consumption patterns. The monopoly on design choices limits the experimentation with new formats of deliberation. While large platforms constantly run A/B testing on their users to optimize the interface, one can hardly expect discrete improvements or dynamic innovation from these practices. After all, these experiments occur within the paradigm defined by the existing platform and its business model.

B. HARMS TO STAKEHOLDERS

Beyond threats to public discourse, market concentration also harms individual stakeholders. These harms can aggregate at the level of the market or society at large but remain distinct from the more normative conceptualizations of healthy discourse discussed above, as they build on the sum of individual preferences. I detail three dimensions of harm to stakeholders.

First, monopolistic platforms can restrict output to increase prices and profits, leading to worse content moderation, more advertisements, and less privacy across the board.[153] Whether they know it or not, all users enter into a barter with the online platforms. Users endure advertisements, produce content, engage others, and provide their data—either through deliberate sharing or unconscious extraction of digital traces users leave as byproducts of their online activities. In exchange, platforms provide spaces for communication, organizing information, and moderating content. To increase profits, the platforms can degrade the quality of their services, while maintaining a nominal monetary price of zero vis-à-vis end users.[154] This entails substandard content moderation and excessive advertising. Lower grade content moderation increases the risk of erroneous takedown decisions

152. *See* Mark A. Lemley & Lawrence Lessig, *The End of End-to-End: Preserving the Architecture of the Internet in the Broadband Era*, 48 UCLA L. REV. 925, 930–31 (2001) (arguing that the lack of central control unleashed innovation on the internet).

153. *See* John M. Newman, Antitrust in Attention Markets: Definition, Power, Harm (U. Miami, Rsch. Paper No. 3745839, 2021), https://papers.ssrn.com/abstract=3745839; Prat & Valletti, supra note 32.

154. *See* John M. Newman, *Antitrust in Zero-Price Markets: Applications*, WASH. U. L. REV. 49, 53–82 (2016) (discussing the application of regular market analysis principles in zero price markets); John M. Newman, *Antitrust in Zero-Price Markets: Foundations*, U. PA. L. REV. 149, 158–74 (2015).

harming speakers and viewers alike. And currently, Facebook's automated systems, for example, detect only "a low-single-digit percent" of content that violates its community standards, exposing users to toxic and violent content.[155]

Likewise, monopoly harm may materialize as "attention overcharge,"[156] an exposure to advertisements above competitive levels, which can be understood as an increase in price or degrading of quality.[157] This should not come as a surprise. Consolidation in the local radio market following the 1996 Telecommunications Act allowed for more penetration with advertisements.[158] Assessments that observe an attention oligopoly on the advertisement side of the market and a resulting output reduction in the form of less user attention for advertisers only seemingly contradict the attention overcharge of users.[159] If platforms hold monopoly positions on both sides of the two-sided markets, they can extract too much attention from users—relative to the value of the services they offer—while restricting advertisers' access to users below competitive levels.[160] At a systemic level, attention overcharge can exacerbate the side-effects of attention-driven business models, including clickbait and addictive dark patterns, which diminish the quality of public discourse overall.

A similar effect unfolds for privacy.[161] Monopoly positions allow companies to extract more data than they otherwise could, relative to the value of services they provide. As soon as Facebook had consolidated its position in the market, the company deteriorated privacy protections for users.[162] And the same mechanism that translates large quantities of data into market entry barriers—data's social dimension[163]—exacerbates the potential for privacy

155. Seetharaman et al., *supra* note 10. To illustrate the problems with video recognition, see Ryan Mac, *Facebook Apologizes After A.I. Puts 'Primates' Label on Video of Black Men*, N.Y. TIMES (Sept. 3, 2021), https://www.nytimes.com/2021/09/03/technology/facebook-ai-race-primates.html.

156. Newman, *supra* note 153, at 31–35.

157. There is a long-lasting debate on the value of advertisements to consumers. I assume here that the presence of advertisements imposes a net-cost on users.

158. Newman, *supra* note 153, at 34.

159. Prat & Valletti, *supra* note 32.

160. First Amended Complaint at 74–75, FTC v. Facebook, No. 1:20-cv-03590, Doc. 75-1 (D.D.C. Aug. 19, 2021); Prat & Valletti, *supra* note 32. *See also* Newman, *supra* note 153 at 31–35 (but rejecting the conceptualization as two-sided markets).

161. Dina Srinivasan, *The Antitrust Case Against Facebook: A Monopolist's Journey Towards Pervasive Surveillance in Spite of Consumers' Preference for Privacy*, 16 BERKELEY BUS. J. 40, 69–81 (2019).

162. *Id.*

163. *See supra* Part I.A.2.

harm. Overall, evermore intrusive surveillance can undermine personal autonomy and chill discourse participation.

Now recall that many digital platforms constitute two-sided markets. Facebook and Google provide advertisers with potential user attention; the app stores connect app developers and app users. Monopoly rent extraction can occur on both sides of the market. This means monopolistic platforms can overcharge advertisers and underpay content creators from vloggers and newspapers to app developers relative to hypothetical competitive conditions.[164] While monopoly rent extraction on the user side of digital platform can lead to lower quality of discourse, attention overcharge, and deteriorating privacy protections, it can also erode the funding base for quality content creation by professional journalists and app developers.

Second, monopolization facilitates discrimination between high-valued and low-valued user groups,[165] exacerbating inequalities in public discourse. As platforms barter with users, they can degrade their services selectively. Two factors play a role here: the users' value to the platform, and the users' ability to switch to alternatives. Celebrities and influencers create more traffic on the platform than ordinary users, and, thus, draw in more revenues from advertisers.[166] These users also tend to have an easier time switching services and inducing others to follow. Influencers tend to be more likely to frequent social circles of early adopters, which reduces the switching costs stemming from network effects. They can choose between Google's Android ecosystem and Apple's more expensive version, accessing applications exclusive to one platform.[167] Even if the high-valued users lack realistic exit options altogether, they tend to command more cultural and political influence, making an investment in their goodwill worthwhile to the platforms.[168]

The Wall Street Journal revealed that Facebook "has given millions of . . . high-profile users special treatment," expressly motivated by the celebrity

164. *See* RonNell Andersen Jones, *Litigation, Legislation, and Democracy in a Post-Newspaper America*, 68 WASH. U. L. REV. 557, 617–24 (2011) (observing shrinking financial means of newspapers).

165. Steinbaum, *supra* note 11, at 13 (describing discriminatory content moderation as evidence of market power). *See also* PHILIP M. NAPOLI, AUDIENCE ECONOMICS: MEDIA INSTITUTIONS AND THE AUDIENCE MARKETPLACE 96–111 (2003) (detailing factors defining the value of audiences to advertisers); Philip M. Napoli, *The Audience as Product, Consumer, and Producer in the Contemporary Media Marketplace*, *in* MANAGING MEDIA FIRMS AND INDUSTRIES 261, 263–66 (2016) (focusing on demographics and gender).

166. Steinbaum, *supra* note 11, at 13.

167. Lyons & Porter, *supra* note 72 (detailing how the social audio platform Clubhouse had been exclusively available on iOS for more than one year).

168. Steinbaum, *supra* note 11, at 13 (referring to "greater bargaining power vis-à-vis the platform").

users' political influence.[169] A program named XCheck exempted these users from regular content moderation rules.[170] While some of the celebrity users have been "whitelisted," others "are allowed to post rule-violating material pending Facebook employee reviews."[171] Complaints about content from high-profile users were routed "into a separate system, staffed by better-trained, full-time employees, for additional layers of review."[172] As content moderation is part of the Facebook's service, XCheck is a form of third-degree price discrimination.[173] Higher-valued groups of users receive better services.[174] Based on the same logic, subpar investments in content moderation of African American English[175] or minority foreign languages can also be understood as price discrimination.[176] The lack of transparency in the underlying barter relationship between the platform and its users mitigates the risk of public backlash.

To be sure, price discrimination may be possible to some extent in competitive markets with high fixed costs.[177] Even in the digital economy, there remains, however, a strong link between price discrimination and concentration,[178] or market power in the economic sense.[179] Concentration

169. Horwitz, *supra* note 11.

170. *Id.*

171. *Id.*

172. *Id.*

173. Steinbaum, *supra* note 11, at 13. *See* Gifford & Kudrle, *supra* note 94, at 1241–42.

174. Steinbaum, *supra* note 11, at 13. Alternatively, the practice could be interpreted as product differentiation with some users paying more for a better product.

175. Davidson et al., *supra* note 13, at 32 (finding "substantial racial bias" "in hate speech and abusive language detection datasets"); Sap et al., *supra* note 13, at 1671 ("AAE tweets are more than twice as likely to be labelled as 'offensive' or 'abusive'").

176. Alternatively, one might see different products in different language versions.

177. William J. Baumol & Daniel G. Swanson, *The New Economy and Ubiquitous Competitive Price Discrimination*, 70 ANTITRUST L.J. 661, 667 (2003) ("Just as a negatively-sloping demand curve is not necessarily valid proof of market power, prices above marginal cost do not necessarily indicate the presence of market power, particularly where scale economies are present.").

178. Jonathan B. Baker, *Competitive Price Discrimination: The Exercise of Market Power without Anticompetitive Effects*, 70 ANTITRUST L.J. 643, 644–45, 650 (2003) ("the link between price discrimination and market power is well established"). That said, the precise effects of competition on price discrimination remain highly contested. Ambarish Chandra & Mara Lederman, *Revisiting the Relationship between Competition and Price Discrimination*, 10 AM. ECON. J.: MICROECON. 190, 193 (2018) (identifying a "U-shaped relationship between competition and price decreases").

179. I am concerned with market concentration, irrespective of the qualifiers upon which antitrust doctrine relies. *See* Gifford & Kudrle, *supra* note 94, at 1243–47.

eases price discrimination, contributing to inequality in public discourse, and price discrimination facilitates the maintenance of monopoly positions.[180]

Third, monopolistic market structures can exacerbate exclusionary tendencies in the digital public sphere. The disproportionate takedowns of LGBTQ+ expression on digital platforms provide ample evidence of ongoing marginalization.[181] Facebook's position in the marketplace converts racist and sexist biases in ad delivery algorithms[182] from individual discriminatory harm into systemic exclusion. No doubt, the digital revolution has broadened participatory opportunities in discourse and created space for underrepresented voices and marginalized concerns compared to the twentieth century media landscape.[183] However, benchmarks for access and inclusion should reference today's technological possibilities and not the affordances of twentieth century media. By that metric, today's digital public sphere falls short of what pluralistic structures could provide. At least since the 1990s, digital technology has redefined costs and scarcities in the communicative process.[184] As entry barriers to participation can no longer be blamed on technology or costs, market structure becomes the decisive barrier. While the long history of race and gender-based discrimination debunks the notion that functioning markets sufficiently punish and organically eliminate such discrimination,[185] monopolized markets fare worse.

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180. Herbert Hovenkamp, *Market Power and Secondary-Line Differential Pricing*, 71 GEO. L.J. 1157, 1166–67 (1983).

181. Waldman, *supra* note 12 ("nonnormative and LGBTQ+ sexual expression is disproportionately taken down, restricted, and banned."). *See also* Albert & Rigot, *supra* note 12.

182. *See* Muhammad Ali, Piotr Sapiezynski, Miranda Bogen, Aleksandra Korolova, Alan Mislove & Aaron Rieke, *Discrimination through Optimization: How Facebook's Ad Delivery Can Lead to Biased Outcomes*, 3 PROCEEDINGS OF THE ACM ON HUMAN-COMPUTER INTERACTION 1 (2019); Haan, *supra* note 62, at 656–58; Jinyan Zang, *How Facebook's Advertising Algorithms Can Discriminate By Race and Ethnicity*, TECH. SCI. (Oct. 19, 2021), https://techscience.org/a/2021101901/. On the financial and exclusionary harm of algorithmic bias more generally, see Jane Chung, *Racism In, Racism Out*, Public Citizen (2021).

183. Miller et al., *supra* note 33, at 248, 250–52 (describing social media as "additional outlet for coping with the negative effects of racial discrimination"). *See* Leonard M. Baynes, *White Out: The Absence and Stereotyping of People of Color by the Broadcast Networks in Prime Time Entertainment Programming*, 45 ARIZ. L. REV. 293 (2003); Froomkin, *supra* note 28, at 805–07 (detailing the male dominance in internet governing bodies).

184. Richard L. Hasen, *Cheap Speech and What It Has Done (To American Democracy)*, 16 FIRST AMEN. L. REV. 200 (2018); Eugene Volokh, *Cheap Speech and What It Will Do*, 104 YALE L.J. 1808 (1995).

185. *See* MILTON FRIEDMAN, CAPITALISM AND FREEDOM 108–18 (University of Chicago Press 40th anniversary ed. 2002).

C. ANTITRUST DOCTRINE'S COMPENSATORY FAILURE

Contemporary antitrust doctrine fails to compensate for the concentrating effects in the digital economy, and thus to mitigate monopoly harm. This omission, in turn, contributes to the legal construction of digital monopolies. Since the 1970s, courts and the Department of Justice have become increasingly lenient toward mergers.[186] Unilateral conduct faced decreasing scrutiny until the recent lawsuits against Facebook and Google.[187] But even if these lawsuits prove successful, without a broader shift in the current antitrust paradigm, enforcement actions alone will not effectuate pluralistic discourse. Antitrust doctrine fails to offset the concentrating effects for three main reasons.

The first source of failure is contemporary antitrust law's exclusive spotlight on consumer welfare effects,[188] which tolerates significant levels of concentration.[189] The Supreme Court has long embraced a purely efficiency-centered approach over protecting "diffused industry structures"—despite indications of Congressional intent to the contrary when passing the Sherman Act.[190] When the Court recently articulated the grounding of antitrust law in

186. Mark Glick, Catherine Ruetschlin & Darren Bush, *Big Tech's Buying Spree and the Failed Ideology of Competition Law*, 72 U.C. HASTINGS L.J. 465, 505–06 (2021).

187. *See* Complaint, United States v. Google, LLC, No. 1:20-cv-03010-APM, Doc. 1 (D. D.C. Oct. 20, 2020); Complaint, Texas v. Google, LLC, No. 4:20-cv-00957 (E.D. Tex. Dec. 16, 2020); Complaint, FTC v. Facebook, No. 1:20-cv-03590, Doc. 3 (Dec. 9, 2020); Memorandum Opinion, No. 1:20-cv-03590, Doc. 73 (D.D.C. 2021); *see also* Jonathan B. Baker, *The Case for Antitrust Enforcement*, 17 J. ECON. PERSP. 27, 33–35 (2003) (observing that "[t]he antitrust enforcement agencies pursue relatively few monopolization cases at any given time"); William E. Kovacic, *Designing Antitrust Remedies for Dominant Firm Misconduct*, 31 1285, 1287–88 n.23 (1999) (providing an account of monopolization case brought by federal antitrust agencies over time); Steinbaum & Stucke, *supra* note 92, at 599; Fiona Scott Morton, *Modern U.S. Antitrust Theory and Evidence amid Rising Concerns of Market Power and Its Effects: An Overview of Recent Academic Literature*, EQUITABLE GROWTH 6 (2019), http://www.equitablegrowth.org/research-paper/modern-u-s-antitrust-theory-and-evidence-amid-rising-concerns-of-market-power-and-its-effects/.

188. *See* BORK, *supra* note 82, at 51 (expressly urging to focus on consumer welfare, but, on substance, conflating consumer welfare with total welfare).

189. WILLIAM N. ESKRIDGE & JOHN A. FEREJOHN, A REPUBLIC OF STATUTES: THE NEW AMERICAN CONSTITUTION 121 (2010); Prat, *supra* note 149, at 9. *See also* BAKER, *supra* note 101, at 56–60; BENJAMIN M. COMPAINE & DOUGLAS GOMERY, WHO OWNS THE MEDIA? COMPETITION AND CONCENTRATION IN THE MASS MEDIA INDUSTRY 547 (3d ed. 2000) (distinguishing between the "conventional antitrust standard" and the "sociopolitical standard," but arguing that the former is meant to promote the latter).

190. ESKRIDGE & FEREJOHN, *supra* note 189, at 121, 126–27; Eleanor M. Fox, *Modernization of Antitrust: A New Equilibrium*, 66 CORNELL L. REV. 1140, 1146–55, 1182 (1981); Maurice E. Stucke, *Reconsidering Antitrust's Goals*, 53 B.C. L. REV. 551, 559–62 (2012); Sandeep Vaheesan, *The Profound Nonsense of Consumer Welfare Antitrust*, 64 ANTITRUST BULL. 479, 480–

"the theory that market forces 'yield the best allocation' of the Nation's resources" in *NCAA v. Alston*,[191] it omitted recognizing any function in service of democracy as emphasized in earlier precedents.[192] Efficiency and pluralism, however, are neither interchangeable nor necessarily correlated.[193]

Myriad nuances complicate the picture, including distinctions between consumer welfare and total welfare, where the latter considers the economic effects on society at large, resulting in more regressive distributions of surplus.[194] And in practice, the application of the consumer welfare standard can be murky. In *Ohio v. American Express*, for example, the Court reviewed and upheld the credit card company's provisions prohibiting merchants from trying to steer customers to credit cards with lower transaction fees.[195] But in doing so, the Court neglected the harmful effects on cash-paying customers, who inevitably cross-subsidized the card company's loyalty program.

Second, the levels of concentration necessary to trigger antitrust scrutiny far exceed those of a market conducive to pluralistic discourse. There are two main paths to establish monopoly power. One approach relies on proxies, where market share provides the central parameter.[196] Courts have provided various accounts as to when they consider market shares to indicate monopoly power.[197] Writing for the Second Circuit in 1945, Judge Hand posited that a market share of over ninety percent "is enough to constitute a monopoly; it is doubtful whether sixty or sixty-four percent would be enough; and certainly

84 (2019). *But see* Robert H. Bork, *Legislative Intent and the Policy of the Sherman Act*, 9 J.L. & ECON. 7, 48 (1966) (erroneously arguing the legislative intent behind the Sherman Act was limited to consumer welfare concerns).

191. NCAA v. Alston, No. 20-512, slip op. at 5 (U.S. Jun. 21, 2021) (citing NCAA v. Board of Regents of the Univ. of Okla., 468 U.S. 85, 104, n.27 (1984)).

192. NCAA v. Board of Regents of the Univ. of Okla., 468 U.S. 85, 104 n.27; N. Pac. Ry. Co. v. United States, 356 U.S. 1, 4 (1958); @johnmarknewman, TWITTER (June 21, 2021, 9:01 AM), https://web.archive.org/web/20210622054605/https://twitter.com/johnmarknewman/status/1407005889798709254.

193. Prat, *supra* note 149, at 9–10.

194. Total wealth is more unequally distributed than consumption. *See* Board of Governors of the Federal Reserve System (US), *Distribution of Household Wealth in the U.S. since 1989*, FED. RSRV., https://www.federalreserve.gov/releases/z1/dataviz/dfa/distribute/chart/#quarter:121;series:Corporate%20equities%20and%20mutual%20fund%20shares;demographic:networth;population:1,3,5,7;units:shares;range:1989.3,2021.1 (last visited Aug. 17, 2021).

195. Ohio v. Am. Express Co., 2018 138 S. Ct. 2274, 2277.

196. Eastman Kodak Co. v. Image Tech. Servs., Inc., 504 U.S. 451, 464 (1992); Elhauge, *supra* note 94, at 259–60.

197. United States v. Aluminum Co. of Am., 148 F.2d 416, 424 (2nd Cir. 1945); AREEDA & HOVENKAMP, *supra* note 93, ¶ 532.

thirty-three per cent is not."[198] The Supreme Court adopted Judge Hand's analysis, citing the ninety figure as a clear indicator of monopoly power.[199]

The adopted framework still stands today.[200] In *Kolon*, for example, the Fourth Circuit stipulated, "the Supreme Court has never found a party with less than 75% market share to have monopoly power," before proceeding to rely on other precedent that locates the lower boundary at 70 percent.[201] Philip Areeda and Herbert Hovenkamp consider it "rare indeed to find that a firm with half of a market could individually control price over any significant period" and "presume[s] that market shares below 50 or 60 percent do not constitute monopoly power."[202] Additional metrics may complement the picture to heighten or lower the minimum market shares.[203] The point is that high thresholds preventing antitrust enforcement where only two platforms divide the market can hardly guarantee a pluralistic environment conducive to democratic discourse. The second approach infers monopoly power from actual behaviors that would not have been possible absent monopoly power—direct evidence for monopoly harm.[204] But in *American Express*, the Supreme Court all but foreclosed this route.[205]

Third, antitrust doctrine "requires proof of both power and 'exclusionary' or anticompetitive conduct before any kind of relief is appropriate."[206] Many of the troubling developments in the digital public sphere, however, lack direct links to such conduct. General antitrust doctrine takes no issue with market monopolization "from growth or development as a consequence of a superior product, business acumen, or historic accident."[207] As currently understood,

198. United States v. Aluminum Co. of Am., 148 F.2d at 424. *See also* U.S. DEP'T OF JUSTICE, COMPETITION AND MONOPOLY: SINGLE-FIRM CONDUCT UNDER SECTION 2 OF THE SHERMAN ACT, 21 (2008), https://www.justice.gov/sites/default/files/atr/legacy/2009/05/11/236681.pdf (withdrawn).

199. Am. Tobacco Co. v. United States, 328 U.S. 781, 814 (1946) (citing United States v. Aluminum Co. of Am., 148 F.2d 416, 429 (2nd Cir. 1945)).

200. U.S. DEP'T OF JUSTICE, *supra* note 198, at 21–22; AREEDA & HOVENKAMP, *supra* note 93, ¶ 532a-c.

201. Kolon Indus. Inc. v. E.I. DuPont de Nemours & Co., 748 F.3d 160, 174 (4th Cir. 2014) (citing E.I. du Pont de Nemours & Co. v. Kolon Indus., Inc., 637 F.3d 435, 450 (4th Cir. 2011)). *See also* White Bag Co. v. Int'l Paper Co., 579 F.2d 1384, 1387 (4th Cir.).

202. AREEDA & HOVENKAMP, *supra* note 93, at 532c.

203. *Id.* ¶ 532. *See* Darren Bush & Salvatore Massa, *Rethinking the Potential Competition Doctrine*, 2004 WIS. L. REV. 1035, 1043–1126 (2004) (detailing the role of potential competition in antitrust doctrine).

204. Ohio v. Am. Express Co., 2018 138 S. Ct. 2274, 2284–85.

205. *See id.*

206. AREEDA & HOVENKAMP, *supra* note 93, ¶ 650a. *See* Donald F. Turner, *Antitrust Policy and the Cellophane Case*, 70 HARV. L. REV. 281, 282 (1956).

207. United States v. Grinnell Corp., 384 U.S. 563, 570–71 (1966).

antitrust is not strictly antimonopoly; it only limits behaviors that protect or expand a monopoly position. In *Trinko*, the Supreme Court reiterated this understanding by praising Schumpeterian cycles of monopolization "and the concomitant charging of monopoly prices, [as] not only not unlawful; it is an important element of the free-market system."[208] Implicit in the Court's determination is that the market will self-correct in the absence of condemned behavior—despite indicators to the contrary.[209]

Historically, courts have recognized few exceptions to the general requirement of specific conduct. The essential facilities doctrine, a subcategory of antitrust-based duties to deal, provides one example of this rare species. The doctrine provides competitors with access rights to facilities controlled by monopolists to the extent that these competitors depend on those facilities and cannot reasonably duplicate them.[210] In *Trinko*, however, the Supreme Court all but closed the door on antitrust-based access rights.[211]

Antitrust lacks a legal sunset mechanism for monopoly rent extraction, which is taken for granted where exclusive rights incentivize innovation.[212] In the absence of specific exclusionary or anticompetitive conduct, courts generally take no issue with a market's limitation to a single social media provider, a single video sharing platform, a single search engine, or a single app store controlling access to discourse. In contrast to the relevant EU standard of abuse control, even unified central control over the entire digital public sphere and extracting monopoly rents would not trigger antitrust scrutiny of unilateral conduct.[213] Despite its legal and policy underpinning, so-called "organic growth" leading to market monopolization remains unaddressed, notwithstanding its equivalent impact on the governance of discourse.[214] For the digital public sphere, however, there are no good monopolies.[215]

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208. Verizon Commc'ns Inc. v. L. Offs. of Curtis V. Trinko, LLP, 540 U.S. 398, 407 (2004) (concluding that "possession of monopoly power will not be found unlawful unless it is accompanied by an element of anticompetitive conduct.").

209. *See supra* Part I.B.

210. MCI Commc'ns Corp. v. Am. Tel. & Tel. Co., 708 F.2d 1081, 1132–33 (7th Cir. 1983); Guggenberger, *The Essential Facilities Doctrine in the Digital Economy: Dispelling Persistent Myths*, *supra* note 67, at 303, 307–8; Sandeep Vaheesan, *Reviving an Epithet: A New Way Forward for the Essential Facilities Doctrine*, 2010 UTAH L. REV. 911, 911 (2010).

211. *Trinko*, 540 U.S. at 412.

212. Guggenberger, *supra* note 79, at 306–14; Turner, *supra* note 20, at 1219–20.

213. *See* Phillip Areeda, *Essential Facilities: An Epithet in Need of Limiting Principles*, 58 ANTITRUST L.J. 841, 846–47 (1989).

214. *See* Turner, *supra* note 20, at 1219–20 (demonstrating equivalent results, irrespective of the original source of monopoly).

215. *See* Edward S. Mason, *Monopoly in Law and Economics*, 47 YALE L.J. 34, 34 (1937) (stressing antitrust doctrine's focus on "'bad' trusts").

The standard differs for mergers, as the act of merging itself provides a trigger for antitrust scrutiny. The criteria leading to the blocking of a merger centers on structural considerations and potential future impact on competition, "where . . . the effect . . . may be substantially to lessen competition, or to tend to create a monopoly."[216] Merger control can provide a powerful instrument contributing to open markets. Currently though, many of the most problematic acquisitions cluster just under the relevant value threshold for FTC notification.[217] And even where acquirers do not directly stifle innovation, the lack of alternative exit strategies for start-ups worsens the monopoly problem and hampers technology diffusion.[218]

IV. REFRAMING THE DIGITAL PUBLIC SPHERE

Cultural and political democracy rests on a basic level[219] of pluralism—that is, a system reliant upon a diverse array of actors, while controlling the effects of factions.[220] Justice Black perfectly captures the value of pluralistic discourse in *Associated Press* when he identifies "the widest possible dissemination of information from diverse and antagonistic sources [as] essential to the welfare of the public." [221] This understanding arguably holds regardless of the underlying theory of free speech—cultural or political self-governance, protection of speakers or listeners, or knowledge creation.

In the 1960s and '70s, the Federal Communications Commission (FCC) applied the pluralistic ideal to broadcasting, invoking "the maximum diversity of ownership that technology permits in each area" as a policy goal.[222] Today,

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216. 15 U.S. Code § 18(1). *See* Glick et al., *supra* note 186, at 475–86.

217. Colleen Cunningham, Florian Ederer & Song Ma, *Killer Acquisitions*, 129 J. POL. ECON. 649, 653–54 (2020).

218. Mark A. Lemley & Andrew McCreary, *Exit Strategy*, 101 B.U. L. REV. 1, 61–66 (2021).

219. *See* Genevieve Lakier, *The Non–First Amendment Law of Freedom of Speech*, 134 HARV. L. REV. 2299, 2351–55 (2021) ("the right to freedom of speech is far more majoritarian in its operation than we usually recognize").

220. THE FEDERALIST NO. 10, *supra* note 18.

221. Associated Press v. United States, 326 U.S. 1, 20 (1945). The Supreme Court frequently relies on the metaphor of a "marketplace of ideas." *See, e.g.*, United States v. Rumely, 345 U.S. 41, 56 (1953). This conceptualization builds on Justice Holmes' dissent in *Abrams* endorsing a "free trade of ideas—that the best test of truth is the power of the thought to get itself accepted in the competition of the market." Abrams v. United States, 250 U.S. 616, 630 (1919) (Holmes, J., dissenting). Despite the inaptitude of a literal understanding of the market-metaphor, Darren Bush, *The Marketplace of Ideas: Is Judge Posner Chasing Don Quixote's Windmills*, 32 ARIZ. ST. L.J. 1107, 1109–10, 1120–44 (2000), the analogy conveys a core message of decentralized power to enable healthy discourse, *see* Stanley Ingber, *The Marketplace of Ideas: A Legitimizing Myth*, 1984 DUKE L.J. 1, 16–48 (1984).

222. *In re* Amend. of Sections 73.35, 73.240 & 73.636 of the Comm'n Rules Relating to Multiple Ownership of Standard, FM & Television Broad. Stations., 22 F.C.C.2d 306, 311

Justice Black's concern about diverse and antagonistic sources of information extends to social media, video sharing, search, and app stores.[223] These platforms all shape our exposure to knowledge and define our communicative environments.[224]

In practice, digital pluralism requires decentralized gateways to the digital public sphere instead of monopolistic bottlenecks, and a variety of communicative spaces instead of algorithmic monocultures. Distributed economic, cultural, and political power become most important where platforms immediately shape discourse via architectural choices or content moderation decisions. The following sections offer a cautious case for digital pluralism and a roadmap of policy prescriptions to help get us there.

A. THE CAUTIOUS CASE FOR DIGITAL PLURALISM

A pluralistic digital public sphere can provide the basis for open, accessible, diverse, and equitable online deliberation. It also lowers the stakes.[225] Pluralistic structures reduce the cost of errors by individuals in designing communicative ecosystems and curating content. Regardless of the market structure, content moderation remains difficult—especially in the fast-paced, low-friction environment supported by the internet. Industrial organization cannot alleviate the operators of digital platforms from tough choices and close calls. Should a platform ban a head of state or tolerate the spread of dangerous lies and misinformation? Should a nude picture be taken down? If, however, every actor retains only minimal influence over the digital public sphere, their errors will become less systemically relevant. Pluralism, therefore, hedges against unavoidable errors or malfunctions. Moreover, if content moderation decisions are inherently hard, lowering the stakes might be the best medicine available.[226] The same logic applies to design choices, whether they relate to socio-architectural environments or algorithmic tools. Likewise, application of the Madisonian principle[227] can increase the resilience of public discourse, protecting against undue state or private interference with democratic deliberation.

To be sure, open and pluralistic structures do not guarantee functional online discourse. First, although "competitive incentives are a crucial driver of

(1970). *See also* Pol'y Statement on Compar. Broad. Hearings, 1 F.C.C.2d 393, 394 (1965) ("a maximum diffusion of control"); BAKER, *supra* note 101, at 7–8.

223. *See* Balkin, *How to Regulate (and Not Regulate) Social Media*, *supra* note 1, at 78–79.

224. *Id.* at 75.

225. *See* Rozenshtein, *supra* note 28 (referring to "content moderation subsidiarity").

226. *See id.*

227. *See* THE FEDERALIST NO. 10, *supra* note 18.

ideological diversity,"[228] alternative platforms do not necessarily translate into pluralistic, quality content.[229] Odds are that competitive markets will produce more of the same, instead of a variety of affordances and arrangements.[230] Also, agreements between platforms on the handling of certain types of content may pose similar problems as unilateral monopoly positions do.[231] Yet, pluralistic communicative spaces still increase the chances of pluralistic content.[232] Online environments are arguably more conducive to sustaining diverse communication channels than legacy media. While a traditional newspaper is limited by high fixed costs and geographic constraints, digital platforms are not.

Additionally, quality content and diversity are public goods, which markets chronically underproduce.[233] Yet, there is some reason to hope that a more competitive platform market will transfer surplus to the next level up in the digital stack and support quality content production. Digital pluralism on its own will not assure the emergence of an institutional framework necessary to produce knowledge and healthy self-governance.[234] For instance, the right-wing conspiracy outlet, InfoWars, certainly contributes to a set of diverse and antagonistic sources of information, but "its goal is to destroy trust" by means of misinformation.[235] To a lesser extent, this also holds for Parler and Gettr. Only additional regulation and professional norms can fill that void and enhance public trust.[236]

Second, the dominant attention and data-based business models might continue to provide incentives detrimental to public interest. Competition can provide alternatives to addictive applications harming users' mental health.[237]

228. Matthew Gentzkow, Jesse M. Shapiro & Michael Sinkinson, *Competition and Ideological Diversity: Historical Evidence from US Newspapers*, 104 AM. ECON. REV. 3073, 3107 (2014).

229. BAKER, *supra* note 101, at 15; BORIS P. PAAL, MEDIENVIELFALT UND WETTBEWERBSRECHT 143–47 (2010).

230. *See* Andreas Heinemann, *Digitale Medien und das Kartellrecht*, *in* MEDIEN UND DIREKTE DEMOKRATIE 45, 46 (Daniel Kübler ed., 2018) (referring to the view as "holländische Schule" [Dutch School]).

231. *See* evelyn douek, *The Rise of Content Cartels*, KNIGHT FIRST AMEND. INST. (Feb. 11, 2020), https://knightcolumbia.org/content/the-rise-of-content-cartels.

232. BAKER, *supra* note 101, at 15; PAAL, *supra* note 229, at 143–47.

233. Gentzkow et al., *supra* note 228, at 3073.

234. Balkin, *How to Regulate (and Not Regulate) Social Media*, *supra* note 1, at 79–80.

235. *Id.*

236. *Id.* at 79. *See* ROBERT POST, DEMOCRACY, EXPERTISE, AND ACADEMIC FREEDOM: A FIRST AMENDMENT JURISPRUDENCE FOR THE MODERN STATE 34 (2012) (stressing the importance of "democratic competence" and "a disciplinary authority that distinguishes good ideas from bad ones").

237. James Niels Rosenquist, Fiona M. Scott Morton & Samuel N. Weinstein, *Addictive Technology and Its Implications for Antitrust Enforcement*, 100 N.C. L. REV. 431 (2022).

These alternatives would benefit many users—even though a broader range of offerings may also expose vulnerable individuals to more addictive concepts. The latter, in fact, lends itself more to a justification for regulation than as an argument in favor of monopoly structures.[238] Personalized services and dark patterns would allow for much of the same result even under monopoly conditions. Thus, monopolistic structures cannot even claim to provide a second-best in lieu of regulation.[239]

Third, when assessing the impacts of pluralism on political polarization and partisanship in discourse, the twentieth-century media landscape offers a false comparison. Any form of linear medium faces some trade-off between market coverage and alignment of its content with individual users or user groups. This provides one explanation for why many regionally monopolistic newspapers positioned themselves in the mainstream of the political spectrum, despite the market entry barriers in the newspaper business.[240] For digital platforms—specifically social media, video sharing, and online news outlets—this calculus differs.[241] Fixed start-up costs have diminished. The ability to personalize content solves the coverage and alignment trade-off limiting traditional media. Data generated because of the platforms' scope enable even more granular personalization and, thus, potential for divergent and partisan media diets. In essence, the politically moderating effects of 20th-century linear media monopolies have diminished due to technological changes. Facilitating external pluralism would not necessarily exacerbate that development.

Relatedly, consider the market structure's impact on filter bubbles and echo chambers.[242] These are mechanisms that reinforce biases and facilitate the spread of conspiracy theories via selective exposure to content. They can be based on individuals' self-sorting in line with ideological priors and

238. *See* Daniel A. Crane, *Harmful Output in the Antitrust Domain: Lessons from the Tobacco Industry*, 39 GA. L. REV. 321, 336–86 (2005) (endorsing net harm antitrust standards for harmful economic output, like tobacco products).

239. *See* Peter J. Hammer, *Antitrust beyond Competition: Market Failures, Total Welfare, and the Challenge of Intramarket Second-Best Tradeoffs*, 98 MICH. L. REV. 849, 853–63 (2000).

240. *Local Monopoly in the Daily Newspaper Industry*, 61 YALE L.J. 948, 949, 957 (1952).

241. Rebecca Tushnet, *Power without Responsibility: Intermediaries and the First Amendment*, 76 GEO. WASH. L. REV. 986, 990 (2008).

242. *See* Julie E. Cohen, *What Privacy is For*, 126 HARV. L. REV. 1904, 1917 (2013); Cohen, *supra* note 124, at 150; Philip M. Napoli & Fabienne Graf, Social Media Platforms as Public Trustees: An Approach to the Disinformation Problem 9 (TPRC48, Dec. 14, 2020), https://papers.ssrn.com/abstract=3748544 (describing the effect of market fragmentation on the spread of misinformation as "purely speculative"); Zeynep Tufekci, *"Not This One": Social Movements, the Attention Economy, and Microcelebrity Networked Activism*, 57 AM. BEHAVIORAL SCIENTIST 848, 851 (2013); Ethan Zuckerman, *The Internet's Original Sin*, ATLANTIC (Aug. 14, 2014), https://www.theatlantic.com/technology/archive/2014/08/advertising-is-the-internets-original-sin/376041/.

identities, algorithmic sorting, or simply the ease of connection online. While the contribution of these mechanisms to the dysfunction of discourse is not entirely clear, there is evidence to suggest that they exacerbate misinformation. If one accepts that premise, more fragmented markets seem problematic. After all, these mechanisms could allow for even more sorting, supercharging existing echo chambers. But leaping to this conclusion is highly questionable, as personalization of online experiences already enables sorting within *monopolistic* structures. Moreover, the ringfencing of conspiratorial content within smaller structures might be preferable to echo chambers within large networks, where spillover effects remain more likely.

Misinformation and hateful content might be harder to counter in a pluralistic market.[243] After all, no central entity, like a monopolistic platform, could take decisive central action.[244] However, betting on the benevolent private monopolists and powerful private governors of discourse to safeguard healthy discourse instead would be misguided. Monopoly power, to quote Thurman Arnold, "may sometimes be exercised benevolently, but, nevertheless, it is a dictatorial power subject to no public responsibility, which is the antithesis of our democratic tradition." Platform monopolists' and society's interests are misaligned. Content moderation policies can be changed at any point to maximize corporate profits. Trust in specific individuals is equally misplaced because people and their loyalties change. Moreover, Elon Musk's acquisition of Twitter serves as an example of how quickly control over an important platform can shift and presumably reverse Twitter's approach to hateful content. Finally, neither of the incumbent platforms has proven a record as good steward of healthy public discourse. Facebook, for example, broke ties with former President Trump only after it became obvious that he would not lead the next administration.

Fourth, market structures for pluralism have gained import as the First Amendment speech protections have shifted toward emphasizing property and corporate interests.[245] While it may be possible to construct a pluralistic public sphere on that basis, doing so requires even closer attention to market structure and asset distribution. Otherwise, the often-proclaimed nexus between market ordering and free discourse[246] loses its grounding entirely.

Overall, there are two approaches to ensuring pluralism in public discourse: (1) external pluralism through alternatives in the marketplace and (2) internal pluralism enabled by governance structures within media

243. Rozenshtein, *supra* note 28.
244. *Id.*
245. *See* Lakier, *supra* note 219, at 2351–69.
246. FRIEDMAN, *supra* note 185, at 16–19.

organizations. The former approach often takes the shape of competition in market arrangements. Public broadcasting institutions, like the BBC in the UK or their German counterparts ARD and ZDF, practice the latter. Their boards include a variety of stakeholders from government and civil society, staffed with an eye on political balance. They enjoy varying degrees of autonomy from the state. In Germany, this is enshrined as the constitutional principle of "Staatsferne." For structural, legal, and pragmatic reasons, I put more hope in the mechanisms of external pluralism as applied to the American digital public sphere.

In the U.S., the digital public sphere is almost entirely constructed as a market. The resulting structural and political path dependencies prove sticky. Establishing a BBC-style equivalent for social media, video sharing, search, or app-hosting to replace dominant private platforms remains politically unrealistic.[247] Leaving politics aside, centralized public solutions would also create "at least potential tension" with democratic concerns over decentralized ownership and control.[248] Moreover, if a government organization tried to provide the services of private platforms, it would become highly vulnerable to First Amendment challenges.[249] Industrial policy for private-sector digital pluralism, complemented by public options for digital infrastructure, offers a more promising avenue for public involvement.[250]

B. INTEROPERABILITY

To enable digital pluralism, a reform agenda must address the sources of monopoly power. Law should reallocate network effects from private corporations to the level of the market or society at large.[251] Just as several areas of law currently allocate network effects by protecting exclusivity online,[252] various legal knobs can redistribute networks' surplus. Key to that distribution is interoperability.[253] At a technical level, interoperability describes the ability of a system to exchange or compile information originating from another system. At an organizational and functional level, interoperability

247. *But see* Zuckerman, *supra* note 14, at 5–6.

248. BAKER, *supra* note 101, at 9.

249. *See* Lyrissa Barnett Lidsky, *Government Sponsored Social Media and Public Forum Doctrine Under the First Amendment: Perils and Pitfalls*, 19 PUB. LAW. 2, 5–7 (2011) (providing an account of the legal challenges stemming from public forum doctrine).

250. *See infra* Part III.C.

251. OECD, DATA PORTABILITY, INTEROPERABILITY AND DIGITAL PLATFORM COMPETITION, 19–20 (2021), http://oe.cd/dpic; Kades & Scott Morton, *supra* note 19, at 14, 33.

252. For the concept of legal allocation of network effects, see Guggenberger, *supra* note 16.

253. Kades & Scott Morton, *supra* note 19, at 14, 33.

enables cross-platform collaboration by removing technical boundaries. Figuratively, it eliminates the walls around online ecosystems.

Interoperability can take several forms. Cory Doctorow distinguishes indifferent, cooperative, and adversarial interoperability based on the interest of the incumbent in the interconnection.[254] And indeed, there are plenty of practical examples for all three categories, even for voluntary cooperation.[255] One platform might open APIs to another platform, allowing for the exchange of standardized information. This enables users to import their contacts into other applications—for instance, seeing Facebook friends on a third-party fitness or dating app. The same idea lets third-party websites include "like" and "share" buttons so that visitors of that website can directly import these websites' content into social networks and recommend it to their contacts.

The problem is that platforms will only allow others to interoperate when it is advantageous for them. They might be able to collect additional user data or increase their network effects.[256] They may also gain valuable insights into other businesses, allowing them to appropriate business models or select potential targets for acquisitions. Moreover, granting the developers access to features and data encourages experimentation, from which the underlying platform might benefit in the medium and longer term. Where there is no such expected gain, interoperability may only empower nascent competitors and destabilize the monopolists' position in the marketplace. As incumbent platforms will hardly be interested in forfeiting their dominant positions, interoperability to redistribute network effects requires mandates: legislation, regulation, or court orders. A regulator would need to set or supervise the standards and access conditions.[257]

Below, I distinguish active and passive interoperability—both in horizontal relationship between platforms.[258] Active interoperability requires collaboration from the incumbent, while passive interoperability does not. To ensure the former, the law must mandate collaboration; to induce the latter, it is sufficient to loosen protections of exclusivity online.

254. Cory Doctorow, *Interoperability: Fix the Internet, Not the Tech Companies*, ELEC. FRONTIER FOUND. (July 11, 2019), https://www.eff.org/deeplinks/2019/07/interoperability-fix-internet-not-tech-companies.

255. *Id.*

256. *See* First Amended Complaint at 4–5, 12–14, FTC v. Facebook, No. 1:20-cv-03590, Doc. 75-1 (D.D.C. Aug. 19, 2021).

257. *See* Rory Van Loo, *Rise of the Digital Regulator*, 66 DUKE L.J. 1267 (2017); Rory Van Loo, *The Missing Regulatory State: Monitoring Businesses in an Age of Surveillance*, 72 VAND. L. REV. 1563 (2019).

258. *See* OECD, *supra* note 251, at 19–20.

1. Active Interoperability

To reduce switching costs on the side of users and enable a competitive marketplace, incumbent digital platforms should be forced to interconnect by offering open APIs—at least as it relates to their basic functionalities.[259] For social media, that should entail messaging and posting across networks. Operating systems and app stores should be forced to allow sideloading of applications, resembling the 1968 FCC ruling in *Carterfone*, which broke up AT&T's grip on devices and enabled AT&T customers to connect third-party telephones.[260] The settlement in *Microsoft* likewise, forced the dominant provider of operating systems to enable interconnection between Windows and third-party software,[261] but failed to extend the same affordances to horizontal competitors in the market for operating systems.[262] Recent legislative initiatives have similarly focused on interoperability. In 2019, Sen. Mark R. Warner sponsored the Augmenting Compatibility and Competition by Enabling Service Switching Act of 2019; and in June 2021, Rep. Mary Gay Scanlon introduced a renewed version of that approach in the House.[263] The bills would entrust the FTC to define the scope of interoperability and corresponding technical standards. To be effective, mandated interoperability must be bundled with definitions of "fair, reasonable, and nondiscriminatory terms," as the recent proposals rightly emphasize.[264] Only that kind of protection against circumvention can pave the way to Przemyslaw Palka's *World of Fifty (Interoperable) Facebooks*.[265]

Open APIs and mandatory interconnection can be compatible with content moderation by the delivering platform. The horizontal must-carry element, which is necessarily part of the interoperable regime, does not need to include a blanket check for third-party content. Facebook, for example, can apply the same rules to postings originating from competing platforms as it applies to posts stemming from Facebook users. Facebook's discretion would end where it discriminates third-party content based on its origin instead of its

259. Harold Feld, *Case for the Digital Platform Act*, ROOSEVELT INST. 81–82 (2019).

260. *See* Nachbar, *supra* note 29, at 125–26.

261. Final Judgement at 4, United States v. Microsoft Corp., No. 98-1232 (D.D.C 2002).

262. Eben Moglen, *Shaking Up The Microsoft Settlement*, FREE SOFTWARE MATTERS (Jan. 28, 2002), http://moglen.law.columbia.edu/publications/lu-18.html.

263. Augmenting Compatibility and Competition by Enabling Service Switching Act of 2019 (ACCESS Act of 2019), S. 2658, 116th Cong. (2019); Augmenting Compatibility and Competition by Enabling Service Switching Act of 2021 (ACCESS Act of 2021), H.R. 3849, 117th Cong. (2021).

264. S. 2658; H.R. 3849 ("fair and nondiscriminatory").

265. *See* Przemyslaw Palka, *The World of Fifty (Interoperable) Facebooks*, 51 SETON HALL L. REV. 1193 (2021).

content. Mindful of content moderation dimensions, Mike Masnick urges a focus on protocols instead of platforms.[266] Masnick recalls the email protocol standards which enabled competing email services to co-exist and differentiate based on interfaces and features.[267] Content moderation would benefit from that reorientation, as a "protocol-based system . . . moves much of the decision making away from the center and gives it to the ends of the network."[268]

As a result, the output of platform services would increase, and digital platforms could no longer extract the same monopoly rents. Interoperability requirements would redistribute surplus from the platform layer of the digital stack to the content layer.[269] On video sharing platforms, this mechanism may benefit artists on social media and news outlets. This redistribution of surplus can have diffuse, positive effects through the creation of public goods on top of open structures.[270] On the other hand, shifts in surplus may decrease the incentives for dynamic innovation in the platform market. Nonetheless, some rebalancing toward more incentives for allocative efficiency and innovation *on platforms* appears overdue.

Most importantly, interoperability requirements prevent network effects at the infrastructure level from shaping content management. As network surplus no longer translates into market entry barriers, digital platforms can no longer use network effects as levers for economic, political, or cultural power exertion. To be clear, interoperability mandates between platforms preserve the structural nexus between platform and content management; they simply facilitate competition between vertically integrated content-shaping platforms.

Some scholars point to tensions between competition-enhancing reforms and privacy frameworks.[271] These tensions stand out especially in the context

266. Mike Masnick, *Protocols, Not Platforms: A Technological Approach to Free Speech*, KNIGHT FIRST AMEND. INST. (Aug. 21, 2019), https://knightcolumbia.org/content/protocols-not-platforms-a-technological-approach-to-free-speech (envisioning novel business models, including based on cryptocurrencies and digital tokens).

267. *Id.* at 15.

268. *Id.* at 17. *See also* Rozenshtein, *supra* note 28.

269. *But see* Genevieve Lakier, *The Limits of Antimonopoly Law as a Solution to the Problems of the Platform Public Sphere*, KNIGHT FIRST AMEND. INST. 4 (Mar. 30, 2020), https://knightcolumbia.org/content/the-limits-of-antimonopoly-as-a-solution-to-the-problems-of-the-platform-public-sphere ("[A]ggressive enforcement of the antitrust laws against big tech [would not] do anything about" the distribution of advertising dollars.").

270. *See* Andersen Jones, *supra* note 164, at 631–37 (discussing public funding for journalism as a public good); Brett M. Frischmann, *An Economic Theory of Infrastructure and Commons Management*, 89 MINN. L. REV. 917, 973–74 (2005) (focusing on infrastructure commons).

271. *See* Erika M. Douglas, *The New Antitrust/Data Privacy Law Interface*, 130 YALE L.J. F. 647 (2021).

of active interoperability. Enhanced data sharing and information exchange fuel these concerns. Users entrust their data and information with one platform, be it Facebook, Google, or Apple. If a mandate obliges that entity to share information with third parties, users' privacy would be further impacted. Yet, the same concern holds against contemporary control-centered frameworks. As ample scandals and widespread private surveillance indicate, this framework has not been overly successful in protecting individuals' privacy, even in a highly centralized environment. Alternative approaches may yield more promising conceptualizations of privacy protection online, whether they include moving toward "Data as a Democratic Medium,"[272] systemically addressing externalities,[273] limiting data usage, or establishing fiduciary duties.[274] Even control and consent-based approaches can allow for opt-in interoperability.

2. Passive Interoperability

Second, there is passive adversarial interoperability.[275] The concept does not require collaboration between platforms. Instead, it alleviates some of the legal building blocks protecting online monopolies, emphasizing the contribution of reverse engineering.[276] In his analysis of the approach, Cory Doctorow provides numerous examples, including Apple's challenge to Microsoft Word by creating compatible office software, the development of web crawlers, and "[s]ervers of every kind."[277] To some extent, nascent platforms can follow similar methods. The *hiQ v. LinkedIn* case exemplifies just one dimension of affordances based on access to data.[278]

Frequently, however, legally protected exclusivity stands in the way of reverse engineering.[279] Recall that, among other laws, the CFAA creates data silos,[280] and terms of service may limit access to data or features. Broad patent

272. Viljoen, *supra* note 84, at 634–53.

273. *See* Omri Ben-Shahar, *Data Pollution*, 11 J. LEGAL ANALYSIS 104 (2019); Bergemann et al., *supra* note 86; Lina M. Khan & David E. Pozen, *A Skeptical View of Information Fiduciaries*, 133 HARV. L. REV. 497 (2019).

274. Balkin, *Free Speech is a Triangle*, *supra* note 1; Jack M. Balkin, *Information Fiduciaries and the First Amendment*, 49 U.C. DAVIS L. REV. 1185 (2016).

275. Cory Doctorow, *Adversarial Interoperability: Reviving an Elegant Weapon From a More Civilized Age to Slay Today's Monopolies*, ELEC. FRONTIER FOUND. (June 7, 2019), https://www.eff.org/deeplinks/2019/06/adversarial-interoperability-reviving-elegant-weapon-more-civilized-age-slay; Cory Doctorow, *Adversarial Interoperability*, BOINGBOING, https://boingboing.net/2019/10/02/plug-and-play.html (last visited June 28, 2021).

276. Doctorow, *supra* note 275.

277. *Id.*

278. hiQ Labs, Inc. v. LinkedIn Corp., 938 F.3d 985 (9th Cir. 2019).

279. *See supra* Part II.C.

280. Kadri, *supra* note 3, at 971–74.

protection may also directly inhibit replications of processes or indirectly exert control via credible threats of costly litigation. This specifically applies to the protection of APIs.[281] Dialing back state-enforced exclusivity can ease some of these challenges. Suitable remedies include limiting the CFAA, refusing to enforce exclusive terms of service, scaling back intellectual property and trade secrecy, and shifting toward privacy regimes that put less emphasis on individual user control.

Concrete suggestions by various scholars and the Electronic Frontier Foundation include reforming the CFAA and eliminating the criminal provision that sanctions exceeding the authorization to access protected computers.[282] To address efforts replacing the CFAA's affordances through terms of service, federal legislation would be required to pre-empt state contract law.[283] Intellectual property protections for APIs, including process patents, could be abandoned, or made available according to FRAND conditions.[284] While this reduces the immediate reward for innovation,[285] significant incentives for technological progress remain. Improved interfaces enable interconnection which can be extremely valuable to nascent competitors. Furthermore, the state could limit its enforcement of terms of service—especially as they concern restrictions on reverse engineering and interconnection. This includes restrictions on commercial access to platforms and scraping. Shifting gears in data protection regulation away from user control would support passive interoperability and better protect against the perils of corporate surveillance. These reforms can and should be complemented by focusing on structural notions of antitrust and considerations of common carriage and access rights.

281. Mark A. Lemley & David McGowan, *Legal Implications of Network Economic Effects*, 86 CALIF. L. REV. 479, 533–34 (1998).

282. Kadri, *supra* note 3, at 988–93; Cindy Cohn, Mark Jaycox & Marcia Hofmann, *EFF's Initial Improvements to Aaron's Law for Computer Crime Reform*, ELEC. FRONTIER FOUND. (Jan. 17, 2013), https://www.eff.org/deeplinks/2013/01/effs-initial-improvements-aarons-law-computer-crime-reform; Jennifer Granick, *Thoughts on Orin Kerr's CFAA Reform Proposals: A Great Second Step*, CTR. FOR INTERNET & SOC'Y STAN. L. SCH. (Jan. 23, 2013), https://cyberlaw.stanford.edu/blog/2013/01/thoughts-orin-kerrs-cfaa-reform-proposals-great-second-step; Orin Kerr, *Proposed Amendments to 18 U.S.C. 1030*, VOLOKH CONSPIRACY (Jan. 20, 2013), https://volokh.com/2013/01/20/proposed-amendments-to-18-u-s-c-1030/.

283. *See* Sw. Airlines Co. v. Kiwi.com, Inc., No. 21-00098, slip op. at 6 (N.D. Tex. Sep. 30, 2021).

284. *See* Pamela Samuelson, *Are Patents on Interfaces Impeding Interoperability?*, 93 MINN. L. REV. 1943, 1945–46 (2009) (arguing for cautious and targeted changes, including closer scrutiny of patents on interfaces). *But see* Michael J. Schallop, *The IPR Paradox: Leveraging Intellectual Property Rights to Encourage Interoperability in the Network Computing Age*, 28 AIPLA Q. J. 195, 199–200 (2000).

285. Lemley & McGowan, *supra* note 281, at 533–34.

C. ANTITRUST DOCTRINE FOR DIGITAL PLURALISM

Concerns about market concentration have given rise to calls for antitrust reform and enforcement, both as part of tightened merger control and enhanced scrutiny of unilateral behavior.[286] Doctrinal pivots within the existing antitrust paradigm have the potential to improve the digital public sphere's market structure. The recent lawsuits against Big Tech will show how far, if at all, courts are willing to deviate from the Chicago School consensus. The lawsuits may undo mergers (Facebook)[287] and unbundle exclusive webs of contracts (Google).[288] Both could revitalize competition. However, the extent to which these measures would suffice to sustain competition despite enduring privatization of network effects remains to be seen.[289] For instance, the EU Commission's successful enforcement actions against Google's exclusive contracting failed to fundamentally change market conditions. To ensure sustainable competition, divestitures should be combined with interoperability requirements, as in the 2020 House Report on Competition in Digital Markets suggests.[290] A renewed focus on direct harm to consumers—instead of requiring proof of both harm and monopoly power in a distinct market—could overcome constraints stemming from the attempt to squeeze converging digital markets into rigid doctrine.[291]

I do not suggest that consumer welfare considerations in antitrust cannot contribute to digital pluralism. They can. Several cases against the operators of digital bottlenecks allege harm to consumers and demand remedies that would render the market structure more conducive to digital pluralism. With its lawsuit against Facebook, the FTC is testing a litigation strategy combining charges of monopolization with acquisitions that ordinarily fall under the merger control threshold—reviving the logic behind older precedents, predating modern merger control.[292] The Commission claims that Facebook's pattern of acquisitions amounts to exclusionary behavior in violation of

286. Glick et al., *supra* note 186, at 505–10.

287. First Amended Complaint, FTC v. Facebook, No. 1:20-cv-03590, Doc. 75-1 (D.D.C. Aug. 19, 2021).

288. Amended Complaint, United States v. Google, LLC, No. 1:20-cv-03010, Doc. 94 (D. D.C. Jan. 15, 2021).

289. *See* Francis Fukuyama, Barak Richman, Ashish Goel, Marietje Schaake, Roberta R. Katz & Douglas Melamed, *Report of the Working Group on Platform Scale* 20–21 (2020), https://cyber.fsi.stanford.edu/publication/report-working-group-platform-scale; Donald F. Turner, *The American Antitrust Laws*, 18 MOD. L. REV. 244, 253 (1955) (writing, in 1955, "[t]he promise of the Standard Oil case faded nearly away for quite a long time").

290. U.S. H.R. MAJORITY STAFF, *supra* note 90, at 377–87.

291. Herbert Hovenkamp, *Digital Cluster Markets*, 2022 COLUM. BUS. L. REV. 246, 271–77 (2022).

292. *See* Turner, *supra* note 289, at 251–52.

Section 2 of the Sherman Act.[293] If ultimately successful, the argument could loosen the requirement of specific anticompetitive conduct slightly, and more concretely, reestablish Facebook and Instagram as competing networks.[294] But even then, an extremely high bar for antitrust liability would persist and concentration from organic growth based on the legal allocation of network effects would remain unaddressed. Systemic change requires more than the potential correlation of efficiency and pluralism.

Beyond current legal doctrine, some argue that strengthening structural notions of antitrust law could pave the way to more pluralistic markets.[295] Recalling the Supreme Court decision in *Alcoa*,[296] Donald Turner suggests "distinguishing between the acquisition of monopoly power . . . and the persistent retention of monopoly over a substantial period of time."[297] The latter should be seen as sufficient to trigger antitrust liability, "put[ting] a time limit on continuing monopoly power."[298] An end date to market monopolization does not serve as punishment, but rather a limitation on the reward for initial innovation.[299] To be effective, antitrust reform should thus incorporate notions of no-fault liability[300] as a basis for structural changes and access rights.[301] For today's digital monopolies, concerns about healthy discourse further support Turner's approach.[302] Anticompetitive conduct could remain an indicator of monopoly power, but should cease to serve as a necessary condition for liability.[303]

Recognizing goals of antitrust law beyond maximizing consumer welfare could advance antitrust law's contribution to a pluralistic digital public sphere[304]—an approach other jurisdictions have consistently upheld, despite

293. First Amended Complaint at 76, FTC v. Facebook, No. 1:20-cv-03590, Doc. 75-1 (D.D.C. Aug. 19, 2021) ("Facebook has willfully maintained its monopoly power through its course of anticompetitive conduct consisting of its anticompetitive acquisitions.").

294. *See* Complaint, FTC v. Facebook, No. 1:20-cv-03590, Doc. 3 (D.D.C. Dec. 9, 2020).

295. Khan, *supra* note 78, at 803.

296. United States v. Alcoa, 377 U.S. 271 (1964).

297. Turner, *supra* note 20, at 1219.

298. *Id.*

299. *Id.* at 1219–20, 1222 (distinguishing criminal liability).

300. CARL KAYSEN & DONALD F TURNER, ANTITRUST POLICY 266 (1958) ("Possession . . . of unreasonable market power in trade and commerce . . . is hereby declared to be injurious to such trade or commerce."); Turner, *supra* note 20, at 1219–20.

301. On remedies, ZEPHYR TEACHOUT, BREAK 'EM UP: RECOVERING OUR FREEDOM FROM BIG AG, BIG TECH, AND BIG MONEY (2020); Guggenberger, *supra* note 79, at 327–37; Rory Van Loo, *In Defense of Breakups: Administering a "Radical" Remedy*, CORNELL L. REV. 1955 (2020).

302. *See supra* Part II.A.

303. Turner, *supra* note 206, at 289–90.

304. BAKER, *supra* note 101, at 59–60.

some reorientation toward a "more economic approach" during the 1990s.[305] Pre-Chicago School precedent in the United States specifically invoked the democracy-serving function of antitrust law,[306] and enabling digital pluralism certainly falls into that category. Eleanor Fox's proposal to revive the "historical goals of antitrust" would shift doctrine in a pluralistic direction,[307] as would the Effective Competition Standard favored by Marshall Steinbaum and Maurice Stucke.[308] Both approaches emphasize open markets ("opportunities for competitors") and decentralization of power.[309] Where platforms govern discourse, Thomas Nachbar's understanding of antitrust law as a rule against private regulation offers additional guidance.[310] Practically, a renewed, broader understanding of antitrust law's goals could be implemented by fully replacing the consumer welfare standard or complementing it with an additional layer of scrutiny.[311]

Antitrust doctrine could borrow from sector-specific competition policy, which already embraces structural perspectives. The National Television Station Ownership rule caps broadcasting television at an "aggregate national audience reach" of 39 percent.[312] This threshold had been limited to 35 percent before the D.C. Circuit ordered the FCC to revisit its threshold.[313] The purpose of this limitation and similar restrictions for radio[314] lies in the protection of pluralism and diversity of content.[315] The FCC can impose these limitations on radio and broadcasting companies as part of their licensing regime. The agency lacks an equivalent link for online platforms because the Supreme Court has refused to extend the First Amendment doctrine

305. *See* LUDWIG ULMER, KARTELLVERBOT UND AUßERÖKONOMISCHE RECHTFERTIGUNG (2014); Stucke, *supra* note 190, at 567–68; Anne C. Witt, *The European Court of Justice and the More Economic Approach to EU Competition Law—Is the Tide Turning?*, 64 ANTITRUST BULL. 172, 174–76, 212–13 (2019).

306. N. Pac. Ry. Co. v. United States, 356 U.S. 1, 4 (1958).

307. Fox, *supra* note 190, at 1182. *See also* John J. Flynn, *The Reagan Administration's Antitrust Policy, Original Intent and the Legislative History of the Sherman Act*, 33 ANTITRUST BULL. 259, 304–5 (1988).

308. Steinbaum & Stucke, *supra* note 92, at 601–03.

309. Fox, *supra* note 190, at 1182; Steinbaum & Stucke, *supra* note 92, at 602–03.

310. *See* Nachbar, *supra* note 15, at 88–93.

311. *See* Prat, *supra* note 149, at 10–14 (arguing for "two parallel reviews").

312. 47 C.F.R. § 73.3555(e)(1). Switzerland, for example, limits companies to acquiring a maximum of two TV and two radio channels, Heinemann, *supra* note 230, at 46.

313. Fox Television Stations, Inc. v. FCC, 280 F.3d 1027, 1036, 1052–53 (D.C. Cir. 2002). *See also* the FCC's former Diversity Index in Prat, *supra* note 149, at 8.

314. 47 C.F.R. § 73.3555(e)(1).

315. CONG. RSCH. SERV., FEDERAL COMMUNICATIONS COMMISSION (FCC) MEDIA OWNERSHIP RULES, No. R45338, 1 (Jun. 2021).

developed for broadcasting[316] to the internet.[317] Similar structural measures based on general antitrust law, instead of media pluralism regulation, however, could invoke precedent established in *Associated Press*.[318] There, the Court rejected the Associated Press' claim that the First Amendment immunizes it from needing to grant news organizations access to its network.[319] In doing so, the Court established a potent First Amendment carve-out for antitrust enforcement as a means for speech-relevant industrial organization.[320] Likewise, expanding antitrust doctrine may prove more resilient against challenges rooted in the recently strengthened Takings Clause.[321]

Finally, strengthening merger control can play a vital role by preventing "killer acquisitions"—takeovers of other nascent competitors to gut their products, ideas, or teams to protect the incumbents' position in the marketplace.[322] Tightening the standards would also broaden attainable exit options for start-ups and likely change their incentive structures to challenge market incumbents.[323] Ultimately, the prospect of nascent competitors' scaling up would increase, and competitive pressure could emerge more readily.[324]

At the end of the day, the extent to which lawmakers should rely on sector-specific competition policy or reformed antitrust doctrine remains a question of political calculus and institutional preferences. Without legislative action, changes in antitrust doctrine would require a significant shift in the Supreme Court's jurisprudence. That shift, however, is anything but likely. Biden-era administrative agencies appear more open to directional pivots. But due to the entirely court-reliant antitrust enforcement process, federal agencies will remain limited to the space courts grant them. Meaningful reforms must ultimately emanate from legislatures. Bipartisan momentum has been growing in Congress.[325] The same applies to state legislatures, which can play an

316. *See* Red Lion Broad. Co. v. FCC, 395 U.S. 367 (1969).

317. *See* Reno v. ACLU, 521 U.S. 844, 868–70 (1997).

318. *See* Associated Press v. United States, 326 U.S. 1 (1945).

319. *See* Gregory Day, *Monopolizing Speech*, 88 FORDHAM L. REV. 1315, 1355–57 (2020).

320. *Associated Press v. United States*, 326 U.S. at 20 ("The First Amendment affords not the slightest support for the contention that a combination to restrain trade in news and views has any constitutional immunity.").

321. *See* Cedar Point Nursery v. Hassid, 141 S.Ct. 2063 (2021).

322. Lemley & McCreary, *supra* note 218, at 63–65, 90–101. On killer acquisitions, see Cunningham et al., *supra* note 217.

323. Lemley & McCreary, *supra* note 218, at 90–101.

324. *Id.*

325. Cecilia Kang, *Lawmakers, Taking Aim at Big Tech, Push Sweeping Overhaul of Antitrust*, N.Y. TIMES (June 11, 2021), https://www.nytimes.com/2021/06/11/technology/big-tech-antitrust-bills.html.

important role in advancing a reform agenda,[326] as California has done in the field of privacy.

V. CONCLUSION

Platforms' market power lies at the core of the dysfunction of digital discourse and contemporary approaches to content moderation cannot compensate for the flawed market structure. While digital pluralism provides no panacea for dysfunctional discourse, it can effectively counterbalance systemic threats to democratic deliberation and lower the stakes of content moderation decisions. An industrial policy for digital pluralism requires interoperability mandates, forcing interconnection between platforms, and structural considerations and no-fault liability in antitrust doctrine. Access rights, common carriage obligations, and public infrastructure can further contribute to building a pluralistic and inclusive digital public sphere. The same holds for strengthening structural considerations and no-fault liability in antitrust doctrine. Together, these remedies can enhance the resilience of digital discourse.

326. Leah Nylen, *Apple, Google App Store Fights Move to the States*, POLITICO (Mar. 3, 2021), https://www.politico.com/news/2021/03/03/apple-google-app-store-fights-move-to-the-states-473388.

LIMITING ALGORITHMIC COORDINATION

Michal S. Gal†

ABSTRACT

Recent studies have proven that pricing algorithms can autonomously learn to coordinate prices and set them at supra-competitive levels. The growing use of such algorithms mandates the creation of solutions that limit the negative welfare effects of algorithmic coordination. Unfortunately, to date, no good means exist to limit such conduct. While this challenge has recently prompted scholars from around the world to propose different solutions, many suggestions are inefficient or impractical, and some might even strengthen coordination.

This challenge requires thinking outside the box. Accordingly, this article suggests four (partial) solutions. The first is market-based and entails using consumer algorithms to counteract at least some of the negative effects of algorithmic coordination. By creating buyer power, such algorithms can also enable offline transactions, eliminating the online transparency that strengthens coordination. The second suggestion is to change merger review so as to limit mergers that are likely to increase algorithmic coordination. The next two are more radical, yet can capture more cases of such conduct. The third involves the introduction of a disruptive algorithm, which would disrupt algorithmic coordination by creating noise on the supply side. The fourth and final suggestion entails freezing the price of one competitor, in line with prior suggestions to address predatory pricing suggested by Aaron S. Edlin and others. The advantages and risks of each solution are discussed. As antitrust agencies around the world are starting to experiment with different ways to limit algorithmic coordination, there is no better time to explore how best to achieve this important task.

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I. INTRODUCTION

Competition in the marketplace is the main tool used in our economy to promote consumer welfare.[1] For competition to take place, certain conditions must exist. It is well accepted that perfect competition ensues when a large number of firms selling similar products operate in markets characterized by price transparency and low entry barriers.[2] But what happens when the market conditions that were assumed to protect us from high prices have limited

1. TUWE LÖFSTRÖM, HILDA RALSMARK & ULF JOHANSSON, SWEDISH COMPETITION AUTH., COLLUSION IN ALGORITHMIC PRICING 8 (2021); *see generally* Ariel Ezrachi, *EU Competition Law Goals and the Digital Economy* 4–6 (Oxford Legal Stud. Rsch. Paper No. 17, 2018) (reviewing the goals of competition law in digital markets).

2. *See, e.g.*, John Roberts, *Perfectly and Imperfectly Competitive Markets*, *in* 3 THE NEW PALGRAVE: A DICTIONARY OF ECONOMICS, 837, 837 (1987).

effect, or even serve to limit competition and increase prices to supra-competitive levels? This is the potential effect of pricing algorithms—dynamic pricing software that sets the price for a product or service.[3]

The use of pricing algorithms in the commercial world is here to stay, and the number of firms employing these tools keeps growing.[4] Many U.S. firms report using pricing algorithms.[5] In the EU, 67% of firms who tracked their competitors on a daily basis reported doing so via algorithms, and 35% of such firms also used automatic repricing algorithms (with or without manual adjustments).[6] Frequent use of pricing algorithms is reported by, inter alia, online retail enterprises,[7] tourism and hospitality firms,[8] and petrol stations.[9] This is not surprising. Automating pricing cuts costs and saves resources by taking the human decision-maker out of the loop. Furthermore, by using predictive and strategic analytics, pricing algorithms enable firms to react to changing market conditions in a speedier and more sophisticated way.[10] Introducing automated pricing is also easy: for firms that lack the expertise or resources to develop such algorithms on their own, a growing industry of software intermediaries offer automated pricing services, promising to increase

3. Löfström et al., *supra* note 1, at 7–8, 10; ELENA DONINI, COLLUSION AND ANTITRUST: THE DARK SIDE OF PRICING ALGORITHMS 51 (2019), https://www.associazioneantitrustitaliana.it/wp-content/uploads/2020/10/Tesi-Elena-Donini.pdf.

4. U.K. COMPETITION & MKTS. AUTH., PRICING ALGORITHMS: ECONOMIC WORKING PAPER ON THE USE OF ALGORITHMS TO FACILITATE COLLUSION AND PERSONALISED PRICING 7 ¶ 1.2 (2018), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/746353/Algorithms_econ_report.pdf; Zach Y. Brown & Alexander MacKay, *Competition in Pricing Algorithms* 1 (Harv. Bus. Sch., Working Paper No. 20-067, 2020).

5. *See, e.g.*, Peter Seele, Claus Dlerksmeler, Reto Hofstetter & Marlo D. Schultz, *Mapping the Ethicality of Algorithmic Pricing: A Review of Dynamic and Personalized Pricing*, 170 J. BUS. ETHICS 697 (2021) (containing a review of uses of pricing algorithms).

6. EUR. COMM'N STAFF WORKING DOCUMENT, FINAL REPORT ON THE E-COMMERCE SECTOR INQUIRY: REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT 175 ¶ 603, (2017). https://ec.europa.eu/competition/antitrust/sector_inquiry_swd_en.pdf.

7. *Id.*

8. Arnoud V. den Boer, *Dynamic Pricing and Learning: Historical Origins, Current Research, and New Directions*, 20 SURVS. OPERATIONS RSCH. & MGMT. SCI. 1, 6 (2015); DONINI, *supra* note 3, at 7; Andrea Guizzardi, Flavio Maria Emanuele Ponsa & Ercolino Ranieri, *Advance Booking and Hotel Price Variability Online: Any Opportunity for Business Customers?*, 64 INT'L J. HOSP. MGMT. 85 (2017).

9. Stephanie Assad, Robert Clark, Daniel Ershov & Lei Xu, *Algorithmic Pricing and Competition: Empirical Evidence from the German Retail Gasoline Market* (CESifo, Working Paper No. 8521, 2020), https://ssrn.com/abstract=3682021.

10. ORG. FOR ECON. CO-OPERATION & DEV. (OECD), *Algorithms and Collusion: Competition Policy in the Digital Age*, 817 (Sept. 14, 2017), https://www.oecd.org/competition/algorithms-collusion-competition-policy-in-the-digital-age.htm.

a firm's revenues quickly and efficiently.[11] Given these benefits, why use any other pricing method?

Algorithms have been used for some decades to set prices. From a regulatory perspective, what makes them of interest now is that markets are being populated by new generations of pricing algorithms, powered by artificial intelligence. Such algorithms can learn to reach a given objective (such as maximizing profits) in dynamic environments without human intervention.[12] Put differently, these algorithms are capable of autonomously discovering a profit-maximizing price scheme.[13] As a result, as Ezrachi and Stucke argue, Adam Smith's "invisible hand" is displaced by the "digitalized hand."[14]

The problem is that pricing algorithms may change market dynamics and limit our ability to enjoy low, competitive prices.[15] Specifically, there is a growing and well-founded consensus that such algorithms can make it easier for competitors to coordinate prices, at least in some settings, leading to increased prices in markets where such coordination was previously much more difficult.[16] This troubling consensus is based not only on theoretical studies which highlight the traits of pricing algorithms and the ecosystem in which they operate, but on a growing body of experimental and empirical support. For example, a simulation study recently summarized in *Science* found that after repeated interactions, autonomous learning algorithms designed to maximize profits for each firm learned to coordinate on their own.[17] An empirical study of the German gasoline market showed that the use of pricing algorithms raised prices by 9–28%.[18] Quantum computing may further

11. Assad et al., *supra* note 9, at 42.

12. *Id.* at 2–3.

13. *Id.* at 5.

14. ARIEL EZRACHI & MAURICE E. STUCKE, VIRTUAL COMPETITION: THE PROMISE AND PERILS OF THE ALGORITHM-DRIVEN ECONOMY 27 (2016).

15. *See generally id.*; Ariel Ezrachi & Maurice E. Stucke, *Artificial Intelligence & Collusion: When Computers Inhibit Competition*, 2017 U. ILL. L. REV. 1775 (2017) [hereinafter Ezrachi & Stucke, *Artificial Intelligence*]; Ariel Ezrachi & Maurice E. Stucke, *Sustainable and Unchallenged Algorithmic Tacit Collusion*, 17 NW. J. TECH. & INTELL. PROP. 217 (2020) [hereinafter Ezrachi & Stucke *Tacit Collusion*]; Salil K. Mehra, *Antitrust and the RoboSeller: Competition in the Time of Algorithms*, 100 MINN. L. REV. 1323 (2016).

16. *See* discussion *infra* Section II.B.

17. Emilio Calvano, Giacomo Calzolari, Vincenzo Denicolò, Joseph E. Harrington Jr. & Sergio Pastorello, *Policy Forum: Protecting Consumers From Collusive Prices Due to AI*, 370 SCI. 1040 (2020) [hereinafter Calvano et al., *Protecting Consumers*] (summarizing the study published in Emilio Calvano, Giacomo Calzolari, Vincenzo Denicolò & Sergio Pastorello, *Artificial Intelligence, Algorithmic Pricing, and Collusion*, 110 AM. ECON. REV. 3267 (2020) [hereinafter Calvano et al., *Artificial Intelligence*]).

18. Assad et al., *supra* note 9, at 4–5.

increase the attractiveness of pricing algorithms and their potential harm to consumer welfare.[19] These concerns, which were acknowledged by regulators around the world,[20] as well as the OECD,[21] raise a red flag for regulators.[22]

Despite the potent effects of algorithmic pricing, fully autonomous price coordination by algorithms is not captured under antitrust laws.[23] This is mainly because the application of antitrust is conditioned on the existence of an agreement between firms to coordinate trade terms—i.e., cartelistic conduct. Accordingly, use of an algorithm to strengthen a cartelistic agreement would fall under the law.[24] However, oligopolistic coordination—wherein each competitor sets his trade terms unilaterally yet takes into account the plausible reactions of his rivals—is not considered an agreement, and therefore is legal. While the potential harm resulting from oligopolistic coordination (also sometimes called conscious parallelism or tacit collusion) has long been acknowledged, its legality was partly based on the assumption that oligopolistic coordination is uncommon, given the rarity of the market conditions conducive to such conduct.[25] Algorithms change this assumption, increasing the likelihood of autonomous coordination without a prior agreement (hereinafter "algorithmic coordination").[26]

Against this backdrop, antitrust agencies around the world are starting to experiment with different ways to limit algorithmic coordination. Unfortunately, existing regulatory tools are insufficient for this purpose. This challenge has prompted scholars from around the world to suggest different

19. *See, e.g.*, Apoorva Ganapathy, *Quantum Computing in High Frequency Trading and Fraud Detection*, 9 ENG'G INT'L 61 (2021) (noting that quantum computing can increase, inter alia, the speed at which the algorithm reacts to market changes, and its ability to engage in low-cost yet sophisticated analysis).

20. *See, e.g.*, FED. TRADE COMM'N, *FTC Hearing #7: The Competition and Consumer Protection Issues of Algorithms, Artificial Intelligence, and Predictive Analytics* (Nov. 13–14, 2018), U.K. COMPETITION & MKTS. AUTH, *Algorithms: How They Can Reduce Competition and Harm Consumers*, (Jan. 9, 2021), https://www.gov.uk/government/publications/algorithms-how-they-can-reduce-competition-and-harm-consumers/algorithms-how-they-can-reduce-competition-and-harm-consumers (noting that "collusion appears an increasingly significant risk if the use of more complex pricing algorithms becomes widespread"); JACQUES CRÉMER, YVES-ALEXANDRE DE MONTJOYE & HEIKE SCHWEITZER, EUROPEAN COMM'N—COMPETITION, COMPETITION POLICY FOR THE DIGITAL ERA 96 (2019), http://ec.europa.eu/competition/publications/reports/kd0419345enn.pdf.

21. OECD, *supra* note 10, at 18–31.

22. Under some circumstances, algorithms can help facilitate coordination with humans. We leave such instances for future research.

23. *Id.* at 33–42.

24. *See, e.g.*, United States v. Topkins, No. CR-15-00201 (N.D. Cal. Apr. 6, 2015).

25. *See* discussion *infra* Section II.B.

26. Michael Coutts, *Mergers, Acquisitions and Algorithms in an Algorithmic Pricing World* (2022) (on file with author).

solutions.[27] Yet, as elaborated below, many suggestions are inefficient or impractical. For example, suggestions that algorithms be tested by antitrust authorities to determine their effects on market prices[28] make it easier to detect coordination, but do not change its legal status. For the same reason, increasing the fault-based liability of developers or users of pricing algorithms[29] may also not capture algorithmic coordination, given that under current laws, the harms generated by them do not amount to legal wrongs. Some suggested solutions might even strengthen coordination. Take, for example, the proposal that algorithms be made transparent to all.[30] While transparency would help reveal cases where algorithms are used to create an illegal cartel, it could also help competitors overcome obstacles to coordination.[31] Suggestions for changing the law to regulate how algorithms can be designed and coded, so as to prohibit the mechanism that leads to algorithmic coordination (e.g., the parts of the code of the algorithm that lead to coordination) rather than focusing on its form (the presence or absence of an agreement),[32] tackle the root of the problem. Yet, this remedy runs the risk of limiting technological development. The same difficulty afflicts the most straightforward-sounding solution, namely prohibiting the use of pricing algorithms outright.

Fashioning a remedy for the problem of algorithmic coordination requires thinking outside the box. Accordingly, this paper suggests four partial solutions. The first is market-based: using consumer algorithms to counteract at least some of the negative effects of coordinating algorithms. Such algorithms can also enable offline transactions, overcoming the effects of online transparency, which strengthens coordination. The role of the regulator in this first solution is limited to ensuring that obstacles to the operation of such consumer algorithms are low. The second suggestion requires slightly more regulatory intervention: shape merger review so as to limit mergers that are likely to increase algorithmic coordination. This remedy is in line with the suggestion by Glen Weyl and Eric Posner in their book, *Radical Markets*,[33] that we can fundamentally reduce consumer harm in digital markets through

27. *See* discussion *infra* Part III.

28. *See, e.g.*, Francisco Beneke & Mark-Oliver Mackenrodt, *Artificial Intelligence and Collusion*, 50 IIC-INT'L REV. INTELL. PROP. & COMPETITION L. 109, 132 (2017); Calvano et al., *Protecting Consumers*, *supra* note 17, at 1040.

29. *See, e.g.*, H.R. 2231, 116th Cong. (2019) (enacted).

30. Lea Bernhardt & Ralf Dewenter, *Collusion by code or algorithmic collusion? When pricing algorithms take over*, 16 EUR. COMPETITION J. 312, 335 (2020).

31. *See* discussion *infra* Section III.B.

32. *See, e.g.*, Calvano et al., *Protecting Consumers, supra* note 17, at 1042.

33. Glen Weyl & Eric Posner, Radical Markets: Uprooting Capitalism and Democracy for a Just Society (2019).

innovative application of existing laws.[34] The other two suggestions are more radical, yet can capture more cases of algorithmic coordination. The third involves the introduction of a disruptive algorithm in markets characterized by algorithmic coordination; and the fourth entails freezing the price of one competitor, in line with prior suggestions to address predatory pricing by Edlin and others.[35] Importantly, the adoption of these last two remedies is not necessarily advocated. Rather, this Article aims to generate a discussion on tools for limiting the harms of algorithmic coordination, a goal that thus far seems beyond both traditional and novel solutions.

In what follows, Part II of the Article first reviews recent developments in the economic literature regarding the use of AI-powered pricing algorithms. Part III then analyzes the limited ability of traditional regulatory tools and Part IV discusses the remedies suggested so far to limit such harms. Part V then describes the four proposed solutions. The discussion outlines the rationale behind each solution, lays out conditions for their application, and points to possible virtues and problems.

II. PRICING ALGORITHMS: MOVING MARKETS FROM COMPETITION TO COORDINATION

A. PRICING ALGORITHMS: DEFINITIONS, TOOLS, AND TYPES

A pricing algorithm is a sequence of computational steps that use data inputs to set prices for a product or service (hereinafter together "product").[36] The inputted data can relate to a myriad of parameters, including one's own current and foreseeable production costs, and the prices, production capacity, and storage capacity of rivals. The algorithm applies decision procedures to the data, such as predictive analytics and optimization.[37] Such robo-economicus can be programmed to maximize any variable, based on the inputted data and their decision tools.

Algorithms can operate at different levels of abstraction.[38] At the lowest level, all parameters and optimal responses to specific contingencies are dictated by the developer in advance (so called "expert algorithms").[39] As such,

34. *Id.*

35. Aaron S. Edlin, *Stopping Above-Cost Predatory Pricing*, 111 YALE L.J. 941 (2002).

36. OECD, *supra* note 10, at 16; Shuchi Chawla, Jason D. Hartline & Robert Kleinberg, *Algorithmic Pricing via Virtual Valuations*, *in* EC '07: PROCEEDINGS OF THE 8TH ACM CONFERENCE ON ELECTRONIC COMMERCE 243 (2007).

37. *See* THOMAS H. CORMEN, CHARLES E. LEISERSON, RONALD L. RIVEST & CLIFFORD STEIN, INTRODUCTION TO ALGORITHMS 5, 192–93, 843–49 (3d ed. 2009).

38. Michal S. Gal, *Algorithms as Illegal Agreements*, 34 BERKELEY TECH. L.J. 67, 84–87 (2019).

39. *See* OECD, *supra* note 10, at 11–12.

they require a human to direct the software to execute a task.[40] At the highest level, algorithms are designed to set or to refine their own decision parameters in accordance with inputted data and the decision-making techniques they are coded to perform ("learning algorithms").[41] Learning algorithms employ machine learning—a type of artificial intelligence that gives computers the ability to learn from data inputs without the need to define correlations a priori, allowing them to autonomously determine their decisional parameters.[42] In reinforcement learning, for example, the algorithm devises and tests different actions, taking into account the feedback from previous rounds in each subsequent round. That is, it follows a trial-and-error strategy, balancing actions that will maximize the payoff based on its current knowledge with random actions that may entail sacrificing a short-term payoff for the sake of improving future gains.[43] Such methods allow algorithms to autonomously learn rules that will best help them achieve their stated goal, even without human intervention.[44]

Algorithms offer significant advantages in decision-making. They significantly speed up the collection, organization, and analysis of data, enabling exponentially quicker decisions and reactions to changing conditions.[45] They also offer analytical sophistication, potentially also enabling them to devise new strategies for reaching a goal.[46] They can be used in a myriad of tasks, such as determining efficient levels and locations for production and storage, assessing risk levels, and, of course, pricing decisions.[47] Although the use of pricing algorithms is not new, as elaborated below, changes in the digital ecosystem have affected their operation and made

40. Emilio Calvano, Giacomo Calzolari, Vincenzo Denicolò & Sergio Pastorello, *Algorithmic Pricing What Implications for Competition Policy*?, 55 REV. INDUS. ORG. 155 (2019).

41. *See, e.g.*, OECD, *supra* note 10, at 9–11. For examples of machine learning already used in algorithms, see Ezrachi & Stucke, *Artificial Intelligence, supra* note 15, at 1780–81.

42. *See generally* TOM MITCHELL, MACHINE LEARNING (1997). Other types of artificial intelligence include, for example, expert systems, which use databases of expert knowledge to offer advice or make decisions in such areas as medical diagnosis or stock exchange trading.

43. BUNDESKARTELLAMT & AUTORITÉ DE LA CONCURRENCE, *supra* note 20; Löfström et al., *supra* note 1, at 14–20.

44. Calvano et al., *Protecting Consumers, supra* note 17, at 1040.

45. *See, e.g.*, OECD, *supra* note 10, at 15; PATRICK GROTHER, MEI NGAN, & KAYEE HANAOKA, U.S. DEPARTMENT OF COMMERCE, ONGOING FACE RECOGNITION VENDOR TEST (FRVT) PART 2: IDENTIFICATION (2018) (discussing the speed at which algorithms perform facial recognition).

46. *See, e.g.*, Matthew Adam Bruckner, *The Promise and Perils of Algorithmic Lenders' Use of Big Data*, 93 CHI.-KENT L. REV. 3 (2018); Ulrich Schwalbe, *Algorithms, Machine Learning, and Collusion*, 14 J. COMPETITION L. & ECON. 568, 591 (2018).

47. *See* OECD, *supra* note 10, at 16.

them both cheaper and more efficient.[48] It is thus not surprising that the use of pricing algorithms is spreading fast.

To reduce confusion, let us distinguish the case we deal with from others. Ezrachi and Stucke identified four scenarios in which algorithms can be used for pricing decisions.[49] The first involves their use to implement, monitor, police, or strengthen a prior, explicit agreement among suppliers. In such situations, an anti-competitive agreement exists between the users of the algorithms, and the algorithms simply serve as tools for its execution. This can be exemplified by the *Topkins* case, in which Topkins and his co-conspirators designed and shared dynamic pricing algorithms, which were programmed to act in accordance with their illegal agreement.[50] The second scenario involves hub-and-spoke arrangements, where many firms rely for their pricing decisions on the same pricing services provider, which uses a pricing algorithm.[51] For example, in the *Ageras* case, the Danish Competition Council found that a digital platform for professional services created an illegal cartel when its algorithm suggested minimum prices that service providers should charge clients on the platform.[52] The third scenario involves use of an expert algorithm in a way that can be expected to create or strengthen price coordination (e.g., a leader-follower algorithm).[53] This scenario also encompasses use of semi-expert algorithms, where the programmer does not

48. *See infra* Section II.B.

49. EZRACHI & STUCKE, *supra* note 14, at 35–82.

50. Press Release, U.S. Dep't Just., *Former E-Commerce Executive Charged with Price Fixing in the Antitrust Division's First Online Marketplace Prosecution* (Apr. 6, 2015), https://www.justice.gov/opa/pr/former-e-commerce-executive-charged-price-fixing-antitrust-divisions-first-online-marketplace; *see also* U.K. GAS & ELEC. MKTS AUTH, INFRINGEMENT BY ECONOMY ENERGY, E (GAS AND ELECTRICITY) AND DYBALL ASSOCIATES OF CHAPTER I OF THE COMPETITION ACT 1998 WITH RESPECT TO AN ANTI- AGREEMENT (July 26, 2019), https://www.ofgem.gov.uk/sites/default/files/docs/2019/07/decision_on_economy_energy__e_gas_and_electricity_dyball_associates_infringement_of_chapter_i_ca98_doorstep_sales_redacted_decision_document_26_july_2019.pdf (describing how two energy suppliers used a third party software developer to facilitate the distribution of customers among themselves, where the software developer contributed through designing, implementing and maintaining software systems that allowed the acquisition of certain customers to be blocked and customer lists to be shared).

51. EZRACHI & STUCKE, *supra* note 14, at 46–55. For their economic effects, see, e.g., Joseph E. Harrington Jr, The Effect of Outsourcing Pricing Algorithms on Market Competition 2 (July 19, 2021), https://ssrn.com/abstract=3798847.

52. Press Release, Danish Competition and Consumer Auth., *Danish Competition Council: Ageras has infringed competition law* (June 30, 2020), https://www.en.kfst.dk/nyheder/kfst/english/decisions/20200630-danish-competition-council-ageras-has-infringed-competition-law/.

53. *See* EZRACHI & STUCKE, *supra* note 14, at 56–70; Ilgin Isgenc, *Competition Law in the AI ERA: Algorithmic Collusion under EU Competition*, 24 TRINITY C.L. REV. 35, 40–42 (2021).

explicitly dictate the algorithm's strategy, but feeds it clues as to how it should behave in a way that biases the algorithm's learning process towards coordination.[54]

This Article does not deal with these cases, in which coordination is achieved by using algorithms that produce predictable outcomes, and that require at least some human involvement in determining how one competitor reacts to another.[55] To paraphrase Bernhardt and Dewenter, these cases can be called "coordination with code."[56] Instead, this Article focuses on the most difficult case, "coordination by code," in which the algorithm itself adopts price coordination as the most profitable strategy. In this scenario, the algorithm is given a goal (e.g., profit maximization), and independently and autonomously determines its own pricing strategies.[57] Take, for example, the extreme case where the algorithm does not even directly observe rivals' prices in the market, but simply observes through trial and error the demand reactions to the prices it sets, and determines which price maximizes revenues. Not only does coordination in such cases occur without human involvement, but the workings of such algorithms are typically highly complex and opaque, making it difficult to understand the logical reasoning behind the process.[58]

B. CAN ALGORITHMS COORDINATE PRICES AUTONOMOUSLY?

Can algorithms actually coordinate prices autonomously in real life, or is this science fiction? Until recently, the common wisdom among economists was that algorithmic coordination is unlikely to arise in practice without explicit communication, especially under dynamic real-world conditions.[59] Some economists have even argued that, assuming complete knowledge of market

54. John Asker, Chaim Fershtman & Ariel Pakes, *Artificial Intelligence, Algorithm Design and Pricing,* 112 AER PAPERS & PROC. 452, 455 (2022).

55. *See* EZRACHI & STUCKE, *supra* note 14, at 71–82. The article also does not deal with cases in which the algorithm increases the potential for unilateral anti-competitive conduct, such as predatory pricing. *See* Christopher Leslie, *Predatory Pricing Algorithms*, 97 NYU L. REV. (forthcoming 2023).

56. Bernhardt & Dewenter, *supra* note 30, at 315.

57. Ezrachi & Stucke, *Artificial Intelligence*, *supra* note 15, at 1794–96.

58. *See, e.g.*, Davide Castelvecchi, *Can We Open the Black Box of AI*, 538 NATURE NEWS 20, 21 (2016) (characterizing deep learning and neural networks "as opaque as the brain").

59. *See, e.g.*, Ashwin Ittoo & Nicolas Petit, *Algorithmic Pricing Agents and Tacit Collusion- A Technological Perspective*, *in* L'INTELLIGENCE ARTIFICIELLE ET LE DROIT 241, 241 (Hervé Jacquemin & Alexandre de Streel eds., 2017)("While we do not deny the fact that smart pricing agents can enter into tacit collusion . . . , we find that there are several technological challenges . . . that mitigate that risk."); Schwalbe, *supra* note 46, at 572–73, 590, 592–94.

conditions, the "digitalized invisible hand" may make prices more competitive, not less.[60]

Yet, based on groundbreaking research developments over the past two years, there is growing and strong consensus that some algorithms operating in today's digital ecosystem can indeed overcome some barriers to coordination under some circumstances, and raise prices. According to a recent article in *Science*, "enough evidence has accumulated that autonomous algorithmic [coordination] is a real risk."[61]

Before we survey this body of research, a word about definitions is in order. Economists use the term "collusion" indiscriminately in a way which refers to a joint profit maximization strategy put in place by competing firms and focuses on the final coordinated outcome.[62] Accordingly, it includes both illegal cartelization and legal oligopolistic coordination. Legal scholars use the term more narrowly (some use the term, by itself, to refer only to the former). Thus, to limit confusion, the term "collusion" is used in this Article only in its restricted sense, to refer to illegal cartelization, while applying the term "coordination" to oligopolistic coordination.

Theoretical research has identified a number of attributes of today's algorithms, and of the digital world in which they operate, that under some market condition foster coordination and create a more durable supra-competitive equilibrium, one that is not limited to marginal cases.[63] Six main factors are reviewed herewith. The first is the greater availability of relevant data—a necessary input for learning algorithms. The move of many industries to online commerce, coupled with the high speeds and low costs of internet connectivity, computing power, and data storage, have made data on rivals' prices and other trade conditions (such as non-price competition aspects and reaction of consumers to different trade terms) more accessible than ever before.

Second, and relatedly, the speed at which today's algorithms can operate has increased the speed at which firms can detect and react to changes in market conditions.[64] This, in turn, implies that when transactions are small and

60. DONINI, *supra* note 3, at 90; *see also* Alexander Stewart-Moreno, *EU Competition Policy: Algorithmic Collusion in the Digital Single Market*, 1 YORK L. REV. 49, 67 (2020).

61. Calvano et al., *Protecting Consumers, supra* note 28, at 1041.

62. *See* George J. Stigler, *A Theory of Oligopoly*, 72, J. POL. ECON. 44 (1964); OECD, UNILATERAL DISCLOSURE OF INFORMATION WITH ANTICOMPETITIVE EFFECTS 20 (2012), www.oecd.org/daf/competition/Unilateraldisclosureofinformation2012.pdf (using the term collusion to refer to any coordinated conduct).

63. *See, e.g.*, EZRACHI & STUCKE, *supra* note 14, at 61–64; Gal, *supra* note 38, at 81–90. For some reservations, see Ittoo & Petit, *supra* note 58, at 241, 256; Schwalbe, *supra* note 46, at 572–75.

64. DONINI, *supra* note 3, at 58–60.

frequent, prices are transparent, and price changes are cheap, price reductions can be immediately detected and matched, thereby making them unprofitable.[65] The need for trust is also reduced when deviations can be quickly and more reliably detected.[66]

Third, the analytical sophistication of today's algorithms increases their ability to extract information from big data, enabling them to better predict demand as well as the likely reactions of rivals to changes in market conditions (including their own prices), and to determine the optimal price equilibrium in a dynamic environment.[67] This sophistication can reduce the risk of making pricing mistakes.[68] Furthermore, as Coutts argues, "algorithms can help firms navigate market complexity by elucidating potential focal points or collusive strategies in markets whose joint-profit maximizing equilibria sit just outside human cognitive capacity."[69] This is supported by theoretical economic models recently published by Abada and Lambin[70] and Brown and MacKay,[71] which found that when all firms employ pricing algorithms, simple linear strategies can support supra-competitive prices. Of course, algorithmic sophistication may also help facilitate deviations from the market equilibrium ("cheating") that are not easy to detect, for example, endogenizing the offer via loyalty rebates or complementary products. Accordingly, much depends on the conditions for sales in the market and the ability of other sellers to detect and to react to such deviations.

Fourth, the fact that the algorithm is a "recipe for action" makes its decision-making transparent (either directly or indirectly) and enables others to "read its mind," thereby reducing uncertainty with regard to the reactions of its rivals[72] and increasing the credibility that such actions will indeed take

65. Gal, *supra* note 38, at 88–89.

66. Mehra, *supra* note 15, at 1361; *see also* Guy Sagi, *The Oligopolistic Market Problem: A Suggested Price Freeze Remedy*, 2008 COLUM. BUS. L. REV 269, 298 (2008) ("The marginal time span from the act of deviation to the rivals' retaliation (as we assume is the case in collusive oligopoly markets) practically eliminates the boxes where one firm has low payoff and the other firms have high payoff in the oligopoly payoff matrix.").

67. Research into online markets suggests that when price competition is limited, firms compete more over non-price aspects (such as quality or return policies). Algorithms might be designed to take differences in such features, and their perceived effects on consumers' choices, into their calculations.

68. Peter Georg Picht & Benedikt Freund, *Competition (Law) in the Era of Algorithms*, 6 (Max Planck Inst. For Innovation & Competition, Rsch. Paper No. 18-10, 2018).

69. Coutts, *supra* note 26, at 7.

70. Ibrahim Abada & Xavier Lambin, Artificial Intelligence: Can Seemingly Collusive Outcomes Be Avoided? 1 (Feb. 15, 2020), https://ssrn.com/abstract=3559308 (finding such a result when rivals observe only market prices rather than the direct actions of rivals).

71. Brown & MacKay, *supra* note 4, at 32–33.

72. Gal, *supra* note 38, at 84–87.

place without the need for repeated interactions.[73] Such decision-making transparency, coupled with the increased transparency of market conditions (including prices) in digital ecosystems, serves to reduce one of the main obstacles to coordination: imperfect information regarding rivals' probable reactions to one's actions.[74] It also changes the mode of communication needed to achieve coordination. Indeed, as Tennenholtz, has shown in another context, this implies that coordination can often be achieved in a one-shot game.[75]

Fifth, as Brown and MacKay have shown, the use of different pricing algorithms across firms endows some firms with a technological advantage that can discourage rivals from lowering prices in an attempt to gain market share, encouraging a follow-the-leader dynamic, which leads to higher prices for all firms.[76] Finally, pricing algorithms are within reach of firms of all sizes, in all industries. Firms can create their own pricing algorithms at a reasonable cost using freely available complex algorithms (including algorithms based on neural networks). Alternatively, they can rely on sophisticated algorithms operated or supplied by third parties.[77] Some examples include Repricer[78] and Inoptimizer,[79] both of which are AI-powered pricing algorithms. The combined effect of these conditions, it is argued, is that in some markets pricing algorithms improve market players' ability as well as their incentive to coordinate.[80] While their greatest impact may be on markets for commoditized products with perfectly substitutable offerings from competitors and small, frequent transactions, they may facilitate coordination even when markets are less concentrated, firms are less homogenous, and market conditions are more complex than generally assumed to be necessary for coordination.[81]

One way to appreciate the effect of pricing algorithms on market dynamics is through their effects on the barriers to coordination that are recognized in

73. For the importance of reputation for truthfulness, see Dennis W. Carlton, Robert H. Gertner & Andrew M. Rosenfeld, *Communication Among Competitors: Game Theory and Antitrust* 5 GEORGE MASON L. REV. 423, 436 (1997).

74. *See* OECD, *supra* note 10, at 21–22.

75. Moshe Tennenholtz, *Program Equilibrium*, 49 GAMES & ECON. BEHAV. 363, 364 (2004).

76. *See* Brown & MacKay, *supra* note 4, at 1–3 (arguing that the intuition is that the slow firm recognizes that the fast firm will always beat its price, so it gives up on trying to have the lowest price; instead, it picks its price while internalizing how the faster firm will react).

77. Assad et al., *supra* note 9, at 42.

78. Amazon Repricing Software for Price Optimization & Intelligence, FEEDVISOR, https://feedvisor.com/amazon-repricer/ (last visited Jan. 6, 2022).

79. *Inoptimizer*, INTELLIGENCE NODE, http://www.intelligencenode.com/products-inoptimizer.php (last visited Jan. 6, 2022).

80. *See, e.g.*, Gal, *supra* note 38, at 89; Coutts, *supra* note 26.

81. Gal, *supra* note 38, at 89.

the economic literature. Nobel laureate George Stigler identified three cumulative conditions that must exist for coordination to take place: reaching an understanding that is profitable for all parties, timely detection of deviations, and a credible threat of retaliation that will deter such deviations.[82] As elaborated elsewhere, algorithms may assist firms in fulfilling each of these conditions.[83] Take, for example, the availability of information regarding market conditions: the noisier or more incomplete the information, the harder it is to coordinate.[84] As Green and Porter have shown, this is partly because demand fluctuations make it more difficult to set a stable, jointly profitable price, and also make detection of deviations much harder, thereby increasing the chance of a price war.[85]

Consider the following example: a supplier observes that demand for his product is reduced. He cannot effectively differentiate between natural changes in consumer demand, which are likely to affect all suppliers in the market (or even mainly his product if products are heterogeneous), and deviations from the status quo by a competing supplier. Both possibilities may lead the supplier to lower his prices, potentially triggering a price war. It may take time until coordination is once again achieved, if at all. Accordingly, the more imperfect the price signals among suppliers, the less stable the coordination. Now, add algorithms operating in a digital marketplace. The increase in the velocity of veritable information, coupled with the sophistication of algorithms, may lead to fewer errors and better coordination. Algorithmic sophistication also makes it easier to more quickly and efficiently solve the multidimensional problems raised by coordination, such as establishing a jointly profitable price in a market with differentiated products.[86] Indeed, studies performed by Google's artificial intelligence business, DeepMind, on algorithmic interactions found that algorithms with more cognitive capacity sustained more complex cooperative equilibria.[87] Another example relates to Stigler's third condition—making deviations unprofitable. Cooper and Kuhn show that explicit threats to punish cheating are the most important factor in successfully establishing coordination among humans,

82. Stigler, *supra* note 62, at 48–59.

83. Gal, *supra* note 38, at 81–90.

84. *See* Schwalbe, *supra* note 46, at 12.

85. Edward J. Green & Robert H. Porter, *Noncooperative Collusion under Imperfect Price Information*, 52 ECONOMETRICA 87, 94–95 (1984).

86. Gal, *supra* note 38, at 82.

87. Joel Z. Leibo, Vinicius Zambaldi, Marc Lanctot, Janusz Marecki & Thore Graepel, *Multi-agent Reinforcement Learning in Sequential Social Dilemmas*, *in* PROCEEDINGS OF THE 16TH INTERNATIONAL CONFERENCE ON AUTONOMOUS AGENTS AND MULTIAGENT SYSTEMS 464, 471 (2017).

once a cooperative strategy is established.[88] In the case of algorithms, the mere direct or indirect transparency of the algorithm, which includes a contingency for reaction in case a competitor changes his price, can communicate to competitors future intended actions.

Some scholars have challenged these theoretical studies, arguing that complexities often found in the real world reduce the probability of algorithmic coordination.[89] They point to the structural characteristics that best support coordination, which may not exist (e.g., a small number of competitors, homogeneous products, market transparency, and small and frequent purchases), as well as to design-related complexities (such as the time needed to train the algorithm to make decisions, and the computational challenges when numerous variables are introduced).[90] They conclude that algorithmic pricing only facilitates coordination in markets that are already conducive to [oligopolistic coordination], such that pricing algorithms simply removed the last obstacle to it.[91] Yet even if one accepts this claim, the question remains how many markets are on the verge of coordination. Furthermore, the growing sophistication of learning algorithms may lead to new coordination strategies, in which traditional obstacles are not relevant. Recall the two algorithms that learned to play chess simply by simulating millions of games in which they played against each other in the lab.[92] The algorithms created such effective strategies that they beat the world champion.[93] Is coordination under complex market conditions much more difficult? Finally, and most importantly, while some of the obstacles to coordination may not be affected by algorithms (e.g., the number of competitors in the market), others are being constantly improved by computer and data scientists (e.g., the level of sophistication of machine learning, the time and computing power it takes to analyze data) or by conditions in the digital economy (e.g., market transparency).

Of course, this does not imply that algorithms will enable coordination in all or even most markets.[94] Coordination might be especially difficult, for

88. David J. Cooper & Kai-Uwe Kühn, *Communication, Renegotiation, and the Scope for Collusion*, 6 AM. ECON. J. MICROECONOMICS 247, 268 (2014).

89. Ittoo & Petit, *supra* note 59, at 241.

90. *Id.* at 253–56.

91. *Id.* at 243.

92. Julian Schrittwieser, Ioannis Antonoglou, Thomas Hubert, Karen Simonyan, Laurent Sifre, Simon Schmitt, Arthur Guez, Edward Lockhart, Demis Hassabis, Thore Graepel, Timothy Lillicrap & David Silver, *Mastering Atari, Go, Chess and Shogi by Planning with a Learned Model*, 588 NATURE 604 (2020)

93. *Id.*

94. Ittoo & Petit, *supra* note 59, at 243 (arguing that current examples of known coordinations facilitated by algorithms occurred in markets where the algorithm removed the last obstacle to coordination); Cento Veljanovski, *Pricing Algorithms as Collusive Devices* (Inst. Of

example, when firms engage in discriminatory pricing based on personalized profiles,[95] products are semi-differentiated, transactions are far apart and large, firms have multi-market contact, transactions in one market have significant spillovers on other markets in which the seller operates (e.g., network effects), or prices or transactions are not transparent (e.g., in private auctions). Indeed, up until now, all studies of algorithmic coordination have generated proof-of-concept in simple market settings with commoditized goods. Nonetheless, it seems likely that algorithms could lead to price coordination in more cases than before, while reducing the need for direct communication among competitors.[96] This is especially true in digital markets with numerous asynchronous small transactions, with no spillovers into other markets and immediate information on one's rival's prices.

Indeed, recent computer simulation studies have discovered the emergence of autonomous coordination under some market conditions, suggesting that autonomous coordination by pricing algorithms is a real possibility. Most notably, in a seminal study, Calvano et al. show that commonly used reinforcement learning algorithms ("Q-learning"), which experiment with random actions and adapt their decisional rules accordingly, learned to initiate and sustain a supra-competitive equilibrium through a repeat-play reward-punishment scheme in an environment characterized by simultaneous pricing and repeated price competition, where each algorithm was instructed only to maximize its profits.[97] Coordination arose with no human intervention. Prices were almost always substantially above the competitive level (although they did not rise all the way up to the monopoly price), and quickly returned to a supra-competitive state even when they were externally forced to be competitive (the "shock" in the diagram below).[98] The observed pattern is very much consistent with that predicted by theoretical economic analysis of coordination between rational agents; and the findings are remarkably robust to variations and extensions.[99] Most importantly, the

Econ. Affairs, Rsch. Paper, 2020) (finding that the scale of learning required makes the adoption of learning algorithms unattractive commercially).

95. Gal, *supra* note 38, at 20–21. Accordingly, such a coordination-breaking effect might, be part of the analysis of the costs and benefits of personalized pricing.

96. *See* Ezrachi & Stucke, *Tacit Collusion*, *supra* note 15, at 228–29.

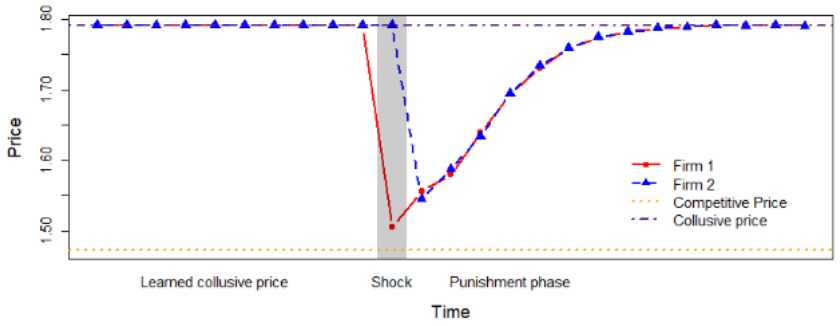
97. Calvano et al., *Protecting Consumers*, *supra* note 17, at 1041. For earlier work, see BRUNO SALCEDO, PRICING ALGORITHMS AND TACIT COLLUSION (2015), https://brunosalcedo.com/docs/collusion.pdf. For work on prediction algorithms, see, e.g., Jeanine Miklós-Thal & Catherine Tucker, *Collusion by Algorithm: Does Better Demand Prediction Facilitate Coordination Between Sellers?*, 65 MANAGEMENT SCI. 1552 (2019).

98. Calvano et al., *Protecting Consumers*, *supra* note 17, at 1041–42.

99. In a follow-up study, Calvano et al. also showed that algorithmic collusion can cope with more complex economic environments with imperfect information and imperfect monitoring. In general, their findings established that algorithmic collusion is not the product

algorithms did not condition their strategy on rivals' commitment to stick to the supra-competitive equilibrium, and did not communicate directly. Some limitations include the fact that it took the algorithms a relatively long time to learn to collude, yet this work provides proof of concept of the claim that learning algorithms can learn to collude.

Table 1: Price levels set by the algorithms (Calvano et al.)



Other simulation studies also show that algorithms are capable of coordinating in fabricated environments. For example, Klein et al. show that Q-learning algorithms in a sequential price-setting environment maintain a supra-competitive price level.[100] Q-learning algorithms do not necessarily scale well to more complex environments.[101] Hettich employed more powerful pricing algorithms using deep Q networks to simulate interactions in larger markets, and showed that under these conditions, high prices are reached much faster.[102] Malte employed another type of artificial intelligence, linear function approximation.[103] He found that the algorithms sustained supra-

of a fortuitous choice of parameters and prevails over a very broad range. Emilio Calvano, Giacomo Calzolari, Vincenzo Denicolò & Sergio Pastorello, *Algorithmic Collusion with Imperfect Monitoring*, 79 INT'L J. INDUS. ORG. 79 (2021).

100. Timo Klein, *Autonomous Algorithmic Collusion: Q-Learning Under Sequential Pricing* (Amsterdam Ctr. For L. & Econ., Working Paper No. 2018-15, 2020).

101. Ittoo & Petit, *supra* note 59, at 255. Yet previous learning was able to reduce the learning time to one tenth of its original interactions. Calvano et al., *Artificial Intelligence*, *supra* note 17, at 3300; *see also* Asker et al., *supra* note 54, at 456 (finding that even without dictating the algorithm's strategy, programmers may bias the algorithm's learning process towards coordination).

102. Matthias Hettich, *Algorithmic Collusion: Insights from Deep Learning* (2021), https://ssrn.com/abstract=3785966.

103. Jeschonneck Malte, *Collusion among autonomous pricing algorithms utilizing function approximation methods* (Heinrich Heine Univ. Düsseldorf, DICE Discussion Paper No. 370, 2021).

competitive prices, but tended to be exploitable by deviating agents in the short term, a fact we shall return to in one of the proposed solutions.

Empirical evidence showing that algorithms can learn to coordinate in practice is also beginning to accumulate. In seminal research, Assad, Clark, Ershov and Xu studied the effects of pricing algorithms in the German retail gasoline market. They found that prices were not affected when algorithmic pricing was adopted by either a monopolist, or by only one of the two firms in a duopoly market, but increased substantially (9–28%) after both firms in a duopoly switched from manual to algorithmic pricing.[104] These results suggest that algorithmic pricing raised margins through its effects on competition.[105] They also found that the impact increases with time, which is suggestive of autonomous learning.[106] Although the evidence was indirect (as the researchers inferred from other data when the algorithms started to operate), the findings are consistent with experimental results as well as with canonical economic models of coordination.[107]

The importance of such theoretical, experimental and empirical studies cannot be overstated. Together, they compel an undeniable and credible conclusion: under some market circumstances, pricing algorithms can achieve coordination at supra-competitive prices without any human intervention or prior agreement. Moreover, while it is important to study algorithmic coordination under wider and more challenging sets of market conditions (e.g., more players, more dynamic demand, multi-sided markets), there is good reason to believe that pricing algorithms will only get better at their tasks as technology continues to improve.[108] Accordingly, the threat to consumers is no longer science fiction. We now turn to the legality of autonomous algorithmic coordination.

III. ALGORITHMIC COORDINATION IS NOT ILLEGAL

> [N]ot all algorithms will have been to law school. So maybe there [are] a few out there who may get the idea that they should collude with another algorithm.[109]

Assume that the algorithm's code includes a compliance goal: "Never breach antitrust law." Would this remove the negative welfare effects created

104. Assad et al., *supra* note 9, at 5.

105. *Id.*, at 41–42.

106. Calvano et al., *Protecting Consumers*, *supra* note 17, at 1041.

107. Assad et al., *supra* note 9, at 42–43.

108. Algorithms also make it easier for colluders to engage in price discrimination. We leave the implications of this for future study.

109. Margrethe Vestager, EU Comm'r, Speech on Algorithms and Competition at the Bundeskartellamt 18th Conference on Competition, Berlin (Mar. 16, 2017).

by algorithmic coordination, based on mutual dependence in pricing, which occurs without human intervention, oversight, or even knowledge, and without communication? The answer is no.[110] This is because antitrust prohibitions of coordinated conduct are conditioned on the existence of "an agreement in restraint of trade." This has been interpreted as the offer and acceptance of an agreement not to compete.[111] Accordingly, pure oligopolistic coordination is not captured under the law, even though its effects on consumers are similar to those of an illegal cartel.[112] As Picht and Freund suggest, this focus on the mode of communication may be partly explained by the traditional assumption that coordination without prior agreement is not very common, given that in most industries complicating factors exist[113]—along with the difficulties in remedying pure oligopolistic coordination, and a fairness argument based on the fact that firms are simply reacting to market conditions, much like firms in competitive markets, as elaborated below.[114] Algorithmic coordination, which is based on similar conduct, is therefore also legal, despite the fact that it may become more common.

This is not to say that antitrust cannot capture any type of conduct which leads to algorithmic coordination. Antitrust laws can limit some actions which alter market conditions in a way that enables algorithmic coordination.[115] In particular, as I have suggested elsewhere, the legal prohibition of "plus factors"—intended and avoidable acts that facilitate coordination by creating conscious commitments to a common scheme, and are not justified on

110. *See, e.g.*, Gal, *supra* note 38, at 97–114 (arguing that oligopolisic coordination engaged in by algorithms does not infringe antitrust laws unless it constitutes a facilitating practice); Joseph E. Harrington, *Developing Competition Law for Collusion by Autonomous Artificial Agents*, 14 J. COMPETITION L. ECON. 331, 331 (2018).

111. Louis Kaplow, *On the Meaning of Horizontal Agreements in Competition Law*, 99 CALIF. L. REV. 683 (2011). Carlton et al. suggest that it can be difficult to define agreement when examining conduct among economic agents when no express communication has occurred. Carlton et al., *supra* note 73, at 424.

112. Theatre Enter. Inc. v. Paramount Film Distrib. Corp., 346 U.S. 537, 541 (1954) ("[T]his Court has never held that proof of parallel business behavior conclusively establishes agreement or, phrased differently, that such behavior itself constitutes a Sherman Act offense."); *see also* E.I. Dupont de Nemours & Co. v. FTC, 729 F.2d 128, 139 (2d Cir. 1984) ("The mere existence of an oligopolistic market structure in which a small group of manufacturers engage in consciously parallel pricing of an identical product does not violate the antitrust laws.").

113. In the U.S. context, *see, e.g.,* David Scheffman, *Commentary on 'Oligopoly Power, Coordination and Conscious Parallelism,' in* NEW DEVELOPMENTS IN THE ANALYSIS OF MARKET STRUCTURE 295 (Joseph Stiglitz & Frank Mathewson eds. 1986).

114. Picht & Freund, *supra* note 68, at 6.

115. For elaboration of such arguments, see, e.g., Axel Gautier, Ashwin Ittoo & Pieter Van Cleynenbreugel, *AI Algorithms, Price Discrimination and Collusion: A Technological, Economic and Legal Perspective*, 50 EUR. J. OF L. & ECON. 405, 429–30 (2020).

procompetitive grounds—can be applied to limit the ability of algorithms to coordinate.[116] Acts that raise red flags may include, inter alia, making it easier for competitors to observe one's algorithms and/or databases;[117] or technologically "locking" one's algorithm so that it is difficult to change, thereby increasing the commitment to the pricing scheme embedded in it. These acts could be plus factors, in that they may facilitate coordinated conduct; they are potentially avoidable; and they are unlikely to be necessary in order to achieve procompetitive results. Such practices may thus amount to "coordination by design," and should trigger a deeper investigation into procompetitive justifications. The remedy is clear and easy to apply: prohibiting the act of concern. Yet such prohibitions do not capture the hardcore case of autonomous algorithmic coordination.[118]

Some scholars suggest taking the principle of plus factors one step further. Thomas defines collusion as requiring only the presence of parallel informational signals which achieve a supra-competitive equilibrium.[119] Donini et al. suggest that the mere use of signaling algorithms should fall under the prohibition, even absent an anti-competitive intent.[120] Yet, while some forms of signaling might be considered a facilitating practice under some market conditions, it must be remembered that setting one's prices in a way which accounts for the expected reaction of one's rivals is the very definition of legal oligopolistic coordination. For the same reason, current prohibitions do not capture instances in which firms engage in a pattern of successive price increases, which amounts to repeated parallel pricing;[121] nor will it work to simply shift the burden of proof.[122] Indeed, similar suggestions were made by Posner several decades ago,[123] and were refuted by courts and antitrust

116. Gal, *supra* note 38, at 99–105, 110–15.

117. Interestingly, some laws relating to artificial intelligence require the transparency of the algorithm, in order to ensure that its decisions comply with other legal requirements (such as non-discrimination based on certain criteria, or content moderation that does not infringe freedom of speech). These laws might sometime inadvertently strengthen coordination, but legally mandating transparency to all. One potential solution to this clash is to limit transparency to rivals, while maintaining transparency towards enforcers.

118. *Id.* at 113–14.

119. Stefan Thomas, *Harmful Signals: Cartel Prohibition and Oligopoly Theory in the Age of Machine Learning* 15 J. COMP. L. & ECON. 159 (2019).

120. DONINI, *supra* note 3, at 109.

121. Alan Devlin, *A Proposed Solution to the Problem of Parallel Pricing in Oligopolistic Markets*, 59 STAN. L. REV. 1111, 1144 (2007) (suggesting an amendment of the law to capture instances such as repeated instances of price leadership).

122. *See* Bernhardt & Dewenter, *supra* note 30, at 82–83 (writing that the German Monopolies Commission recommends a comprehensive monitoring of markets before shifting the burden of proof).

123. RICHARD A. POSNER, ANTITRUST LAW: AN ECONOMIC PERSPECTIVE 146 (1976); Richard A. Posner, *Oligopoly and the Antitrust Laws: A Suggested Approach*, 21 STAN. L. REV. 1562,

agencies.[124] While it might be time to rethink such policies, and to more finely differentiate between different methods of reaching oligopolistic coordination, the law as it stands went down a different path.[125]

Another potential option is treating algorithmic coordination as a joint monopoly.[126] The firms operating the algorithms would then be subject to the legal restrictions imposed on monopolies. However, even if a joint monopoly can be proven, a rare event, it must still be shown that the algorithms monopolized their power. Yet algorithmic coordination does not generally involve exclusionary conduct, and high prices are not prohibited, as such.[127]

All of this raises a significant problem. As noted in the recent article in *Science*, "the increasing delegation of price-setting to algorithms has the potential for opening a back door through which firms could collude lawfully."[128] Indeed, as the use of sophisticated learning algorithms becomes more commonplace, more markets may move from collusion to coordination. And while both lead to supra-competitive prices, only the former is currently prohibited by our laws.

IV. LIMITATIONS OF EXISTING AND CURRENTLY PROPOSED SOLUTIONS

The increased potential for algorithmic coordination has generated a burgeoning literature suggesting innovative solutions. The benefits and limitations of the main suggestions made so far are briefly analyzed. The analysis relies on two basic assumptions. First, pricing algorithms may also

1562 (1969) [hereinafter Posner, *Oligopoly*]. Posner later repudiated his view. Richard A. Posner, *Review of Kaplow*, *Competition Policy and Price Fixing*, 79 ANTITRUST L.J. 761, 767 (2014) [hereinafter Posner, *Review*] (arguing that the efficacy of prohibiting oligopolistic coordination is also dependent on chilling effects: "any remedy for tacit collusion is likely to impose social costs . . . . I don't think one can have any confidence that punishing tacit colluders under antitrust law can produce net social benefits"). For criticism of the focus on agreement, see also Carlton et al., *supra* note 73 at 424 ("[A]ttempts to determine the legality of many forms of communication by assessing whether or not they conform to some connotation of the word "agreement" are inappropriate.").

124. Bell Atlantic Corp. v. Twombly, 550 U.S. 544 (2007).

125. Another problem involves the intent requirement, if the developer or user did not foresee the coordination, since some degree of human involvement is required to establish a causal link that can justify the imposition of liability. *See, e.g.*, Nicolo Zingales, *Antitrust Intent in an Age of Algorithmic Nudging*, 7 J. ANT. ENF. 386 (2019). This issue, which might require a fundamental change in our thinking, is beyond the scope of this article.

126. Karsten T. Hansen, Misra Kanishka & Mallesh M. Pai, *Frontiers: Algorithmic Collusion: Supra-Competitive Prices via Independent Algorithms*, 40 MKTG. SCI. 1 (2021).

127. Verizon Commc'ns, Inc. v Law Offs. of Curtis V. Trinko, LLP, 540 U.S. 398 (2004).

128. Calvano et al., *Protecting Consumers*, *supra* note 17; *See also* EZRACHI & STUCKE, *supra* note 14, at 39; Mehra, *supra* note 15; OECD, *supra* note 10.

yield benefits, for example by enhancing productive efficiency. Second, any legal rule should be reasonably easy to understand and follow.

A. PER SE ILLEGALITY

Some scholars suggest that algorithmic pricing should remain free from regulatory intervention, raising two lines of argument in support of this view. The first holds that algorithmic coordination is largely a speculative scenario, unlikely to be found in real-world markets. Schrepel, for example, contends that algorithmic coordination is fundamentally unimportant for antitrust, given the lack of conclusive empirical studies on the matter.[129] Yet, as elaborated above, in recent years empirical as well as experimental evidence has accumulated to make a strong case for the existence of algorithmic coordination under some market conditions. A related argument is that the lack of real-world cases brought against pricing algorithms indicates that this problem is not significant.[130] Yet if algorithmic coordination is legal, why should we expect cases? Furthermore, an absence of evidence does not equate to evidence of absence.[131] Moreover, even if at least some of the repricing software currently sold in markets is not sufficiently sophisticated to facilitate coordination,[132] this is not necessarily indicatory of the long-term status quo. Rather, it is in the interest of suppliers to seek more sophisticated software that would increase their profits.

Another line of argument holds that regulatory intervention will prevent firms from enjoying the benefits of using pricing algorithms, which could then translate into benefits to consumers, and that the costs of false positives from such intervention outweigh the costs of false negatives from not intervening (and thus allowing coordination to occur).[133] Others add that limiting the use of such algorithms will only serve to strengthen large firms, given that the loss of cost advantages associated with automated repricing might harm small firms more than large ones.[134] These claims depend on the efficiency of algorithms and the available regulatory tools, and cannot be evaluated in the abstract.

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129. Thibault Schrepel, *The Fundamental Unimportance of Algorithmic Collusion for Antitrust Law*, HARV. J. L. & TECH. (Feb. 7, 2020), https://jolt.law.harvard.edu/digest/the-fundamental-unimportance-of-algorithmic-collusion-for-antitrust-law.

130. *Id.*

131. Malte, *supra* note 103, at 34.

132. Vito Stefano Bramante, Emilio Calvano, Giacomo Calzolari & Maximilian Schaefer, *Algorithms in the Wild: Experimental Evidence from an Online Marketplace*, EODS RSCH. SYMP. (2022).

133. DONINI, *supra* note 3, at 90; Stewart-Moreno, *supra* note 60, at 67.

134. Maciej Hulicki, *Algorithm Transparency as a Sine Qua Non Prerequisite for a Sustainable Competition in a Digital Market?*, 6 EU & COMPAR. L. ISSUES & CHALLENGES SERIES, 238, 249–50 (2021).

An opposite suggestion can also be raised, that pricing algorithms should be banned altogether. Yet any remedy must not disregard the fact that such algorithms also yield benefits. Given that research on algorithmic pricing is still in its early stages, regulators should move cautiously.

B. DEVELOPMENT OF DETECTION TOOLS

Many scholars suggest that regulatory efforts should be concentrated on the development of better detection tools, which would alert authorities to instances of coordination and thus serve as "intervention triggers," to indicate when coordination is taking place.[135] To achieve this, antitrust authorities could employ computer and data scientists who are skilled in demystifying algorithms and analyzing the operation of pricing algorithms, a suggestion which has already been adopted in jurisdictions such as Australia and Britain.[136] Agencies could also deploy algorithms that automatically monitor markets to detect coordinated conduct in real time, analyzing price changes as well as changes in market conditions that may facilitate coordination.[137]

Another strand of such proposals focuses on transparency. Some scholars suggest requiring transparency in the design of algorithms, and in the data which is inputted into them, in order to enable external observers to understand their decision-making processes.[138] Others suggest mandating explainability of the considerations that led to a specific pricing decision. Proposals vary. For example, firms could be required to establish mechanisms that facilitate audits of artificial intelligence (AI) systems, such as logging all the system's processes and outcomes to ensure traceability.[139] Other proposals

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135. MASSIMO MOTTA & MARTIN PEITZ, INTERVENTION TRIGGERS AND UNDERLYING THEORIES OF HARM 43 (2020), https://ec.europa.eu/competition-policy/system/files/2021-03/kd0420575enn.pdf; Beneke & Mackenrodt, *supra* note 28, at 119–21; Giuseppe Colangelo, *Artificial Intelligence and Anticompetitive Collusion: From the 'Meeting of Minds' Towards the 'Meeting of Algorithms'?* 12 (TTLF Stan. L. School, Working Paper 74, 2021); DONINI, *supra* note 3, at 99–100; Bernhardt & Dewenter, *supra* note 30, at 331–32.

136. Bernhardt & Dewenter, *supra* note 30, at 331–32; *see also* Thibault Schrepel & Teodora Groza, *The Adoption of Computational Antitrust by Agencies: 2021 Report*, 2 STAN. COMPUTATIONAL ANTITRUST 78 (2022).

137. LÖFSTRÖM ET AL., *supra* note 1, at 24–25; DONINI, *supra* note 3, at 116–18; Nikita Koradia, Kiran Manokaran & Zara Saeed, *Algorithmic Collusion and Indian Competition Act: Suggestions to Tackle Inadequacies and Naivety*, *in* THE DIGITAL ECONOMY AND COMPETITION LAW IN ASIA 186–87 (Steven Van Uytsel ed., 2021); Bernhardt & Dewenter, *supra* note 30, at 332; Foo Yun Chee, *EU Considers Using Algorithms to Detect Anti-Competitive Acts*, REUTERS (May 4, 2018), https://uk.reuters.com/article/us-eu-antitrust-algorithm/eu-considersusing-algorithms-to-detect-anti-competitive-acts-idUKKBN1I5198.

138. Bernhardt & Dewenter, *supra* note 30, at 335; Hulicki, *supra* note 134, at 251–55; Koradia et al., *supra* note 137, at 184–85.

139. EUR. COMM'N, HIGH-LEVEL EXPERT GROUP ON ARTIFICIAL INTELLIGENCE, ASSESSMENT LIST FOR TRUSTWORTHY ARTIFICIAL INTELLIGENCE (ALTAI) FOR SELF-

go further, suggesting mandatory adoption of "white box algorithms"—algorithms designed such that their actions, decisions, and relationships between variables and outputs are observable and interpretable.[140]

Algorithmic transparency and explainability make it easier to investigate coordination. Such investigations are highly important, as they may enable authorities both to determine the extent of coordination, and to learn more about the market dynamics which enable it.[141] Yet analyzing algorithms is complicated, and demands a high degree of expertise.[142] Algorithmic transparency may also need to be balanced with the protection of trade secrets and privacy considerations, should the data also need to be examined.[143] Furthermore, explainability implies significant intervention in the market. For example, it would prevent firms from using deep learning algorithms, which might be more efficient and capable of generating innovative pricing schemes, but which are inherently not transparent.[144] Transparency could even facilitate coordination:[145] a competitor facing a transparent algorithm might need zero rounds to create coordination, because he can "read its mind" before reacting. But most importantly, simply observing algorithmic coordination does not change its legal status.

C. PROCESS-BASED PROHIBITIONS: REGULATING THE DESIGN OF THE ALGORITHM

The outcome of an algorithm is affected by the data inputted into it, as well as the analysis performed on such data. Accordingly, both can theoretically be regulated, to affect the algorithm's decision-making. Several such solutions are explored below.

Some commentators suggest changing the law to be process-based (i.e., regulating the process or mechanism that leads to coordination), rather than

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ASSESSMENT (2020), https://digital-strategy.ec.europa.eu/en/library/assessment-list-trustworthy-artificial-intelligence-altai-self-assessment; Hulicki, *supra* note 134, at 241.

140. Beneke & Mackenrodt, *supra* note 28.

141. *Id.* at 99–100; Koradia et al., *supra* note 137, at 187.

142. Hulicki, *supra* note 134.

143. Bamberger et al. argue that such "verification dilemmas," which must balance between opportunities that require the verification of some facts, and risks of exposing sensitive information in order to perform verification, can at least be partly overcome by zero-knowledge proofs (ZKPs)—a class of cryptographic protocols that allow one party to verify a fact or characteristic of secret information without revealing the actual secret. Kenneth A. Bamberger, Ran Canetti, Shafi Goldwasser, Rebecca Wexler & Evan J. Zimmerman, *Verification Dilemmas in Law and the Promise of Zero-Knowledge Proofs*, 37 BERKELEY TECH. L.J. 101 (2021).

144. Bernhardt & Dewenter, *supra* note 30, at 335.

145. Hulicki, *supra* note 134, at 249–56; Ilgin Isgenc, *Competition Law in the AI ERA: Algorithmic Collusion under EU Competition*, 24 TRINITY C.L. REV. 35, 48 (2021).

focusing on the existence of an agreement or communication between the parties.[146] Calvano et al., for example, suggest shifting the regulatory focus from communication to the coordinating pricing rules learned by the algorithm. In other words, they suggest prohibiting the use of pricing mechanisms (whole algorithms or parts thereof), which can be clearly shown to produce a predictable coordinated outcome, while ensuring that the efficiency gains from using such algorithms are not lost. To ensure that only non-coordinating algorithms are employed, they suggest that each algorithm would be subject to approval by a regulator prior to use, to verify that it is not likely to produce a coordinated outcome.[147]

The advantages of this solution are manifold. In part, they derive from the differences between human and algorithmic coordination. First, given that algorithms exist outside the mind of the individuals responsible for setting prices, they can be audited to determine what led to coordination (correlations, even if causality is not explained), thereby limiting the need to focus on communication.[148] Furthermore, the fact that a pricing algorithm is involved, and its input can be observed and regulated, enables the regulator to ensure that prices can be posted for consumers, but not (directly) observed by the algorithm. Second, the algorithm's reactions to different market conditions can be tested before it is put to use.[149] Accordingly, the algorithm's latent rules of conduct may be uncovered and regulated. Figure 1 (reproduced from Calvano et al.) depicts these differences between humans and algorithms in the processes that lead to price coordination.

146. Focus on economic effects, rather than on communication, was also suggested in the non-algorithmic context. *See*, *e.g.*, LOUIS KAPLOW, COMPETITION POLICY AND PRICE FIXING (2013). It was previously suggested by Posner. *See* Posner, *Oligopoly*, supra note 123, at 1562 (1969). Posner later changed his mind. *See* Richard Posner, *Review of Kaplow, Competition Policy and Price Fixing*, 79 ANTITRUST L.J. 761 (2014) (writing a subsequent article after having "second thoughts" about his original proposal.).

147. Calvano et al., *Protecting Consumers*, *supra* note 17, at 1041; *see also* Calvano et al., *supra* note 40, at 169; DONINI, *supra* note 3, at 98–99.

148. Calvano et al., *Protecting Consumers*, *supra* note 17, at 1041.

149. *Id.*; Gal, *supra* note 38.

Figure 1: Differences between humans and algorithms in the processes that lead to price coordination (Calvano et al., 2020)[150]

The process that produces higher prices

	COMMUNICATIONS	COLLUSIVE PRICING RULES	HIGHER PRICES
Humans	Present, discoverable	Latent, not discoverable	Observable, difficult to evaluate
Algorithms	Not present	Latent, discoverable	Observable, difficult to evaluate

More importantly, the suggested solution goes to the root of the problem—to the conduct which facilitates coordination. Indeed, some economic studies of algorithmic coordination point to potential changes in pricing algorithms that can restore a more competitive outcome. For example, Calvano et al. show that algorithms learn to price competitively if they are memoryless (i.e., they cannot remember past prices) or short-sighted (i.e., they do not value future profits).[151] Another potential benefit of such a solution is that it may be applied ex ante, by mandating that designers and users of algorithms include internal limitations that prevent coordinated outcomes (competition-by-design).[152]

In line with this proposal, other scholars have suggested specific process-centric limitations on pricing algorithms. Some suggestions relate to the data inputted into the algorithm. These include, for example, prohibiting the use of data which relates to prices set by rivals,[153] or restricting the storage of recent data on other firms' prices.[154] Other suggestions relate to the decisional process itself. For example, altering the code to include a (theoretical) threat of new entry,[155] or only permitting the use of algorithms that cannot react to data that

150. Calvano et al., *Protecting Consumers*, *supra* note 17, at 1040–41.

151. Calvano et al., *Artificial Intelligence*, *supra* note 17, at 3280.

152. *See, e.g.*, Gautier et al., *supra* note 115, at 429–30.

153. Brown & MacKay, *supra* note 4, at 45; Brendan Ballou, *The 'No Collusion' Rule*, 32 STAN. L. & POL'Y REV. 213, 248 (2021).

154. Ballou, *supra* note 153, at 248.

155. DONINI, *supra* note 3, at 110–14.

might lead to anti-competitive conduct.[156] To enable such regulation, the algorithm's code must be easily readable and understandable.[157]

Klein and Gaban suggest that compliance with such regulation can be aided by specialist private firms.[158] Indeed, RegTech firms already offer a multitude of services designed to build compliance into algorithms.[159] Aiscension, for example, is an AI-based service designed to limit the possibility of infringement of antitrust laws and the costs of internal reviews.[160] Algorithms that employ such services can potentially maximize a firm's profit while ensuring that it is not done through coordination.[161]

In theory, these suggestions resolve the predicament posed by algorithmic coordination in an elegant way. Yet three main problems arise. The first is legal: under current law, recognizing coordination is insufficient for preventing it.[162] Calvano et al. suggest making the pricing rules that result in coordination unlawful under Section 5 of the Federal Trade Commission Act.[163] Indeed, as Posner famously argued, oligopolistic coordination has elements of offer and acceptance, and thus can theoretically satisfy the requirements for an agreement.[164] Yet overcoming decades of case law that makes oligopolistic coordination legal—is a tall order. A change in the law might be required. Yet the law is a heavy ship, which does not easily change its course.

The second problem is identification: identifying the pricing rules that lead to coordination and distinguishing them from other parts of the code. In order to prohibit a certain conduct, the law must be clear on what exactly is prohibited and what firms are allowed to do. Calvano et al. suggest that antitrust authorities experiment in the lab to determine which pricing rules

156. *Id.* at 111; Schwalbe, *supra* note 46, at 599; *see also* Miklos-Thal & Tucker, *supra* note 97 (addressing the impact on market outcomes of algorithms that are "hard-coded," meaning they have no ability to explore and learn via market interactions).

157. DONINI, *supra* note 3, at 112 (suggesting that this might require tools that create explainability in human language, rather than machine code).

158. Vinicius Klein & Eduardo Molan Gaban, A New Language for AI and the Legal Discourse, 20 (2021) (unpublished article), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3927985.

159. *Id.* at 15, 18.

160. DLA PIPER, https://www.dlapiper.com/en/europe/focus/aiscension/overview/ (last visited Feb. 9, 2022).

161. Klein & Gaban, *supra* note 144, at 18–19.

162. *See, e.g.*, Gal, *supra* note 38, at 97–114 (arguing that oligopolisic coordination engaged in by algorithms does not infringe antitrust laws unless it constitutes a facilitating practice); Joseph E. Harrington, *Developing Competition Law for Collusion by Autonomous Artificial Agents*, 14 J. Competition L. Econ. 331, 331 (2018).

163. Calvano et al., *Protecting Consumers*, *supra* note 17, at 1042.

164. POSNER, *supra* note 123, at 1081.

might lead to coordination.[165] Yet such experiments often depend on the environment in which the algorithm is tested. Significant challenges thus arise regarding the market conditions authorities should take into account when testing the algorithm. To name a few, should the number of rivals and the degree of product differentiation be based on current, foreseeable, or theoretical circumstances? What is the relevant time frame—a question which might be especially relevant when algorithms need time to learn and devise their own strategies? What assumptions should be made with regard to the decision-making of one's rivals, especially when using different types of algorithms may lead to different outcomes? To the degree that these conditions determine the outcome, a large number of settings might need to be tested a priori, or regulators might need to monitor changes in market conditions and test the algorithm repeatedly. These monitoring issues are exacerbated by the fact that, as Assad et al. emphasized, there is no standard format by which algorithms operate. Instead, they are often customized for a specific information technology setting and for a particular problem faced by a firm.[166] Furthermore, especially when learning algorithms are employed, any monitoring scheme would require continuous adaptation to the latest algorithmic technology.[167] All of this would be resource-intensive and raise issues of competence. But even if all these issues could be overcome, unless all assumptions are clear ex ante, it would be difficult to create certainty for firms investing in algorithms. Indeed, as algorithms or market conditions change, the decision-maker must also be able to change his decision of whether the use of a certain algorithm is allowed or not. But if such changes are not known ahead of time, this might limit the ability of firms to make long-term investments in their algorithms, in fear that, one day, their use will be prohibited. For the same reason, self-regulation is not necessarily a straightforward, efficient solution. In addition, in some cases it might be impossible to identify and separate the relevant part of the code from the rest of the algorithm, such as if a deep learning algorithm devises a new strategy for maximizing profits, which leads to coordination. The whole algorithm would need to be prohibited.

The third problem, which focuses on the remedy, is more fundamental and difficult to fix. Assume that we succeed in identifying that part of an algorithm's code that leads to coordination. How do we ensure that prohibiting its use necessarily leads to increased welfare, and that the efficiency gains from using such algorithms are not lost? This is especially true, as noted above, in that proscribing only the problematic bit of code may be impossible, implying

165. Calvano et al., *Protecting Consumers*, *supra* note 17, at 1042.

166. Assad et al., *supra* note 9, at 47.

167. Bernhardt & Dewenter, *supra* note 30, at 83–84.

that the use of learning algorithms might have to be prohibited altogether. The efficiency of such a prohibition poses a big challenge, which goes to the core of what we know about market dynamics. Given the importance of this challenge, it is elaborated below.

Proposals for regulatory intervention in algorithmic code raise similar issues to those that led antitrust authorities around the world not to regulate oligopolistic coordination, even though it can theoretically meet the "agreement" requirement. This decision was based on three main factors.[168] First, firms in all markets, including competitive ones, determine their prices based on market conditions, including prices set by their rivals and rivals' foreseeable reactions to their own price changes. It is thus not fair, the argument goes, to prevent oligopolists from setting their prices in the same way.[169] Another way to understand this argument is that, in relation to the ways firms react to market conditions, coordination is indistinguishable from conduct of firms in competitive markets. Thus, while a cartelistic agreement is an artificial interference in market conditions, oligopolistic coordination is a natural reaction to market conditions. Yet, in my view, the fairness argument can be countered on a normative level: if similar conduct under different market scenarios lead to different effects on social welfare, and we can clearly differentiate between the different scenarios, then the fact that the conduct is similar, by itself, does not mandate similar legal reaction. In fact, our monopoly prohibitions may prohibit conduct, engaged in by a monopoly, that would have been legal if engaged in by a firm in a competitive market. The second reason is that, as noted above, oligopolistic coordination was seen by some economists as a rare occurrence.[170] This may no longer be the case.

The third reason is the most challenging, and focuses on the difficulty of fashioning a suitable remedy.[171] Specifically, the regulator would have to determine what weight, if any, firms should be allowed to give different factors, such as the prices set by rivals, in their decision-making. As suggested by Justice (then judge) Breyer, oligopolistic coordination does not constitute an offense, "not because such pricing is desirable (it is not), but because it is close

168. *See* Donald F. Turner, *The Definition of Agreement Under the Sherman Act: Conscious Parallelism and Refusals to Deal*, 75 HARV. L. REV. 655, 671 (1962) [hereinafter Turner, *The Definition*]; Donald F. Turner, *The Scope of Antitrust and Other Economic Regulatory Policies*, 82 HARV. L. REV. 1207, 1231 (1969) [hereinafter Turner, *The Scope*].

169. Turner, *The Definition*, *supra* note 168, at 671; Turner, *The Scope*, *supra* note 168, at 1231.

170. *See generally* Scheffman, *supra* note 113.

171. *See, e.g.*, Posner, *Review*, *supra* note 123, at 765 ("remedy . . . is the principal problem presented by proposals to make [oligopolistic coordination] illegal"); Gregory J. Werden, *Economic Evidence on the Existence of Collusion: Reconciling Antitrust Law with Oligopoly Theory*, 71 ANTITRUST L.J. 719 (2004).

to impossible to devise a judicially enforceable remedy for 'interdependent' pricing. How does one order a firm to set its prices without regard to the likely reactions of its competitors?"[172] Posner makes a similar claim:

> A seller must decide on a price. But if tacit collusion is forbidden, how does a seller in a market in which conditions (such as few sellers, many buyers, and a homogeneous product) favor convergence by the sellers on a joint maximizing price, and adherence to that price, decide what price to charge? If he charges the joint maximizing price (and his "competitors" do as well), and tacit collusion is illegal, he is in trouble. But how is he to avoid getting into that trouble? Would he have to adopt cost-plus pricing? That would be a safe harbor, but would be the equivalent of subjection of the firm to old-fashioned public utility/common carrier rate regulation, which has been discredited, and would require a total institutional makeover of antitrust law.[173]

Such intervention in market dynamics would only be justified if it would lead to an efficient market equilibrium, one that increases consumer welfare while accounting for not only static effects but also long-term dynamic effects. Economic theory, however, does not supply good answers as to how much weight should be given to rivals' prices or pricing behavior in order to set a price that is optimal for long-term consumer welfare. All agree that the pricing rule should create sufficient incentives for productive and dynamic efficiency, but conditions for optimal investments have been debated for decades with no clear answer.[174] Moreover, existing studies assume that firms can and will react to prices set by their rivals—a condition which no longer holds once we limit the ability of algorithms to react to prices set by their rivals. Accordingly, the long-term dynamic effects of such an intervention on productive and dynamic efficiency are yet to be studied. Furthermore, to ensure that consumer welfare is not harmed, the quality and quantity of both the product and the level of service provided would have to be monitored and potentially regulated, and not just price. We explore several examples of this challenge below.

Assume a simple mutual interdependence in pricing: each firm realizes it cannot steal enough consumers from its rival before it can respond, and the rival will respond because it is more profitable to match the price cut and share the market at a lower price than to permit the price-cutting rival to steal market share. Each would not cut price in the first instance. Cooperative pricing is

172. Clamp-All Corp. v. Cast Iron Soil Pipe Institute, 851 F.2d 478, 484 (1st Cir. 1988).

173. Posner, *Review*, *supra* note 123, at 763.

174. *See generally* RICHARD J. GILBERT, INNOVATION MATTERS: COMPETITION POLICY FOR THE HIGH-TECHNOLOGY ECONOMY (2020) (reviewing the state-of-the-art literature on conditions for innovation).

therefore a logical outcome of a market game without secret meetings or additional communication beyond price information, which is communicated to both rivals and consumers. In this setting, unilateral interest, by itself, leads to cooperative pricing, which is self-enforcing.[175]

Now, in order to prohibit such coordination, assume that we do not allow pricing algorithms to give any weight to rivals' prices. This might impede coordination by limiting firms' ability to send price signals that could then be followed by rivals. Yet there are alternatives that might still allow coordination, if the algorithm engages in trial-and-error strategy, testing profits under different pricing decisions, without directly observing prices. Indeed, as Posner acknowledged, to limit coordination algorithms may need to be insensitive to demand, since demand incorporates the effects of one's price on the prices of one's rivals and hence the demand for one's good.[176]

But more importantly, prices serve functions other than enabling coordination. They are a fundamental element in pricing decisions even under perfect or workable competition, as they affect the ability to respond to changes in cost and demand conditions, as well as incentives to enter and invest in oligopolistic markets.[177] Take, for example, a market where different firms offer differentiated products. Each firm sets its price (slightly) above competitive levels, depending, inter alia, on the prices set by rivals as well as the extent to which consumer demand to their products differs. Thus, price plays an important role in creating incentives for firms to invest in carving a niche for themselves by offering a product that some consumers would prefer (a situation known as monopolistic competition), even if they have limited overall market power. Or take a case where a firm is considering whether to make a large investment in a new and better product. Should its investment succeed, it hopes to cover its costs by pricing a bit higher than its rivals. Compelling the firm to disregard competitors' prices increases its uncertainty about whether its investment will be profitable. Or, a firm might think that a competitor has better insights into changes in market demand, which are reflected in its price changes.[178] Such prohibitions would remove an essential function of price information in markets, effectively forcing firms to operate while partially blindfolded.

This raises the question of how learning algorithms will perform in such fabricated environments, and how their performance would affect incentives for market entry and innovation. The problem is that economic theory has not

175. Carlton et al., *supra*, note 73, at 428.

176. Posner, *Review*, *supra* note 123, at 765.

177. Carlton et al., *supra* note 73, at 429; United States v. Socony-Vacuum Oil Co., 310 U.S. 150, 224 (1940) ("Pricing dynamics are 'the central nervous system of the economy.'").

178. Posner, *Review*, *supra* note 123, at 764.

as of yet generated definite economic models determining which market conditions lead to oligopolistic coordination, and, relatedly, what is the role that the ability to react to other firms' prices plays in entry and investment decisions in such markets.[179] Furthermore, the knowledge that firms will not be able to react to prices of their rivals, may reduce entry into oligopolistic markets and lead to reductions in social welfare.[180] For similar reasons, such a prohibition might also reduce the incentives of firms to use otherwise beneficial pricing algorithms, unless human-facilitated oligopolistic coordination is also prohibited. As Posner suggests, another problem arises with regard to regulating passivity as an enabler of oligopolistic coordination—that is, when firms decide not to actively poach their rivals' consumers. Ordering firms to compete is very different from ordering them not to agree not to compete.[181]

The fact that rivals' prices serve an important function also refutes an argument offered by Calvano et al.—namely, that removing from an algorithm those parts of the code that lead to coordination can involves similar tasks such as constraining racial and gender bias by preventing the use of certain data.[182] The analogy is not complete.[183] This is because race and gender are not an integral part of the decision process when choosing who to employ or who is deserving of a loan. Indeed, taking race and gender out of the decision equation may arguably lead to more efficient decisions, benefiting both citizens and suppliers in the long run.[184] The same cannot be said for giving weight in one's pricing decisions to the prices (or trade terms) set by rivals, and the expected reaction of rivals to one's own changes in price.

Now assume that, in line with the above, algorithms are allowed to give some weight to the prices of others or to market reactions to their own prices. As noted above, the inability to directly detect rivals' price levels does not, by itself, limit the ability of the algorithm to react to changing market conditions, thereby reacting to prices indirectly. So the regulator might need to interfere further in the elements that determine the price. But, more fundamentally, how much weight should the algorithm be allowed to give to market reactions to its prices to create efficient long-term entry and investment incentives in

179. R. J. GILBERT, INNOVATION MATTERS: COMPETITION POLICY FOR THE HIGH-TECHNOLOGY ECONOMY (2020).

180. Carlton et al., *supra* note 73, at 429; Posner, *Review*, *supra* note 123, at 763 ("And might not entry into cartelized markets be deterred because an entrant who having successfully entered such a market charged the prevailing market price might be prosecuted as a tacit colluder?").

181. Posner, *Review*, *supra* note 123, at 763–64.

182. Calvano et al., *Protecting Consumers, supra* note 17, at 1042.

183. Posner, *Review, supra* note 123, at 763–64; *see also* Harrington, *supra* note 110.

184. *See, e.g.*, GARY BECKER, THE ECONOMICS OF DISCRIMINATION (2d ed. 1971).

oligopolistic markets? No economic theory provides clear answers. The ability to react to prices set by rivals creates both positive incentives (e.g., entry, investment), and negative effects (e.g., coordination), which are not easy to separate. Yet the court will need to determine the allowable parameters as well as how vigorously the firms must compete in order to avoid being found to have engaged in illegal oligopolistic coordination.[185] For example, should the algorithm's pricing be based on 50% reliance on the prices of rivals and 50% reliance on other factors (such as cost)—would this be deemed legal? Or—from a different perspective—how far from the most efficient supra-competitive oligopolistic price equilibrium should the algorithm set the price for it not to be considered illegal? That would require the regulator to determine, inter alia, under which conditions such a supra-competitive price should be calculated, as well as to neutralize any effects of potential differences in quality or monopolistic competition that affect the price. If the goal is to mandate that firms price products based on their own production costs, at competitive levels, then is it not better to simply make these the only parameters that can be taken into account? But such limitations suffer from all the known maladies of price regulation.[186] Furthermore, they require firms to base their prices on factors which might be difficult for them to calculate (for example, where several products supplied by the firm use the same internal service).[187]

The above discussion leads to the following observation: if we could assume that market participants as well as regulators have good tools to detect pure oligopolistic coordination, we might consider prohibiting firms from setting the maximal supra-competitive coordinated price, as well as a predetermined range of prices below it—a "red" collusive price zone into which firms would be prohibited from entering. As long as the prohibited price zone is not too wide, effects on entry and investment might not be strong, and consumer welfare might well be increased. Yet the assumption that we could differentiate pure price coordination from other reactions to market settings (including industry-wide upward pricing adjustments that react to changes in demand) is, at least currently, not practical.

While the discussion may increase our frustration with our inability to regulate oligopolistic coordination directly, we are not completely empty handed. In line with the discussion in Section III, while we do not have good remedial tools for limiting pure oligopolistic coordination, the same justification does not carry over to facilitating practices that enable the pricing

185. Posner, *Review*, *supra* note 123, at 764.

186. *See, e.g.*, EXCESSIVE PRICES AND COMPETITION LAW ENFORCEMENT (F. Jenny & Y. Katsoulacos eds., 2020).

187. *See id.*

algorithm to reach coordination faster, better, or in more cases, with no offsetting pro-competitive effects. For example, if the algorithm is taught coordination strategies, or is given focal points for coordination, in order to speed its learning, this should be prohibited. It is also time to explore how far the facilitating practices prohibition will carry, and potentially stretch its current limits. For example, exploring whether, if algorithms choose a focal point for coordination (such as a historical price or a delivered price) rather than simply reacting to market conditions, such conduct should amount to a facilitating practice.

While decentralized pricing may not work well in the algorithmic age, we still do not have a better tool for setting prices. Indeed, as shown, some traditional objections to limiting human oligopolistic coordination still carry weight in the age of algorithmic coordination. The only conditions which have changed is that it has become more prevalent, and equilibriums will be achieved faster, and become more stable.[188] As shown, even the increased ability to potentially interfere in the pricing process which leads pricing algorithms to engage in oligopolistic coordination, unfortunately does not reduce the frustration of antitrust with its inability to efficiently regulate oligopolistic coordination. In the absence of an ability to specify a superior alternative, it may be best not to interfere with the code, at least until we have better models of market conduct.

D. HARM-BASED PROHIBITIONS

Some scholars suggest replacing decisional rules based on agreement with harm-based prohibitions, focusing on the supra-competitive price itself.[189] Such rules can treat harm as a basis for illegal conduct. Alternatively, they can follow Turner's suggestion to apply forward-looking no-fault regulation.[190] Yet to create ex ante certainty, the regulator would have to determine what price is allowed, replicating the maladies of price regulation. Furthermore, for the reasons elaborated in the previous Section, the efficiency of market operations might be harmed.

E. EXTERNAL NUDGES

This category focuses on nudges that affect algorithmic coordination externally, creating internal incentives for a change of conduct without directly interfering with the design of the algorithm.[191]

188. Bernhardt & Dewenter, *supra* note 30, at 329.

189. NICOLAS PETIT, SUBMISSION TO THE FTC HEARINGS ON COMPETITION AND CONSUMER PROTECTION IN THE 21ST CENTURY (2018).

190. Turner, *The Scope*, *supra* note 169, at 1231.

191. *Id.* at 165–67.

Beneke and Mackenrodt suggest imposing high fines on firms that engage in algorithmic coordination. Should the fine be sufficiently high, firms would have incentives to include in the algorithm's input variables the possibility of such a fine being imposed—thus reducing the likelihood of the algorithm's decision processes arriving at a supra-competitive price.[192] This suggestion has many benefits. Yet it is only relevant to illegal algorithmic cartels and not to legal algorithmic coordination. For the same reason, suggestions such as offering rewards for whistleblowers,[193] raising awareness,[194] extending liability to designers and suppliers of pricing algorithms,[195] or empowering consumer organizations to initiate sector inquiries,[196] do little to help prevent algorithmic coordination.

Johnson et al. have suggested an interesting nudge.[197] They explore ways that online retail marketplaces can mitigate price coordination between third-party merchants that might be achieved through algorithmic coordination. Their model attacks the foundations of coordination, by making deviation from a coordinated price both more attractive and harder for the other coordinating firms to punish. Specifically, the platform shows fewer options to consumers, and chooses the options to be shown as follows: a firm that cuts its price today is rewarded by being shown not only today but also in one or more future periods, even if rivals then offer lower prices. In equilibrium, for properly sized future revenues, all firms compete to be shown, and the effect is a breakdown in coordination.[198] Platforms may be incentivized to operate in this fashion by their increased attractiveness to consumers (and therefore increased profits).[199] Alternatively, platforms could also be legally obligated to promote competition in their marketplaces. This interesting suggestion is limited, however, to platforms. Also, its welfare effects (including the effects of limiting the variety of options available to consumers) must be analyzed.

192. Francisco Beneke & Mark-Oliver Mackenrodt, *Remedies for Algorithmic Tacit Collusion*, 9 J. ANTITRUST ENFORCEMENT 123, 152 (2021).

193. Aleksandra Lamontanaro, *Bounty Hunters for Algorithmic Cartels: An Old Solution for a New Problem* 30 FORDHAM INTELL. PROP., MEDIA & ENT. L.J. 1259, 1302–07 (2020).

194. Gautier, Ittoo & Van Cleynenbreugel, *supra* note 115, at 430.

195. Barbora Jedlickova, *Digital Polyopoly*, 42 WORLD COMPETITION 309, 329–30 (2019); DONINI, *supra* note 3, at 93–94.

196. MARC WIGGERS, ROBIN A. STRUIJLAART & JOHANNES DIBBITS, DIGITAL COMPETITION LAW IN EUROPE: A CONCISE GUIDE, 105 (2019).

197. Justin Pappas Johnson, Andrew Rhodes & Matthijs Wildenbeest, *Platform Design when Sellers Use Pricing Algorithms* (Cornell Univ., Working Paper No. 1146, 2021).

198. *Id.* at 9 (for consumers to benefit from limited choice, it is crucial that such a policy causes firms to make procompetitive decisions that they otherwise would not).

199. *Id.* at 26–27.

Finally, Hulicki suggests employing government-operated algorithms to set market-clearing prices, to prevent inefficient pricing.[200] Beyond the immeasurable informational problems involved in setting such prices, this amounts to direct regulation.

Interestingly, some remedies that were suggested with regard to human oligopolistic coordination are no longer raised with regard to algorithmic coordination. Famously, a 1968 White House Task Force Report on Antitrust Policy suggested a de-concentration approach: breaking up the largest firms in highly concentrated markets, in order to artificially introduce more competition into oligopolistic markets.[201] While this remedy may be problematic on many grounds, algorithms strengthen its inefficiency, due to the fact that coordination can be sustained in less concentrated markets, a point we return to in the discussion regarding merger policy.

V. FOUR INNOVATIVE REMEDIES

These limitations of existing and proposed solutions highlight the need to envision remedial roads not taken. In the following Sections, I propose four innovative remedies. One is market-based, while the others require regulatory intervention. Three of the solutions employ algorithms to limit harms created by other algorithms.

All of these suggestions attempt to indirectly influence market conditions in order to introduce stronger competitive pressures on the supply side or by creating countervailing market power on the demand side, rather than placing direct limits on the ability of firms to engage in autonomous algorithmic coordination. The reason relates to the discussion above: we do not have a good theory of which degree of reliance on one's rivals' prices is optimal for creating efficient incentives for firms to invest in productive and dynamic efficiency.

A. INTRODUCING A COUNTER-FORCE: ALGORITHMIC CONSUMERS

Let us start with a partial solution that can be provided by the market. In his famous book *Exit, Voice, and Loyalty*, Albert Hirschman explored two ways in which consumers can respond to deteriorating quality in a market: withdraw from the relationship ("exit") or voice their discontent in an attempt to repair the relationship ("voice").[202] Here we suggest a third way: creating a

200. Hulicki, *supra* note 134, at 252.

201. Reprinted in 2 ANTITRUST L. & ECON. REV. 11 (1968–1969). It was based on the work of CARL KAYSEN & DONALD F. TURNER, ANTITRUST POLICY-AN ECONOMIC AND LEGAL ANALYSIS 27 (1959); Turner, *The Scope*, *supra* note 168, at 1231.

202. *See generally* ALBERT O. HIRSCHMAN, EXIT, VOICE, AND LOYALTY: RESPONSES TO DECLINE IN FIRMS, ORGANIZATIONS, AND STATES (1970).

counterforce that would change market dynamics, in the form of algorithmic consumers. These are algorithms, operated by consumers, consumer groups, or third parties, that make purchase decisions on behalf of consumers and act as agents for buyers.[203] This solution involves the use of algorithms on the demand side to disrupt algorithmic coordination on the supply side. One of their main benefits is that they do not require direct regulatory intervention in the decisions of pricing algorithms or those of algorithmic consumers.[204] Gal and Elkin-Koren have developed this suggestion mainly with regard to dealing with unilateral market power, but it may also be useful to fight multilateral market power.[205]

Beyond the reductions they might offer in search and transaction costs, algorithmic consumers can help limit algorithmic coordination in several ways. All models of algorithmic coordination assume that transactions take place at prices exhibited online, which are transparent to all, and that most transactions are small and frequent, implying that consumers do not have buying power. Algorithmic consumers can challenge both assumptions. By aggregating consumers into buying groups, they can increase the size and reduce the frequency of transactions with each seller made through them. This can be done through the creation of a buying platform operated by one algorithm or by several algorithmic consumers joining forces. The available technology makes the formation of buying groups easier than ever. [206] Moreover, consumers need not all have similar preferences with regard to products they wish to buy for algorithmic consumers to have buyer power.[207] The business models of such automated buyer groups can be based, for example, on a small percentage of the costs saved.

Where algorithmic consumers have buying power, they can potentially break coordination between sellers by introducing another element into each supplier's decision-making: the ability to supply a large quantity at lower price. The resulting increase in the profits can potentially weaken the stability of the

203. Michal S. Gal & Niva Elkin-Koren, *Algorithmic Consumers*, 30 HARV. J.L. & TECH. 309, 310 (2017).

204. Some indirect regulation may nonetheless be required—for example, to ensure that consumers who use such algorithms can capitalize on their collective bargaining position without infringing antitrust laws. *See id.* at 340–52.

205. *Id.* at 341, 345.

206. *Id.* at 331–32.

207. Buyer power refers to the ability of buyers to influence the terms of trade with their suppliers. Joint buying algorithms may generate significant market power for consumers if a significant proportion of buyers choose to make their purchases through them. *See* OECD, DAF/COMP (2008) 38, MONOPSONY & BUYER POWER 9 (2009). Buyer groups are established to take advantage of economies of scale and scope. *See* Peter C. Carstensen, *Buyer Cartels Versus Buying Groups: Legal Distinctions, Competitive Realities, and Antitrust Policy*, 1 WM. & MARY BUS. L. REV. 1, 13–14 (2010).

coordinated conduct. Alternatively, should algorithmic consumers represent a sufficiently large number of consumers, they could negotiate a deal outside the digital sphere. Such external deals need not affect the price exhibited online, and thus may not be known to other suppliers. This implies that others will not retaliate, thereby increasing the incentives of the deviating supplier to agree to such a deal.[208] By reducing demand for other players, such external deals will also introduce "noise" into the ability of supplier algorithms to separate reductions of demand that result from deviations of rivals from the supra-competitive equilibrium, and those that result from external market conditions.

Given their analytical sophistication, algorithmic consumers can test, devise, and apply other strategies to motivate suppliers to reduce prices. Thus, they can take advantage of the benefits of AI to assist consumers, rather than suppliers. For example, while each consumer's demand may be inelastic, their cumulative demand could become elastic. Hence, algorithmic consumers could decide not to buy beyond a certain price. Algorithmic consumers could also delay demand signals, which could then lower prices.[209] In doing so, algorithmic consumers reduce consumers' collective action problem.[210]

Finally, and no less importantly, algorithmic consumers may reduce the extent of network effects, thereby potentially reducing the efficient size of market participants and creating more fragmented and contestable markets, which might be less prone to coordination. This claim is based on the nature of network effects, which arise when one's value from the use of a certain product increases with the number of other users of the same product. Take, for example, a platform that hosts numerous suppliers. The consumer can enjoy the one-stop-shop and the ability of the platform to compare among suppliers and provide him with the best results according to his preferences. Now compare this to multi-homing. Should the consumer need to compare offers of different products offered on several different platforms, it might take him a much longer time to explore all offers. More importantly, it might not be as easy for him to compare offers from different networks. But what if an algorithmic consumer were, instead, to engage in such tasks efficiently and cheaply? Then the size of the network would be less relevant.

208. Note, however, that this solution might require human involvement.

209. Myklos-Thal & Tucker as well as O'Connor & Wilson find that more precise demand estimation generally impedes collusion. Miklós-Thal & Tucker, *supra* note 97; Jason O'Connor & Nathan E. Wilson, *Reduced Demand Uncertainty and the Sustainability of Collusion: How AI Could Affect Competition*, 54 INFO. ECON. POL'Y (2021). *But see* Harrington, *supra* note 51, at 3 (finding a different result when the pricing algorithm is not designed by the firm but by a third party).

210. This assumes, of course, that those using the algorithm have the flexibility to wait until the supplier changes its terms. Nonetheless, a supplier anticipating the market power of an algorithmic consumer might change its terms a priori.

Of course, such a solution has limitations.[211] For instance, algorithmic consumers risk creating a monopsony, either via unilateral market power or where several algorithmic consumers coordinate their conduct. The short-term consequences of the exercise of such market power are distributive, as the buyer captures more of the surplus from the trade. Total surplus and efficiency are unaffected because the quantity of inputs brought to market is the same as under competition. In the long run, however, the monopsonist's extraction of surplus may discourage entry by suppliers, which could impact consumers through reduced supplier competition.[212] To reduce such effects, such power is subject to antitrust limitations.[213] But more importantly, two points of control critically shape algorithmic consumers' ability to operate in markets: access to relevant data and access to potential users.[214] Let us first relate to the former. To use a common example, the requirement on many websites that users prove they are "not a robot," limits the ability of algorithmic consumers to operate. In fact, a middleware market for "bot mitigation" technology has emerged.[215] While such technology is generally used to hinder automated data scraping by sellers, it can equally be used to block activity by algorithmic consumers. Limitations on such technology might then need to be set by the regulator.[216] Furthermore, as Van Loo has suggested, mandatory disclosure of pricing and product data might even be requited in some settings.[217] Gal and

211. For elaboration, see Gal & Elkin-Koren, *supra* note 203, at 322–25 (analyzing efficiency-related shortcomings); Michal S. Gal, *Algorithmic Challenges to Autonomous Choice*, 25 MICH. TECH. L. REV. 59 (2018) (analyzing autonomy-related shortcomings).

212. Roger Noll, *Buyer Power and Economic Policy*, 72 ANTITRUST L.J. 589, 606 (2005).

213. Gal & Elkin-Koren, *supra* note 203, at 331–34.

214. *Id.* at 334.

215. Klint Finley, *'Scraper' Bots and the Secret Internet Arms Race*, WIRED (July 23, 2018, 7:00 AM), https://www.wired.com/story/scraper-bots-and-the-secret-internet-arms-race/.

216. The Supreme Court has recently dealt with the issue of content scraping in *LinkedIn Corp. v. hiQ Labs, Inc.*, 141 S. Ct. 2752 (2021). LinkedIn informed HiQ that it was not permitted to scrape data from public profiles of its users available on its website. HiQ argued that it required access to the data to compete. The Court vacated the Ninth Circuit's decision to enable such access and remanded for reconsideration in light of its recent decision in *Van Buren v. United States*, 593 U.S. (2021), which focused on the Consumer Fraud and Abuse Act. On remand, the Ninth Circuit found such scraping to be legal, as there was no unauthorized use of a computer. *HiQ Labs, Inc. v. LinkedIn Corp.*, 31 F.4th 1180 (9th Cir. 2022).

217. Rory Van Loo, *Helping Buyers Beware: The Need for Supervision of Big Retail,* 163 U. PA. L. REV. 1311, 1330 (2015) (proposing legal reforms that would enable third-party pricing tools that would counter sellers' pricing sophistication by enabling the pricing tool to "aggregate prices from all relevant brick-and-mortar and online retailers and run sophisticated algorithms to create optimized shopping itineraries from which the consumer could choose").

Rubinfeld have suggested that some form of data standardization might also be required in some settings.[218]

Let us now relate to access to potential users. In today's digital world, access to intermediary platforms is generally essential to reach users (for example, through an app store). As a result, digital intermediaries can affect which algorithmic consumers reach potential users and on what terms. Furthermore, given that algorithmic consumers may become users' gateway into the digitized marketplace, platforms may attempt to provide and control such algorithms.[219] Indeed, the major digital platforms are already racing to develop digital shopping assistants.[220] Their motivation to do so is strengthened by the fact that in aggregating consumers' data, algorithmic consumers obscure the preferences of individual consumers, thereby harming the business models of platforms whose value depends on such data. The more important the access to the unique data held by the intermediary, the more likely that platforms will attempt to control or regulate such access.[221] This, in turn, strengthens the importance of regulation designed to limit the creation of artificial barriers blocking access to both data and consumers, and to ensure that consumers are getting the bulk of the benefits, rather than intermediaries.[222]

Algorithmic consumers could also generate new harms and risks, such as limiting consumer choice and autonomy, increasing consumers' vulnerability to inefficient decisions made on their behalf, and raising the risk of cyber-security harms. Their use may also have psychological and social implications. All of these are beyond the scope of this paper, and have been partly addressed elsewhere.[223]

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218. Michal Gal & Daniel L. Rubinfeld, *Data Standardization*, 94 NYU L. REV. 737, 749–51 (2019).

219. Ariel Ezrachi & Maurice E. Stucke, *Is Your Digital Assistant Devious? In* RECONCILING EFFICIENCY AND EQUITY: A GLOBAL CHALLENGE FOR COMPETITION POLICY 220 (Damien Gerard & Ioannis Lianos eds., 2019).

220. *See* Mark Prigg, *Apple Unleashes Its AI: 'Super Siri' Will Battle Amazon, Facebook and Google in Smart Assistant Wars*, DAILY MAIL (June 13, 2016), http://www.dailymail.co.uk/sciencetech/article-3639325/Apple-unveil-SuperSiri-Amazon-Google-smart-assistant-wars.html.

221. EZRACHI & STUCKE, *supra* note 14, at 191–92.

222. For a suggestion to apply agency law to voice shoppers, see, e.g., Noga Blickstein-Shchory & Michal Gal, *Voice Shoppers: From Information Gaps to Choice Gaps in Consumer Markets*, 88 BROOKLYN L. REV. 111, 143–61 (2022); *see also* Rory Van Loo, *Rise of the Digital Regulator*, 66 DUKE L.J. 1267 (2017) (suggesting the application of oversight mechanism to algorithmic regulators).

223. *See, e.g.,* Gal, *supra* note 211, at 80–90 (focusing on harms from loss of autonomous choice).

B. MERGER REVIEW: WHEN THE EXCEPTION BECOMES THE RULE

The Article now turns to exploring remedies that require direct governmental intervention. We start with the one that strays the least from conventional regulation: merger review. Merger regulation was traditionally seen as the main tool in our arsenal to limit oligopolistic coordination, the same type of conduct which underlies algorithmic coordination.[224] As elaborated below, merger regulation can still be used to limit some instances of the latter, but to do so some of its presumptions need to change in a subset of cases where market conditions seem conducive to algorithmic coordination.[225] Many of the suggestions made here also pertain to the regulation of joint ventures.

On its face, algorithmic coordination makes merger review less relevant. This is because algorithmic coordination may reduce firms' incentives to merge. That is, if coordination can be facilitated by algorithms under a wider range of market conditions, with the resulting equilibriums even more stable than before, then firms have weaker incentives to merge to increase their profits via coordination.[226]

Algorithmic coordination also makes some merger tools less effective. One of the main tools in the merger review arsenal involves preserving asymmetries and heterogeneities between market participants.[227] Doing so, it is believed, protects competition by making it harder for firms to coordinate. Yet if algorithms can at least partially overcome some of these traditional obstacles to coordination, then preserving such market conditions would not have a significant effect on competition.[228]

Still, merger review has an important role to play. Its wide scope for inquiry, the fact that it is outcome-based rather than process-based, and the

224. *See, e.g.*, Nicolas Petit, *The Oligopoly Problem in EU Competition Law*, *in* HANDBOOK IN EUROPEAN COMPETITION LAW (Ioannis Liannos & Damien Geradin eds., 2013).

225. For an outstanding analysis of some of the effects of algorithmic coordination on merger policy, see Coutts, *supra* note 26.

226. Ariel Ezrachi & Maurice E. Stucke, *Two Artificial Neural Networks Meet in an Online Hub and Change the Future (Of Competition, Market Dynamics and Society)* (Univ. Tenn. Coll. L., Legal Stud. Rsch. Paper Ser. No. 323, 2017).

227. *See, e.g.*, DEP'T JUST. & FED. TRADE COMM'N, HORIZONTAL MERGER GUIDELINES ¶ 7 (1997) *see also* U.K. COMPETITION & MKTS. AUTH, MERGER ASSESSMENT GUIDELINES ¶ 5.5.11 (2010).

228. *See* Coutts, *supra* note 26, at 15–22 (arguing, for example, that algorithms can mitigate market complexity by determining focal points or understanding "invitations to collude" that a human could not; by reacting in a speedier way; and steering firms towards pricing strategies that take a long-term view of profitability when balancing the prospects of short term and long-term gains). Algorithms may assist in overcoming asymmetry among would-be colluders through better estimation of competitors' otherwise private information, by reconciling competing incentives and preferred equilibria, and by easing the implementation of an effective reward/punishment scheme amongst asymmetric firms. *Id.*

flexibility of its potential remedies all increase its potential effectiveness.[229] Its importance is further strengthened by the fact that algorithmic coordination is not captured by any other existing regulatory tool, and by the fact that it does not involve prohibiting or declaring the use of the algorithm (or part thereof) as illegal. I suggest that merger review can play a double, interconnected role. First, merger review should be used to prohibit mergers that increase algorithmic coordination without offsetting benefits. Second, remedies should be designed to give more weight to the possibility of algorithmic coordination. Incorporating these considerations might increase uncertainty and require authorities to expend more resources determining the actual potential for and effects of algorithmic coordination on welfare. But disregarding them might be a far worse option.

Some parts of the existing merger guidelines, or the way they are applied in practice, fit well with the need to consider the possibility of algorithmic regulation, such as the requirement to analyze whether the post-market conditions would be more conducive to coordination. Nonetheless, algorithmic coordination may need to be further reflected in two main ways: (1) in the change of relevant presumptions (such as with regard to the importance of asymmetry in the market to reduce coordination); (2) in the active analysis of the potential for algorithmic coordination, where algorithmic coordination is already prevalent or is potentially profitable.

Let us elaborate. We start with suggestions that pre-merger notification thresholds should be rethought and attuned to coordination in the age of algorithmic pricing.[230] Currently, mergers need to be reported to the antitrust authorities only if they meet a preset *financial turnover*.[231] In the presence of algorithmic coordination this might be insufficient, allowing some mergers that increase algorithmic coordination to fall under the radar. Consider two examples. In the first, the acquired firm has limited financial turnover but its algorithm acts as a maverick, disrupting the coordinated equilibrium. In the second, the acquired firm's algorithm or dataset constitutes its main competitive asset. As elaborated below, a better algorithm, or a better dataset to train the algorithm on, could better facilitate algorithmic coordination. Yet the owner might have limited financial turnover, inter alia because the algorithm or dataset has not yet been used commercially—whether as a strategic decision, to ensure that the merger is not captured under current merger review thresholds,[232] or because the owner does not have the ability to

229. *See id.*

230. Ezrachi & Stucke, *supra* note 226, at 46; Coutts, *supra* note 26.

231. 15 U.S.C. § 18a (2021) (the current version of Clayton Act 7A).

232. Merger control enables the antitrust authorities to review mergers which did not meet the benchmark for reporting. Yet the authorities might not be aware of such mergers.

enjoy their potential. In such cases, the German solution for detecting "killer acquisitions" is valid here as well: adding a category to merger review thresholds based on the absolute value of the transaction.[233]

Turning to structural presumptions used to screen mergers, so far, prohibiting a merger based on coordinated effects has been the exception. There are two main reasons: (1) there are no definite models on which market conditions facilitate coordination, and (2) it is generally assumed that oligopolistic coordination can take place only in extreme cases, where the market is highly concentrated, and firms are relatively homogenous in size. Accordingly, concentration parameters are given substantial weight in determining intervention thresholds.[234] The level at which these parameters are set is based on the assumption that mergers in markets with more than three players will not be prone to coordination.[235] Algorithmic coordination challenges these assumptions, given the algorithms can potentially increase the number of firms that can potentially coordinate effectively. Thus, we should explore the possibility that high levels of concentration—and their indicators—should be given less weight in markets prone to algorithmic coordination.

Relatedly, levels of concentration which serve as thresholds for intervention might need to be lowered. How low such thresholds should be set, and under what market conditions, should be based on careful economic analysis. The OECD recommended that the threshold be lowered to capture even five-to-four transactions.[236] Ezrachi and Stucke suggested to lower it to five-to-six significant players.[237] Under some market conditions algorithms may enable coordination even beyond such thresholds. Take, for example, follow-the-leader pricing algorithms in markets where price matching is instantaneous, so that the immediate benefits to one rival of lowering prices are miniscule.[238] Furthermore, Coutts suggests that determining such levels should also relate to other market conditions, such as transparency and frequency of interaction, which affect coordination.[239] This implies that intervention thresholds might have to be more sensitive to industry-specific

233. FEDERAL CARTEL OFFICE (BKARTA) & FEDERAL COMPETITION AUTHORITY (BWB), GUIDANCE ON TRANSACTION VALUE THRESHOLDS FOR MANDATORY PRE-MERGER NOTIFICATION (SECTION 35 (1A) GWB AND SECTION 9 (4) KARTG) (July 2018); Claire Turgot, *Killer Acquisitions in Digital Markets: Evaluating the Effectiveness of the EU Merger Control Regime*, 5 EUR. COMPETITION & REG. L. REV. 112, 118 (2021).

234. U.K. COMPETITION & MKTS. AUTH, *supra* note 227, ¶ 1.5.

235. *Id.*

236. OECD, *supra* note 10, at 41.

237. Ezrachi & Stucke, supra note 226, at 31.

238. Gal, *supra* note 38, at 85–86.

239. Coutts, *supra* note 26.

conditions, and may even be dynamic. This implies, of course, that more regulatory and private resources should be spent on merger control. Accordingly, it should only be applied in those markets in which conditions are rife for algorithmic coordination and there is wide(ning) use of such algorithms.

Let us now turn to the factors that play a role in a more in-depth analysis of the potential harms of the merger. The antitrust agencies' Horizontal Merger Guidelines clearly state that they "will examine the extent to which post-merger market conditions are conducive to reaching terms of coordination, detecting deviations from those terms, and punishing such deviations."[240] They are thus sufficiently wide to take into account the possibility and potential effects of algorithmic coordination. Yet they would need to be attuned to this possibility. As noted above, as a result, some mergers might be allowed to go through. Yet, in other cases, the increased potential for algorithmic coordination might require prohibiting mergers that would have otherwise been allowed. Let us explore five relevant scenarios.

In the first scenario, the merger will shorten the time needed to reach coordination. To illustrate, assume a market with five market players. Three adopt a follow-the-leader pricing algorithm, while two adopt learning algorithms which are given the task of price maximization. As Calvano et al. found, even in a lab setting, it took learning algorithms a long time to coordinate.[241] But if the merger takes one learning algorithm out of the game, coordination may be more easily achieved. One question to ask is why one of the firms did not simply also switch to a follow-the-leader algorithm in the pre-merger situation. The answer might be based on trust issues, on ensuring that the leader actually sets the best prices, or even on the assumption that a learning algorithm is less prone to regulatory scrutiny.

In the second scenario, market dynamics are changed by the acquisition of a firm for its dataset, on which the algorithm is run or trained.[242] In such cases data can be likened to the input for the production facility (the algorithm). One of the main obstacles to coordination recognized in the economic literature is that market players cannot easily distinguish between changes in market conditions that result from external factors, and those that result from an

240. U.K. COMPETITION & MKTS. AUTH, *supra* note 227, ¶ 2.1 (emphasis added).

241. Calvano et al., *Artificial Intelligence, supra* note 17.

242. The importance of algorithms and data as important parameters in merger review have already been recognized. *See, e.g.*, Anca Chirita, *Data-Driven Mergers Under EU Competition Law*, *in* THE FUTURE OF COMMERCIAL LAW: WAYS FORWARD FOR HARMONISATION 147 (John Linarelli & Orkun Akseli eds., 2019); MARIA WASASTJERNA, BIG DATA AND PRIVACY IN MERGER REVIEW - COMPETITION POLICY FOR THE 21ST CENTURY DIGITAL ECONOMY (2020).

attempt to deviate from the coordinated equilibrium.[243] Where a dataset creates better knowledge that makes it easier to differentiate between these factors, coordination may be more efficient. Finally, a merger leading to more homogenized and accurate input data might strengthen the incentive of other firms in the market to use follower-leader pricing algorithm.[244]

The third scenario involves the acquisition of a firm for its algorithm. Should the algorithm not otherwise be easily transparent in the pre-merger scenario, such a merger can reduce uncertainty concerning how a rival sets his prices. Alternatively, acquiring an efficient algorithm can shorten the time needed to reach coordination. Finally, an efficient algorithm, which reduces the need for data, may increase firms' ability to coordinate in complex situations. Interestingly, the British Competition and Markets Authority already recognized such effects when weighing whether to approve Amazon's acquisition of a minority shareholding in Deliveroo.[245] As part of their submissions, the merging parties had to show that their algorithms were differently structured and optimized.

The fourth scenario relates to conglomerate mergers, which are generally assumed to be benign, and thus are rarely prohibited. The sophistication of algorithms can change this. As Donini suggests, since pricing algorithms can respond to punishment mechanisms even in distinct product industries through multi-market contacts,[246] antitrust authorities should more carefully scrutinize conglomerate mergers, particularly those between firms offering the same type of product in different geographic markets.[247]

Finally, the use of sophisticated algorithms in the industry can affect the merger counterfactual. That is, the hypothetical scenario which is assumed to exist should the merger not be allowed to take place. Take, for example, asymmetry. Under some circumstances, pricing algorithms can increase the incentives and ability of asymmetric firms to coordinate. This is because algorithmic modeling can help firms understand their asymmetric competitors as well as the prevailing demand conditions, which simplify the process of establishing a supra-competitive equilibrium.[248]

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243. Beneke & Mackenrodt, *supra* note 192, at 126–27.

244. Ai Deng & Christian Hernandez, A*lgorithmic Pricing in Horizontal Mergers: An Initial Assessment*, 32 ANTITRUST (2022).

245. UK COMPETITION & MKTS. AUTH., ANTICIPATED ACQUISITION BY AMAZON OF A MINORITY SHAREHOLDING AND CERTAIN RIGHTS IN DELIVEROO: FINAL REPORT ¶ 46 (2020).

246. Federico Ciliberto & Jonathan W. William, *Does Multimarket Contact Facilitate Tacit Collusion? Inference on Conduct Parameters in the Airline Industry* 45 RAND J. ECON. 765 (2014).

247. DONINI, *supra* note 3, at 105.

248. Coutts, *supra* note 26, at 28.

Algorithmic coordination also affects presumptions relating to potential efficiencies. If firms can achieve high profits through algorithmic coordination, under some conditions they might prefer this over a merger (e.g., because it is legal and thus not subject to regulatory scrutiny). In that case, ceteris paribus, firms that merge are more likely to do so for other reasons, such as to realize efficiencies. This is because if both a merger and a coordinated scheme can raise prices, the difference in control rights of the owners in both cases leads to a stronger probability that the merger route was chosen because it will better enable the realization of scale and scope economies, where they exist.[249] Imagine an industry where the minimum efficient scale supports three players, but algorithmic coordination can sustain six players. From a welfare perspective, it might be better to have three players, operating at efficient levels, to reduce productive inefficiency. This should not lead, however, to a "hands off" merger approach, but only to recognition of the possibility that the merger is not designed only to increase prices.

The above analysis implies that there is a need to develop more nuanced evaluations of mergers that might lead to algorithmic coordination, while also ensuring a sufficient level of certainty. The task is not an easy one. One of the reasons mergers are rarely prohibited due to their potential effects on coordination is that there are no bright lines that determine when a market will be prone to coordination. Instead, economic analysis recognizes factors that might lead to coordination and general tendencies.[250] Algorithmic coordination further complicates the analysis. One suggestion, made recently by the UK's Digital Competition Expert Panel, is for a balance of harms approach, which would consider both the likelihood and the magnitude of the merger's impact. This would involve an overall assessment based on potential risks under all factual and counterfactual scenarios.[251] Of course, this suggestion does not fully resolve the problem, as counterfactuals may be difficult to evaluate. Yet once data scientists and computer scientists are added to investigatory teams and competition authorities create more rigorous tools to evaluate the effects of mergers in markets where pricing algorithms are common, and even to monitor behavioral remedies in the post-merger world, these tasks might seem a bit less formidable.

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249. *See* George Baker, Robert Gibbons & Kevin J. Murphy, *Strategic Alliances: Bridges Between "Islands of Conscious Power,"* 22 J. JAPANESE & INT'L ECON. 146 (2008) (classifying organizational forms that differentiate between a merger, a strategic alliance, and a joint venture).

250. U.K. COMPETITION & MKTS. AUTH, *supra* note 227, ¶ 2.12.

251. DIGIT. COMPETITION EXPERT PANEL, UNLOCKING DIGITAL COMPETITION (2019), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785547/unlocking_digital_competition_furman_review_web.pdf.

As Coutts convincingly argues, the potential for algorithmic coordination should also affect the *pre-merger procedure*: care should be taken to limit abuses of this procedure.[252] Under certain circumstances, disclosure of a pricing algorithm may contravene antitrust prohibitions on the sharing of competitively sensitive information.[253] While such disclosure might be required to expose the assets that may create value, it could also increase algorithmic coordination through signaling, or by reducing the need for experimentation and uncertainty where the algorithm is not otherwise directly transparent.[254] Such exposure might have long-term effects even if the merger is abandoned. In fact, in such a case, antitrust authorities would generally not even know that a merger was contemplated, because there is no reporting requirement. Firms could abuse this fact, exposing their algorithms and datasets under the guise of a potential merger, without seriously contemplating one.[255]

To address such issues, Coutts suggests that due diligence be structured to increase the sensitivity of certain types of information that would ordinarily be permissible to disclose.[256] For example, ordinarily, information becomes less competitively sensitive as it becomes less current. Yet a dataset on past market conditions could reduce welfare if it facilitates algorithmic coordination. This might imply that absent strong pro-competitive justifications, firms should be permitted only to expose the level of revenue their algorithm generates above costs, but not the actual content of the algorithm. Or they may be allowed to expose the algorithm or the dataset only to a third party. While theoretically such conduct might be captured as facilitating practices, the fact that it might be justified as part of a due diligence process could limit this possibility.

Finally, as Coutts suggests, algorithmic coordination makes structural remedies less effective. As he contends, increasing asymmetries reduces the likelihood of coordinated effects but raises the likelihood of unilateral effects, and vice versa.[257] Accordingly, where pricing algorithms are ubiquitous, the propensity for symmetric remedies backfiring increases significantly. This is because increasing the symmetry of market participants in order to address concerns of unilateral effects (or coordinated effects vis-à-vis asymmetric price

252. Coutts, *supra* note 26.

253. *Id.*

254. *Id.*

255. *Id.*

256. *Id.*

257. Luke Garrod & Matthew Olczak, *Collusion under Imperfect Monitoring with Asymmetric Firms*, 65 J. INDUS. ECON. 654, 656 (2017).

leadership) might reduce consumer welfare than simply allowing the merger to proceed unmodified.[258]

As the above analysis shows, merger review tools can no longer disregard the potential for algorithmic coordination. On the one hand, this potential may weaken the justification for prohibiting mergers on the grounds that they increase concentration. On the other hand, merger review has an important role to play in limiting some situations where mergers increase the possibility of algorithmic coordination. As the antitrust authorities have recently announced that they are considering a revision of their merger guidelines,[259] there is no better time to consider incorporating in them the effects of algorithmic coordination. This is also the time to consider adding computer and data scientist to the antitrust authorities, and increase the financial resources in order to employ them.

Interestingly, it is not clear whether, in the long run, making merger analysis tools more sensitive to algorithmic coordination will increase or decrease merger review costs. This depends, inter alia, on whether the potential for algorithmic coordination under different market conditions will be found to imply that such coordination requires a more complicated and resource-intensive case-by-case analysis, or that preventing mergers is not effective in many markets, and so in-depth investigations should be limited to a sub-set of mergers in which it can be assumed that the merger will harm competition, like the cases explored above.

C. DISRUPTIVE ALGORITHMS: TURNING AUTOMATION INTO AUTONOMY

The Article now turns to two remedies that require active governmental intervention in market conditions. The first is the introduction of a disruptive algorithm. The idea behind this remedy is to use algorithms on the supply side to change market conditions in a way which makes it more difficult for algorithmic coordination to emerge. A basic insight from the economic theory of coordination is that "noise"—(perceived) changes in market conditions which may change the optimal equilibrium—makes coordination more difficult.[260] Deployment of a disruptive algorithm, which is given the task of

258. *Id.*

259. The British Competition and Markets Authority, for example, recognized the effects of algorithms on swiftness of response, as well as their being sensitive information about rivals that could be exposed during a merger. This is a first step in the right direction, but more careful analysis is still needed. U.K. COMPETITION & MKTS. AUTH, MERGER ASSESSMENT GUIDELINES 50, 53 (2021), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1051823/MAGs_for_publication_2021_—_.pdf.

260. Edward J. Green & Robert H. Porter, *Noncooperative Collusion under Imperfect Price Information*, 52 ECONOMETRICA 87, 94–95 (1984).

introducing noise, can potentially limit the ability of other algorithms to engage in coordinated conduct.[261] The interference is external and mimics the entry into the market of a maverick supplier that does not adhere to the coordinated equilibrium.[262]

The scheme is quite simple: as elaborated below, one supplier, who operates the disruptive algorithm, will be incentivized by consumers or by a regulator to charge lower, potentially competitive prices, for a period of time. The algorithms of other firms may then find it optimal to lower their prices as well, to the benefit of consumers. Otherwise, under the market conditions elaborated below, they will lose too many consumers for their higher prices to remain profitable. Indeed, as Assad et al. show in their empirical study of German gas retailers, for supra-competitive prices to arise under the conditions they studied, all firms must adopt pricing algorithms that seek to maximize profits.[263] This serves as an indication that a disruptive algorithm may limit supra-competitive coordination under some market conditions. It also leads to the observation that different markets might need different types of disruptions. Observe that price need not be the only parameter that can cause disruption. Other parameters might include, inter alia, better service conditions and lower prices of related products.

Disruptive algorithms can be operated by the regulator, but this is a tall order, given that the regulator has no capacity of supply and no expertise in the production and marketing of such products. A preferred solution is to subsidize one of the suppliers in the market. Why would a firm agree to cooperate?[264] A firm might expect to realize scale economies in the post-intervention period. But more importantly, each supplier faces a prisoner's dilemma. Firms must respond to the regulator's offer without knowing the intentions of competing suppliers. If all suppliers decline to cooperate, they can all maintain their supra-competitive prices. But if one supplier agrees to cooperate, his profits will be increased by the financial incentives offered by the regulator, while his rivals will incur losses. Each supplier is thus motivated to cooperate by the threat that another supplier would agree.

Disruptive algorithms can also be potentially operated by large consumers, consumer associations, or government-supported private firms. Yet

261. DONINI, *supra* note 3, at 115–16.

262. A version of this potential remedy was first suggested by Gal in the context of human oligopolistic coordination, but it may apply here as well, subject to necessary changes. Michal S. Gal, *Reducing Rivals' Prices: Government-Supported Mavericks as New Solutions for Oligopoly Pricing*, 7 STAN. J.L., BUS. & FIN. 73 (2001). Other scholars reiterated this potential remedy. *See, e.g.*, DONINI, *supra* note 3, at 61, 115–116; Michal Gal & Nicolas Petit, *Radical Restorative Remedies for Digital Markets*, 36 BERKELEY TECH. L.J. 617, 653–62 (2021).

263. Assad et al., *supra*, note 9, at 29.

264. Gal, *supra* note 262.

government funding might still be required, given the direct costs of operating such a disruptor and the fact that the positive externalities it creates will benefit all consumers, with no special advantages for the private entity operating the disruptor. Deployment of a disruptive algorithm has clear upsides. If successful, it introduces direct competition into the market. Furthermore, the threat of governmental intervention might, in itself, create incentives for firms to reduce price levels in their markets. In addition, it avoids determining which elements the firm can take into account when making its trade terms decisions, no firm is forced to act in a manner that contravenes its incentives, and there is no ongoing intervention except to check the price or trade terms set by the disruptive algorithm.

The success of such a remedy depends, inter alia, on how sensitive the pricing algorithms are to noise on the supply side. In particular, the disruptive algorithm must be able to challenge the market equilibrium. For other suppliers to find it in their interest to follow the disruptor's pricing strategy, three conditions must exist.[265] First, there must be a credible threat that the disruptor will attract consumers who were previously served by his rivals, should the latter not follow suit in reducing prices. If the disruptor has limited capacity for supply, and if this can be easily detected by other algorithms, it might still be profit-maximizing for the others to engage in algorithmic coordination at supra-competitive prices. For the scheme to work, either the disruptor's capacity must be quite large (or relatively easily enlarged), or its limited capacity must not be easily detected by competing suppliers. Note, however, that once the disruptor expands its capacity, the market will have to accommodate a larger-scale rival. If the expansion allows the disruptor to realize scale and learning economies not realizable by incumbents, the threat of increased capacity alone may stimulate firms to reduce prices.[266]

The second condition is relative product homogeneity.[267] If each supplier enjoys niche demand for a branded or highly differentiated product, the price of the disruptor's product may have to be reduced considerably in order to significantly affect the demand for competing products. The third condition dictates that the duration of the product's life-cycle should be longer than the time it will take the disruptor to expand its capacity.[268]

How long should the government subsidize the disruptor?[269] The optimal length of time will vary from one industry to another, depending on market conditions. In general, it should be the minimal period that is sufficient to

265. *Id.*
266. *Id.*
267. *Id.*
268. *Id.*
269. *Id.* at 21.

incentivize market participants to assume the role of the disruptor, and to produce significant losses for rivals that fail to reduce their prices. In particular, time frame considerations must include how long it will take the disruptor to expand its output and significantly erode the market shares of its rivals. However, the government need not convey to all market participants the length of time that it will subsidize the disruptor.

Another question is how large the compensation offered should be. The answer depends on market conditions and the position of the disruptive firm in the subsidy and post-subsidy periods. The higher the barriers to competition, the higher the necessary subsidy. Compensation need not equal the full costs of expansion, since the added capacity may allow the disruptor to enjoy scale economies both during the subsidization period and afterwards. It also depends on the price charged by the disruptive firm. It should also cover any costs foreseen by the disruptor of retaliation of its rivals in subsequent periods, once the regulatory intervention period is over. In addition, the choice of which firm to subsidize could be auctioned, thereby reducing the need to determine a priori the size of the compensation offered.[270]

Finally, incumbent suppliers should be given an opportunity to take voluntary steps to restore competition and limit intervention before the introduction of a disruptive algorithm. The mere threat that a disruptive algorithm—subsidized by consumers or the government—will be employed may by itself stimulate market participants to reduce their prices.[271]

This remedy is not without problems. It demands high technological skills, which might be in short supply. Furthermore, it raises concerns regarding its effects on market dynamics.[272] Specifically, it could interfere with firms' incentives to enter oligopolistic markets and make investments that may lead to productive and dynamic efficiency. By reducing firms' ex post ability to enjoy supra-competitive profits, the remedy might undermine ex ante investment incentives. Recall, however, that we are discussing a case where high prices result from coordination, not from better products. Firms in oligopolistic markets have no inherent right that market conditions that sustain their ability to charge high prices will exist forever. In this sense, the introduction of the disruptive algorithm can be likened to a reduction in import barriers into the market. Yet the concern remains that the remedy could overreach, going beyond restoring the market to a competitive state, and

270. *Id.* at 96–100.

271. *Id.*

272. Bernhardt & Dewenter, *supra* note 30, at 337.

producing distortions of its own to the market's pricing system.[273] Accordingly, before applying this remedy, the effect of the disruptor on the market should be analyzed and simulated. Here we may take advantage of the nature of algorithms, and the fact that their strategies can often be tested and therefore anticipated. Such tests may be performed on the actual algorithms used by firms, or simulated based on uncovering the rules that lead to coordination in that market and analyzing their potential interactions. Note that the experimental and empirical studies performed so far have all assumed that all algorithms are programmed to maximize the profits of their operator, and that noise in the system comes mostly from changes in market conditions, which are external to all market players. Such experiments can be potentially extended to test the effects of introducing a disruptor algorithm into the market, whose goal is to break the coordination and lead to a lower-price equilibrium.

A final problem is that deploying a disruptive algorithm requires the regulator to take an active role in changing market conditions.[274] By limiting the disruptive algorithm to one firm while leaving the pricing, output, and quality decisions of all other firms in their own hands, intervention is significantly limited. Nonetheless, this remedy should only be used where welfare effects are significant and no less-interventionist remedy can achieve equivalent results.

D. COMPETITION-BY-DESIGN: MANDATORY TIME LAGS

As observed above, prohibiting the use of all pricing algorithms, or those that facilitate price coordination, is highly problematic. At the same time, small changes in the environment in which the algorithms operate might go a long way toward securing competition, while not directly interfering in the algorithms' design. Accordingly, the idea behind the fourth remedy is to create an artificial time lag in a pricing algorithm's ability to respond to changes in market conditions. This idea should be treated as a thought exercise, rather than a call for action, given its institutional limitations noted below.

This solution builds on an idea that was introduced several decades ago by Edlin in another context—combating the negative effects on competition dynamics of predatory pricing by a monopolist, where prices are lowered in the short run in order to drive out a competitor and increase prices in the long run.[275] Edlin suggested that price reductions should trigger a freeze of the

273. For the importance of legally gained profits as a stimulant for competition and innovation, see Verizon Commc'ns, Inc. v Law Offs. of Curtis V. Trinko, LLP, 540 U.S. 398 (2004).

274. Gal & Petit, *supra* note 262, at 662.

275. Edlin, *supra* note 35, at 945–46.

monopolist's price, thereby making it costlier for him to reduce prices in the short run and so making a predatory pricing strategy less profitable.[276] Interestingly, Austria adopted a version of this solution in practice. As of 2009, petrol stations have been allowed to reduce prices immediately, but any price rise, as a reaction to a price change by a rival, is allowed only after twenty four hours.[277] The idea behind this law is that firms will be more reluctant to raise prices, if they know that for twenty four hours their price will be higher than their rivals thereby losing sales during that period. I build on this idea, flip it, and adapt it for algorithmic coordination. Here, the purpose of the price freeze is the opposite: to prevent the setting of high prices in the first period, which others might follow in subsequent periods. The scheme works like this: once a supra-competitive equilibrium which is most likely derived from coordination is detected, the regulator can mandate one of the suppliers involved to freeze its price at the supra-competitive level. While the supplier is not limited to the quantity he may sell, the price, quality, level of service, and terms of sale, cannot be changed. The other suppliers will be free to price as they deem fit. Assuming the frozen price is above their costs, their algorithms may quickly learn that they can boost their profits by reducing their price to capture the capacity of the price-frozen firm, especially if the pricing algorithm they use is based on trial and error. The remedy can be repeated as needed, freezing the price of one supplier in each period. This, in turn, incentivizes any firm which might be subject to a price freeze to set its price at a lower level, either to ensure it retains its customers during the price freeze, or to avoid the freeze altogether ("anticipation effect"). To illustrate, assume an industry with five firms that coordinate prices on a supra-competitive level. Each has a 20% change that its price will be frozen. A firm's expected loss from price freeze, if it were to be chosen, amounts to $1,000,000 (due to lost sales). Thus, if it were risk-neutral, it would have an incentive to lower the price up to a level that would reduce its profits up to $200,000, in order to avoid a loss which is larger than its gain. This price incentive is further strengthened by a reputational effect that may result from such "naming and shaming." As a result, coordination could be broken, or at least should be achieved at lower pricing levels, with consumers benefiting in either case. Indeed, for price levels to be reduced, it might be sufficient that the anticipation effect lead only one firm to lower its price. In addition, should the price-frozen supplier engage in price discrimination (setting different prices for different consumers), the price freeze should relate to the highest price set. This, by itself, might limit

276. *Id.*

277. One limitation of this suggestion is that algorithms will quickly learn to take into account that once a price is reduced, it cannot quickly be raised. This might reduce their incentive to lower the price in the first place. DONINI, *supra* note 3, at 115.

incentives to engage in price discrimination. Observe that this solution can be applied to any part of the supply chain, from manufacturers to retailers.

The suggested remedy builds upon the fact that price-setting is by nature dynamic, with rivals' pricing decisions affected by one's own prices. It also takes advantage of the fact that coordination is inherently unstable, as each supplier has incentives to deviate from the coordinated price in order to increase his own profits at the expense of others. Indeed, it exploits, and flips on its head, the fact that the speed at which algorithms can detect price changes stabilizes oligopolistic coordination.[278] By doing so, it overcomes one of the main obstacles to such deviation in digital markets characterized by immediate detection of price deviations.

In temporal terms, the freeze should be sufficiently long to create incentives for firms to lower their price in order to avoid a price freeze. Relevant parameters include the volume and speed of transactions in the market, as well as the relative costs of other suppliers. However, the price freeze should not last so long as to make the price-frozen firm so unprofitable that it would have to exit the market. This is because in the long run, greater market concentration can harm consumer welfare.

To increase uncertainty, and therefore noise, the identity of the supplier who is mandated to freeze prices in each period, as well as the timing and the duration of the price freeze, should not be known ahead of time. Rather, the relevant supplier should be notified of its selection, and of the freeze's start and end dates, only close to such dates. To increase fairness, these parameters can be determined randomly by an algorithm which applies to all suppliers that meet certain criteria (such as having supply capacity beyond a minimal threshold). However, the algorithm may give weight to considerations that would increase the probability of success of the price freeze, such as the applying it to the firm which often raises prices before others or to a firm which most others tend to follow (both indicating a leader-follower pattern).

Of course, the price freeze solution is not bullet-proof. For it to work—i.e., for a price freeze on one to have significant effects on the pricing incentives of others—products must not be highly differentiated, and other suppliers must be able to supply the capacity of the price-frozen firm at lower prices. In addition, transactions must be relatively frequent and small, or the price freeze would need to be very long. Also, high barriers must exist for the price-frozen firm to switch to another market (wadgets rather than widgets). Furthermore, it requires other prices in the market to be relatively easily updated at the point of sale. Beyond these pragmatic considerations, since this remedy prohibits some firms from lowering their prices, it may (mistakenly)

278. Ezrachi & Stucke, *supra* note 226, at 3–4, 26; Gal, *supra* note 38, at 78–79; UK COMPETITION & MKTS. AUTH., *supra* note 20, ¶¶ 2.21, 5.

raise doubts as to its regulatory legitimacy. Public relations efforts, potentially drawing on the outcomes of previous price freezes, may be needed to deal with this concern. Another concern is that if pricing algorithms play a multi-period game, under some market circumstances they may find it profitable not to deviate. Finally, this remedy puts a high burden on the regulator and assumes substantial competence on his part to manage the technical needs and assess the right circumstances for intervention. However, the proposed remedy does not require an external regulator to set the price, but is based on the price voluntarily set by a supplier. Furthermore, as noted above, regulators can make use of algorithms to detect price response patterns in the market, to predict and analyze responses to a price freeze, and to determine the optimal length of the price freeze. Indeed, it is high time that we not rely only on human regulation in order to deal with algorithmic coordination. The use of such algorithms might potentially also reduce the risk of regulatory capture, which increases the more complex the regulatory scheme is. Finally, it is possible that in a repeated game the coordinating algorithms. Given these concerns, this solution is more of a thought exercise than a call for action.

Bishop suggested a variation, which is quite similar in spirit.[279] Under his proposal, once supra-competitive pricing is detected, the regulator would freeze a price bid by each oligopolist for a considerable period, one "long enough that any firm bidding prices substantially higher than the lowest bidder would suffer severe losses—and perhaps bankruptcy."[280] Charging a price would then become perilous. To put all firms in the same initial position, the regulator would require each firm to submit its future market price in a secret bid, and would then promulgate the results to take effect on a uniform starting date. Yet such a remedy would require ongoing monitoring of all prices in the market. Also, it would not allow any firm to reduce costs based on productive efficiencies realized during the price freeze (due, for example, to a new innovative production technique), and would not allow firms to react effectively to new market entrants.[281]

Sagi suggested another variation, where an oligopolist that significantly lowers its price would freeze its rivals' prices at their previously higher oligopoly level for a defined period of time ("low-price freeze").[282] As in the high-price freeze remedy suggested above, the anticipation of a low-price

279. William Bishop, *Oligopoly Pricing: A Proposal,* 28 ANTITRUST BULL. 311 (1983); *see also* Paolo Siciliani, *Tackling Algorithmic-facilitated Tacit Collusion in a Proportionate Way* 10 J. EUR. COMPETITION L. & PRACTICE 31 (2018) (suggesting that platform operators impose time restrictions on traders so that they could only change their prices at certain intervals, such as twice a day).

280. Bishop, *supra* note 279, at 315.

281. Gal, *supra* note 262, at 79–80.

282. Sagi, *supra* note 66, at 295–325.

freeze, by itself, might drive prices downward and create an incentive for oligopolists to set ex ante lower prices without the need for actual activation of the price freeze. Additionally, both remedies take advantage of prices set in the market by a firm, rather than requiring the regulator to determine them. Both have some relatively similar downsides. Yet one strong advantage of a low-price remedy is that it freezes the price at the lowest level offered, thereby benefiting the defector, and harming all colluders. As such, it also overcomes the problem of explaining a high price freeze and it gets directly to the low price. Another advantage is that it may overcome the limited capacity problem, given that all firms are now mandated to sell at the mandated low price, regardless of the capacity of the defector. At the same time, a low-price freeze is potentially more interventionary, in the sense that it directly sets the prices for all market participants, rather than for only one. But, more importantly, it might also strengthen concerns that it would lead to long-term inefficiency. One concern is that, if firms are not equally efficient, the defector would set the price at a level that is below the costs of (some of) its competitors.[283] The result might be that some firms would be driven out of the market. Once they do, prices can be returned to higher levels, with less competitors. Such a market structure is not necessarily conducive to welfare, especially if the competitors produce somewhat differentiated products or it changes market conditions so that oligopolistic coordination might be easier to sustain. Furthermore, as Sagi recognizes, the regulator would need to monitor, during the price freeze, all the trade conditions (including quality and non-price competition) of all the firms in the market, but the defector.[284] Moreover, a fixed long-term price of almost all market participants might lead to inefficiency in the face of changing market conditions.[285] Finally, if we assume a multiple period interaction in the market, the motivation to reduce the price also depends on how the potential price reducer expects its rivals to react towards it in a post-freeze world, given that its actions have triggered the regulatory response. Accordingly, the relative efficiency of both types of price freeze remedies depends on what weight should be given to their relative advantages and limitations under different settings.

VI. CONCLUSION

AI-powered pricing algorithms based on technologies like neural networks, deep learning, and reinforcement learning, provide data-driven solutions to cognitive tasks more quickly, and with more sophistication, than

283. For claims that prices can be predatory even if they are above-cost, see Edlin, *supra* note 35.

284. Sagi, *supra* note 66, at 300–01.

285. *Id.* at 300.

human decision-making. Once operated in the digital ecosystem, characterized by speedy communication, price transparency, and in many retail markets also high frequency of trading, such algorithms can change market dynamics and lead to a supra-competitive price equilibrium. They do so without any need for a prior agreement or direct communication. As such, they can be seen as part of what some call the "uncontract" environment, where contractual agreements are supplanted by technology and automatic procedures.[286] As a result, legal assumptions geared to deal with human behavior need to be reexamined. In particular, algorithmic coordination challenges assumptions about the ability of competitors to coordinate without an agreement.

In light of their strong comparative advantages, pricing algorithms are here to stay. Effective regulation is therefore needed to help guide the design, development, and use of such algorithms, in order to minimize their potential risks and maximize their potential benefits for society. Given that research on algorithmic pricing is still in its early stages, regulators should move cautiously. At the same time, it is essential to start thinking seriously about how to deal with algorithmic coordination.

Towards this end, this Article analyzed the current legal status of algorithmic coordination, as well as the main solutions proposed so far. As shown, a straightforward prohibition will not work. Other solutions, while thoughtful and interesting, have significant downsides. Some—like increased transparency—might even increase coordination. Others are highly costly, requiring regulators to maintain an intricate understanding of different types of algorithms in a myriad of market settings. Still others might create harms that exceed the benefits of the proposed regulation. Those solutions are also highly interventionary.

This Article explores four novel solutions, which build upon accumulated economic knowledge about coordinated pricing (e.g., the fact that a coordinated equilibrium is inherently unstable). Two solutions—algorithmic consumers and disruptive algorithms—use algorithms to counter other algorithms, and can be employed by the market as well as by a regulator. The other two solutions—price freezes and merger review—require direct governmental intervention. While three remedies—algorithmic consumers, merger regulation, and disruptive algorithms (operated by market participants)—are a call for action, the price freeze suggestion is more of a thought experiment. We hope this Article prompts more experimentation with the proposed solutions.

286. SHOSHANA ZUBOFF, THE AGE OF SURVEILLANCE CAPITALISM: THE FIGHT FOR A HUMAN FUTURE AT THE NEW FRONTIER OF POWER 218–21 (2019).

ARE YOU OUT OF YOUR MIND?: NEUROTECHNOLOGIES AND THE MAKING OF DISEMBODIED AGENCY

Daniel Levin[†]

> "Human beings are always already immersed in the world, in producing what it means to be human in relationships with each other and with objects . . . . If you start talking to people about how they cook their dinner or what kind of language they use to describe trouble in a marriage, you're very likely to get notions of tape loops, communication breakdown, noise and signal."
>
> —Donna Haraway[1]
>
> "We do not contemplate ourselves, but we exist only in contemplating—that is to say, in contracting that from which we come."
>
> —Gilles Deleuze[2]

ABSTRACT

This Paper expounds on the legal and philosophical implications underlying the development of brain-computer interfaces (BCIs). As it stands, the current U.S. legal regime is ill-equipped to redress emergent privacy harms in these BCI developments. By privileging identifiability through discrete data points and limited interpersonal contexts, these laws misapprehend how companies facilitate classification and identification through the construction of behavioral profiles constituted through psychographics and the combination of various data points with other contextual data. Privacy law's failure to appreciate the social

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1. Hari Kunzru, *You Are Cyborg*, WIRED (Feb. 1, 1997), https://www.wired.com/1997/02/ffharaway/.

2. GILLES DELEUZE, DIFFERENCE AND REPETITION 74 (Paul Patton trans., Columbia Univ. Press 1994).

construction of doing privacy is by no means a sheer coincidence. Rather, it traces a genealogy to its normative underpinnings, wherein tech companies have "habituated us into thinking that managing our privacy is an individual responsibility."[3] In turn, our legal infrastructure entrenches a longstanding fallacy where privacy means control.

This Note considers these issues in four parts. Part II provides an overview of how BCIs developed through medical and scientific research, generating the preconditions for illicit use in employment, military, education, and consumer product contexts. Part III draws out the implications for neural data extraction and manipulation, focusing attention towards neuroethical and privacy considerations for emerging disembodied agency.[4] Part IV surveys deficiencies in existing privacy legal infrastructures for protecting neural data and, specifically, interrogates the underlying tenets to doing privacy law. Part V proposes a regulatory framework for protecting neural data that incorporates ongoing multi-stakeholder engagement to ensure that privacy law keeps pace with BCI's rapid innovation.

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I. INTRODUCTION

Over the past decade, technology companies have sought advancements in neurotechnology—especially in brain-computer interfaces (BCIs)—to perform behavioral analytics at more granular and exacting levels. Using electrical neural data, these systems decode responses to external stimuli and, in some instances, translate thought into rudimentary speech or muscle movements. While these uses are integral to enabling autonomy for disabled persons, their expanding use in workplace and consumer settings risk

3. Ari Ezra Waldman, *Privacy, Practice, and Performance*, 110 CALIF. L. REV. 1221, 1227 (2022).

4. This Note uses the term "disembodied agency" to refer to the ability to act without using the body to mediate such action. Whereas an agent typically "thinks before acting," BCIs risk converging the space between thought and action, producing agents that think and act simultaneously, and render thought itself into action.

undermining the distance users need to process stimuli beyond mere intuitions and to narrate their responses to such stimuli. At the same time, the privacy risks endemic to these technologies remain constant among their users, with more disproportionate effects burdening disabled communities.

Such recent advances in neurotechnology risk displacing users' sense of personhood. With the advent of BCIs—or, the use of machine learning technologies to decode neural data and elicit speech or motor responses—the gap between human and machine shrinks. As these technologies integrate the brain with external devices, balancing their medical benefits with their ethical and privacy implications becomes increasingly complex., BCIs assimilate neurodivergent persons into "normalcy," eroding their privacy to "think for themselves."[5] This highlights an underlying tenet to privacy scholarship: privacy enables the precondition for thinking, such that meaningful expression becomes possible. Neil Richards popularized this phenomenon as "intellectual privacy," arguing that "[t]he ability to freely make up our minds and to develop new ideas . . . depends upon a substantial measure of intellectual privacy."[6]

Indeed, just as privacy provides the precondition for thinking, thinking provides the precondition for being. Making sense of our interactions requires the space to reflect on the transition from intention and emotion to expression. While useful in limited medical and rehabilitative contexts—such as enabling para- and tetraplegic persons to elicit muscle movements[7] or think language into external speech[8]—the expansion of BCI-enabled capacities could erode this reflection process. Nevertheless, we should be wary of technologists' half-

5. Eran Klein, Sara Goering, Josh Gagne, Conor V. Shea, Rachel Franklin, Samuel Zorowitz, Darin D. Dougherty & Alik S. Widge, *Brain-Computer Interface-Based Control of Closed-Loop Brain Stimulation: Attitudes and Ethical Considerations*, 3 BRAIN-COMPUT. INTERFACES 140, 140 (2016).

6. Neil M. Richards, *Intellectual Privacy*, 87 TEX. L. REV. 387, 389 (2008).

7. *See, e.g.*, Samuel C. Colachis IV, Marcie A. Bockbrader, Mingming Zhang, David A. Friedenberg, Nicholas V. Annetta, Michael A. Schwemmer, Nicholas D. Skomrock, Walter J. Mysiw, Ali R. Rezai, Herbert S. Bresler & Gaurav Sharma, *Dexterous Control of Seven Functional Hand Movements Using Cortically-Controlled Transcutaneous Muscle Stimulation in a Person With Tetraplegia*, 12 FRONTIERS NEUROSCI. 1, 1 (Apr. 4, 2018), https://doi.org/10.3389/fnins.2018.00208.

8. *See, e.g.*, Robin Marks, *"Neuroprosthesis" Restores Words to Man with Paralysis*, U. CAL. S.F. (July 14, 2021), https://www.ucsf.edu/news/2021/07/420946/neuroprosthesis-restores-words-man-paralysis.

truths, mischaracterizing BCIs' "mind-reading"[9] or "skill-uploading"[10] capacities. But sobering ourselves to the current state of the technology should not dissuade us from considering whether to reorient its development.

As it stands, the current U.S. legal regime is ill-equipped to redress emergent privacy harms in these BCI developments. By privileging identifiability through discrete data points and limited interpersonal contexts, these laws misapprehend how companies facilitate classification and identification through the construction of behavioral profiles constituted through psychographics and the combination of various data points with other contextual data. Privacy law's failure to appreciate the social construction of doing privacy is by no means a sheer coincidence. Rather, it traces a genealogy to its normative underpinnings, wherein tech companies have "habituated us into thinking that managing our privacy is an individual responsibility."[11] In turn, our legal infrastructure entrenches a longstanding fallacy where privacy means control.

This Note considers these issues in four parts. Part II provides an overview of how BCIs developed through medical and scientific research, generating the preconditions for illicit use in employment, military, education, and consumer product contexts. Part III draws out the implications for neural data extraction and manipulation, focusing attention towards neuroethical and privacy considerations for emerging disembodied agency.[12] Part IV surveys deficiencies in existing privacy legal infrastructures for protecting neural data and, specifically, interrogates the underlying tenets to doing privacy law. Part V proposes a regulatory framework for protecting neural data that incorporates ongoing multi-stakeholder engagement to ensure that privacy law keeps pace with BCI's rapid innovation.

II. WHAT ARE BCIS?

Any attention to privacy and ethical concerns endemic to technologies must first grapple with how the technology works. As a preliminary matter,

9. Josh Constine, *Facebook is Building Brain-Computer Interfaces for Typing and Skin-hearing*, TECHCRUNCH (Apr. 19, 2017), https://techcrunch.com/2017/04/19/facebook-brain-interface/.

10. Daniel Kolitz, *Will It Be Possible to Upload Information to My Brain?*, GIZMODO (Sept. 20, 2021), https://gizmodo.com/will-it-be-possible-to-upload-information-to-my-brain-1847698784.

11. Waldman, *supra* note 3, at 1227.

12. This Note uses the term "disembodied agency" to refer to the ability to act without using the body to mediate such action. Whereas an agent typically "thinks before acting," BCIs risk converging the space between thought and action, producing agents that think and act simultaneously, and render thought itself into action.

this Part seeks to categorize BCIs' primary types and user inputs, providing examples when applicable of how these devices extract, transform, and respond to user information. This Part also details a brief overview of BCI development and provides various use cases to demonstrate its growing traction beyond traditional medical rehabilitation.

A. CATEGORIZING BCI TYPES AND USER INPUTS

Today's BCIs fall broadly into one of two types: invasive or non-invasive. As the name suggests, invasive BCIs refer to implants installed directly into or on top of the user's brain. Such devices require surgical procedure to install the device. Typically, these BCIs only appear in medical contexts. The second type—non-invasive BCIs—use external electrodes or other sensors connected to the body for collecting and modulating neural signals. Whereas the former appears mostly in medical contexts, the latter holds more traction among both medical and consumer products, typically appearing as wearable headbands and wristbands.

While researchers tend to divide BCIs into these two types, it bears mentioning that the term "non-invasive" serves as a misnomer. To the extent that these devices may still register neural data and stimulate users accordingly, they produce similar effects to their "invasive" counterparts, namely modulating neural activity. For example, transcranial direct current stimulation (TDCS) direct electrical currents to specific parts of the brain to enhance users' memory retention and learning capabilities.[13] Additionally, electromyography (EMG) sensors attach to users' wrists and may record motor neurons and muscular electrical activity.[14] Currently, these devices aid in diagnosing neuromuscular abnormalities, though researchers have garnered interest in integrating EMG to detect users' intent to move their fingers for operating virtual keyboards and external devices.[15] By reducing the calculus to BCIs' surgical component, researchers developed an arbitrary division between "invasive" and "non-invasive" BCIs, which mischaracterizes the technology's fundamental nature in modulating neural activity.

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13. *See* Nicola Riccardo Polizzotto, Nithya Ramakrishnan & Raymond Y. Cho, *Is It Possible to Improve Working Memory with Prefrontal tDCS? Bridging Currents to Working Memory Models*, 11 FRONTIERS PSYCH. 1, 1 (2020), https://www.frontiersin.org/articles/10.3389/fpsyg.2020.00939/full.

14. *See* Adi Robertson, *I Tried the Wristband that Lets You Control Computers with Your Brain*, VERGE (Jun. 6, 2018), https://www.theverge.com/2018/6/6/17433516/ctrl-labs-brain-computer-interface-armband-hands-on-preview.

15. Reality Lab, *Inside Facebook Reality Labs: The Next Era of Human-Computer Interaction*, FACEBOOK (Mar. 8, 2021), https://tech.facebook.com/reality-labs/2021/3/inside-facebook-reality-labs-the-next-era-of-human-computer-interaction/.

Once researchers develop either an invasive or non-invasive device, they distinguish user inputs through two primary categories. First, with active BCIs, users intentionally perform mental tasks that produce designated patterns of brain activity.[16] Typically, this involves capturing neural signals that imagine moving the body or eliciting some act. These signals derive from motor cortical areas of the brain, such that we can activate movements merely through *intending* such movements.[17] As this Note discusses below, closing the gap between intention and action may incur dire consequences for users' ability to exercise agency and autonomy, disabling the necessary space to think before acting. While these effects are generalizable, these technologies disproportionately displace these harms onto disabled users, who lack sufficient recourse to opt out. Indeed, to the extent that such technologies mediate action through intention, they also turn intentions *into* actions.

Second—in opposition to active BCIs—passive BCIs monitor brain activity to detect patterns.[18] These have been integral to generating affective computing systems that recognize lapses in emotional state and attention, such that employers can predict and preempt dangerous workplace situations.[19] For example, these passive BCIs may detect "unintentional changes in a user's cognitive state as an input for other adaptive systems," such that detection of a driver's drowsiness may prompt their vehicle to either change the temperature or the volume of the sound system to increase the driver's alertness.[20] They also show promise in predicting cognitive and affective states for modulating (and sometimes improving) user-adaptive interaction.[21] For

16. *See* Steffen Steinert, Christoph Bublitz, Ralf Jox & Orsolya Friedrich, *Doing Things with Thoughts: Brain-Computer Interfaces and Disembodied Agency*, 32 PHIL. & TECH. 457, 460 (2018).

17. For a few examples of these BCIs, see generally Ritik Looned, Jacob Webb, Zheng Gang Xiao & Carlo Menon, *Assisting Drinking With an Affordable BCI-Controlled Wearable Robot and Electrical Stimulation: A Preliminary Investigation*, 11 J. NEUROENG'G & REHAB. 51 (2014) (commanding neuroprosthetic arm to drink); Ferran Galán Marnix Nuttin, Eileen Lew, Pierre W. Ferrez, Gerolf Vanacker, Johan Philips & J. del R. Millán, *A Brain-Actuated Wheelchair: Asynchronous and Non-invasive Brain–Computer Interfaces for Continuous Control of Robots*, 119 CLINICAL NEUROPHYSIOLOGY 1 (2008) (using neural data to drive wheelchair); Serafeim Perdikis, Robert Leeb, John Williamson, Amy Ramsay, Michele Tavella, Lorenzo Desideri, Evert-Jan Hoogerwerf, Abdul Al-Khodairy, Roderick Murray-Smith & J. d R Millán, *Clinical Evaluation of BrainTree, A Motor Imagery Hybrid BCI Speller*, 11 J. NEURAL ENG'G 1 (2014) (controlling a spelling application).

18. *See* Steinert et al., *supra* note 16, at 461.

19. *See* Thorsten O. Zander & Christian Kothe, *Towards Passive Brain–Computer Interfaces: Applying Brain–Computer Interface Technology to Human–Machine Systems in General*, 8 J. NEURAL ENG'G 1, 2–4 (2011).

20. Maryam Alimardani & Kazuo Hiraki, *Passive Brain-Computer Interfaces for Enhanced Human-Robot Interaction*, 7 FRONTIERS ROBOTICS & AI 1, 2 (2020).

21. *See id.* at 1.

example, when users interface in gaming environments through BCIs, they may experience frustration or boredom, signaling that the game should either decrease its level of difficulty or, alternatively, introduce additional elements for engagement.[22]

B. EXPANDING APPLICATIONS FOR BCIS

At first relegated to rehabilitation, BCIs were integrated into medical environments to assist patients with debilitating illnesses. For example, patients with essential tremors and Parkinson's disease used BCIs to identify and stimulate curative brain activities.[23] Those with locked-in syndrome could elicit muscular movements and engage in rudimentary speech.[24] Recent advancements have converted paralyzed persons' thoughts into texts[25] and generated artificial vision for the blind.[26]

While the technology remains nascent, recent developments demonstrate its growing traction beyond medical use. In Barcelona, the Synthetic, Perceptive, Emotive and Cognitive Systems (SPECS) Group at the Institute for Bioengineering of Catalonia used an active BCI to conduct an orchestral performance through brain waves and heart rate alone.[27] Performers shifted their attention between varying visual frequencies, enunciating an emotional experience devoid of any bodily expression.[28] Other researchers demonstrated

22. *See* Christian Mühl, Brendan Allison, Anton Nijholt & Guillaume Chanel, *A Survey of Affective Brain Computer Interfaces: Principles, State-of-the-Art, and Challenges*, 1 BRAIN-COMPUT. INTERFACES 66, 68 (2014).

23. *Deep Brain Stimulation (DBS) for the Treatment of Parkinson's Disease and Other Movement Disorders*, NAT'L INST. NEUROLOGICAL DISORDERS & STROKE, https://web.archive.org/web/20220110115505/https://www.ninds.nih.gov/About-NINDS/Impact/NINDS-Contributions-Approved-Therapies/DBS.

24. Daniel Engber, *The Neurologist Who Hacked His Brain—And Almost Lost His Mind*, WIRED (Jan. 26, 2016), https://www.wired.com/2016/01/phil-kennedy-mind-control-computer/.

25. Peter Dockrill, *Brain Implant Translates Paralyzed Man's Thoughts Into Text With 94% Accuracy*, SCI. ALERT (Nov. 8, 2021), https://www.sciencealert.com/brain-implant-enables-paralyzed-man-to-communicate-thoughts-via-imaginary-handwriting.

26. Carly Cassella, *Brain Implant Gives Blind Woman Artificial Vision in Scientific First*, SCI. ALERT (Oct. 27, 2021), https://www.sciencealert.com/a-brain-implant-has-allowed-a-blind-woman-to-see-simple-2d-shapes-and-letters.

27. Jason Palmer, *World Premiere of Brain Orchestra*, BBC NEWS (Apr. 24, 2009), http://news.bbc.co.uk/2/hi/science/nature/8016869.stm.

28. *Id.*

success in manipulating external objects, including control of drone flight,[29] mobile devices,[30] and computer games.[31]

Yet these emerging uses stray from the technology's origins. Paralleling developments for medical use, researchers have sought to refine existing non-medical uses across various applications. Over the last decade alone, researchers have applied BCIs to lie detection,[32] detecting drowsiness for human work performance,[33] estimating reaction times,[34] and controlling virtual reality environments.[35]

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29. Karl LaFleur, Kaitlin Cassady, Alexander Doud, Kaleb Shades, Eitan Rogin & Bin He, *Quadcopter Control in Three-Dimensional Space Using a Noninvasive Motor Imagery-based Brain–Computer Interface*, 10 J. NEURAL ENG'G 1, 3 (2013).

30. Susan Young Rojahn, *Samsung Demos a Tablet Controlled by Your Brain*, MIT TECH. REV. (Apr. 19, 2013), https://www.technologyreview.com/2013/04/19/253309/samsung-demos-a-tablet-controlled-by-your-brain/.

31. Minkyu Ahn, Mijin Lee, Jinyoung Choi & Sung Chan Jun, *A Review of Brain-Computer Interface Games and an Opinion Survey from Researchers, Developers and Users*, 14 SENSORS 14601, 14613 (2014).

32. Lawrence A. Farwell, Drew C. Richardson, Graham M. Richardson & John J. Furedy, *Brain Fingerprinting Classification Concealed Information Test Detects US Navy Military Medical Information with P300*, 8 FRONTIERS NEUROSCI. 1, 1 (2014).

33. *See* Pietro Aricò, Gianluca Borghini, Gianluca Di Flumeri, Alfredo Colosimo, Stefano Bonelli, Alessia Golfetti, Simone Pozzi, Jean-Paul Imbert, Géraud Granger, Raïlane Benhacene & Fabio Babiloni, *Adaptive Automation Triggered by EEG-Based Mental Workload Index: A Passive Brain-Computer Interface Application in Realistic Air Traffic Control Environment*, 10 FRONTIERS HUM. NEUROSCI. 1, 3 (2016); Chun-Shu Wei, Yu-Te Wang, Chin-Teng Lin & Tzyy-Ping Jung, *Toward Drowsiness Detection Using Non-hair-Bearing EEG-Based Brain-Computer Interfaces*, 26 IEEE TRANSACTIONS ON NEURAL SYS. & REHAB. ENG'G 400, 400 (2018)*; see also* Stephen Chen, *'Forget the Facebook Leak': China is mining data directly from workers' brains on an industrial scale*, S. CHINA MORNING POST (Apr. 29, 2018), https://www.scmp.com/news/china/society/article/2143899/forget-facebook-leak-china-mining-data-directly-workers-brains. *See generally* Xiaoliang Zhang, Jiali Li, Yugang Liu, Zutao Zhang, Zhuojun Wang, Dianyuan Luo, Xiang Zhou, Miankuan Zhu, Waleed Salman, Guangdi Hu & Chunbai Wang, *Design of a Fatigue Detection System for High-Speed Trains Based on Driver Vigilance Using a Wireless Wearable EEG*, 17 SENSORS 486 (2017) (describing a novel fatigue detection system for high-speed train safety based on monitoring train driver vigilance using a wireless wearable EEG).

34. *See generally* Dongrui Wu, Brent J. Lance, Vernon J. Lawhern, Stephen Gordon, Tzyy-Ping Jung & Chin-Teng Lin, *EEG-Based User Reaction Time Estimation Using Riemannian Geometry Features*, 25 IEEE TRANSACTIONS ON NEURAL SYS. & REHAB. ENG'G 2157 (2017) (validating the performance of a new proposed approach for EEG-based BCI regression problems in reaction time estimation from EEG signals measured in a large-scale sustained-attention psychomotor vigilance task).

35. *See generally* Athanasios Vourvopoulos, Octavio Marin Pardo, Stéphanie Lefebvre, Meghan Neureither, David Saldana, Esther Jahng & Sook-Lei Liew, *Effects of a Brain-Computer Interface With Virtual Reality (VR) Neurofeedback: A Pilot Study in Chronic Stroke Patients*, 13 FRONTIERS HUM. NEUROSCI. 1 (2019) (combining the principles of VR and BCI in a REINVENT platform to assess its effects on four chronic stroke patients across different levels of motor impairment).

Today, as the race ensues to build out an embodied internet through the "metaverse," companies hedge their bets on integrating BCI technologies—typically electroencephalogram (EEG) wearables—into immersive environments.[36] For example, in 2019, Meta acquired CTRL-Labs, a startup developing wristbands that use muscular electrical activity to control external devices.[37] Similarly, in 2022, Snap acquired NextMind, a startup developing headbands to perform comparable functions.[38] Both Meta and Snap expressed interest in deploying these devices in virtual and augmented reality settings.[39] With a growing enthusiasm for expanding BCI applications, researchers and developers are working to broaden human experiences through these settings, including the capacity to experience not only one's own feelings and sensations in these immersive environments, but also other users'.[40] All the while, there remain significant limitations in examining the privacy and ethical concerns in both the development and deployment of BCIs.

III. PRIVACY AND ETHICAL CONSIDERATIONS FOR DISEMBODIED AGENCY

Because BCIs' intended uses are heterogeneous, these technologies risk reproducing asymmetries in users' human experience. On one hand, those with disabilities require these advancements to assimilate into able-bodied society. On the other hand, those without disabilities may avail themselves of human experiences that transcend having a body. As this Note suggests, the privacy and ethical concerns endemic to both sets of users are the same: the technology displaces the body into a sequence of automatisms, reconfiguring how we understand an emerging disembodied agency that undermines the integrity of thought.

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36. *See* Amir Reza Asadi, *BCI for Metaverse*, METAVERSE CHI (Mar. 24, 2022), https://metaverse.acm.org/bci-for-interaction-with-metaverse/; Sissi Cao, *Mark Zuckerberg Teases AI 'Brain Chip'—But It Will Be Different than Elon Musk's*, OBSERVER (Oct. 12, 2019), https://observer.com/2019/10/mark-zuckerberg-ai-brain-chip-elon-musk-neuralink/.

37. Nick Statt, *Facebook Acquires Neural Interface Startup CTRL-Labs for its Mind-Reading Wristband*, VERGE (Sept. 23, 2019), https://www.theverge.com/2019/9/23/20881032/facebook-ctrl-labs-acquisition-neural-interface-armband-ar-vr-deal.

38. Sissi Cao, *Snap's Latest Acquisition is a Bet on a Metaverse Controlled by Thoughts*, OBSERVER (Mar. 24, 2022), https://observer.com/2022/03/snap-acquire-nextmind-brain-computer-interface-metaverse/.

39. *Id.*; Cao, *supra* note 36.

40. Sergio López Bernal, Mario Quiles Pérez, Enrique Tomás Martínez Beltrán, Gregorio Martínez Pérez & Alberto Huertas Celdrán, *When Brain-Computer Interfaces Meet the Metaverse: Landscape, Demonstrator, Trends, Challenges, and Concerns*, ARXIV (Dec. 6, 2022), https://arxiv.org/pdf/2212.03169.pdf.

This Part details three chief privacy concerns, each building on each other. First, trends in BCI development intrude on data subjects' autonomy over their emotions and subject them to greater vulnerability to emotional manipulation.[41] Specifically, BCI development refines existing means for interpreting data subjects' affective states, registering emotion-related responses to external stimuli as a means for contextualizing and modulating users' disposition towards such stimuli.[42] Second, BCIs exacerbate general issues with machine learning technologies, wherein statistical inferences may potentially misidentify and entrench users' affective states. Third, by registering users' response to stimuli and modulating their neural activity accordingly, BCIs enter a feedback loop that divorces users from the deliberative process to reflect on their own thoughts and instantiate some act upon their own volition.

As later-discussed developments in BCIs indicate, the technology trends towards intruding on data subjects' autonomy over their emotions. Specifically, BCI development traces a genealogy of using technology to interpret and modulate data subjects' affective states. With the current state of neural imaging, discrete neural data points have little capacity to identify their users, let alone any particular ailments they suffer.[43] But such identifications—or differentiations, as the literature describes—have proven possible through the collection of 30-second recordings of brain activity.[44] Through neural fingerprinting, BCIs generate inferences about individual biology and cognitive states, rendering information about users' moods, intentions, and physiological characteristics.[45] These reverse inferences register patterns of brain activity to approximate specific cognitive states.[46] Thus, while they do not decode thoughts—as in, translate granular accounts of neural patterns into specific cognitive processes—they provide an exacting mechanism for processing perceptions to stimuli and subjecting them to manipulation.

41. *See generally* Steffen Steinert & Orsolya Friedrich, *Wired Emotions: Ethical Issues of Affective Brain-Computer Interfaces*, 26 SCI. & ENG'G ETHICS 351 (2020) (providing an overview of ethical issues with BCIs that allow for the detection and stimulation of affective states).

42. *Id.* at 352.

43. Jeremy Greenberg, Katelyn Ringrose, Sara Berger, Jamie VanDodick, Francesca Rossi & Joshua New, *Privacy and the Connected Mind*, FUTURE PRIV. F. (Nov. 2021), https://fpf.org/wp-content/uploads/2021/11/FPF-BCI-Report-Final.pdf.

44. Jason da Silva Castanheira, Hector Domingo Orozco Perez, Bratislav Misic & Sylvain Baillet, *Brief Segments of Neurophysiological Activity Enable Individual Differentiation*, 12 NATURE COMMC'NS. 1, 2 (2021).

45. Greenberg et al., *supra* note 43, at 9.

46. Russell A. Poldrack, *Inferring Mental States from Neuroimaging Data: From Reverse Inference to Large-Scale Decoding*, 72 NEURON 692, 697 (2011).

Just as BCI developments may be situated within a broader trajectory to interpret and modulate data subjects' affective states, they suffer from the same limitations of other machine learning technologies. Using predictive algorithms, these data analyses provide more than passive determinations; they provoke certain responses that divorce users from contexts that otherwise elicit human decisional conflicts in the first place. Put differently, efforts to refine behavioral analytics result in pitching contexts that ensure specific behavioral responses, with increasing precision relative to the granularity of data collected.

For example, BCIs may deduce erroneous patterns in behavior and, in turn, register such deductions for predictive purposes. To illustrate this, an individual operating a neuroprosthetic—such as a BCI-controlled wheelchair or arm—may experience hunger and intend movement towards a particular food item in sight. While the event occurred through a confluence of circumstances, the BCI would register extraneous information that may otherwise prove irrelevant, such as when and where the user experienced hunger and what item induced such feelings or intentions. Devoid of context, these neural patterns train the device to ascertain specific preferences. Consequently, BCIs may usurp users' decision-making capacity to the extent that they have registered historical data about users' past decisions as proxies for their future decisions. For example, a user may operate a BCI-controlled wheelchair that not only deduces that the user is thinking about food, but also registers inferences about the user's biology and preferences around whether a user is hungry and the times.[47] To this extent, these devices may limit the possibility for users to meaningfully exercise autonomy over future decisions and make significant departures from such past decisions. This problem recapitulates what Kate Crawford critiqued of machine learning technologies generally, namely that "machine learning exploits what it does know to predict what it does not know: a game of repeated approximations."[48]

Beyond these deductions, BCIs may relate neural data to other contextual indicia, drawing disparate statistical inferences on otherwise irrelevant data points. Assumed to magnify the context, BCIs may integrate neural data with voice recordings, smartphone, social media usage data, and geolocation to signify greater meaning to neural activity.[49] The practice of relating these data

47. Greenberg et al., *supra* note 43, at 13.

48. KATE CRAWFORD, THE ATLAS OF AI: POWER, POLITICS, AND THE PLANETARY COSTS OF ARTIFICIAL INTELLIGENCE 221 (2021).

49. Marcello Ienca, Joseph J. Fins, Ralf J. Jox, Fabrice Jotterand, Silja Voeneky, Roberto Andorno, Tonio Ball, Claude Castelluccia, Ricardo Chavarriaga, Hervé Chneiweiss, Agata Ferretti, Orsolya Friedrich, Samia Hurst, Grischa Merkel, Fruzsina Molnár-Gábor, Jean-Marc

points to identify users' interests corresponds to what Brittan Heller has termed "biometric psychography."[50]

Under this calculus, biometric psychography positions behavioral and anatomical information—such as pupil dilation—to measure users' reactions to stimuli over time.[51] As Heller wrote, this can reveal not only users' physical, mental, and emotional states, but also the stimuli causing the user to enter that state.[52] Rather than using that data to achieve identification, these technologies produce broader inferences about users' values and attitudes, and can incorporate such inferences into more refined neuromarketing schemes.[53]

By situating BCIs within a broader trajectory to interpret data subjects, stakeholders can understand how privacy over neural data provides the prerequisite for self-realization and community-building. Mental privacy enables us to regulate the interpersonal and spatial interactions that constitute identity.[54] Disrupting that cognitive control affects the very process for identity-formation and ruptures the distance to engage in self-reflection. With BCIs, the distance that mediates such regulation closes, coercing users to engage in suppressing thoughts that may otherwise be integral to informing their values and, eventually, their actions.

Relying on historical data to render future decisions, BCIs enter a feedback loop that divorces users from deliberating and thinking before acting, limiting the scope of potential actions that may otherwise result from that deliberative process. Put otherwise, as intention itself *becomes* action, the ability to exercise executory control shrinks, thereby preempting the ability to think about our thoughts without automatically instantiating them. Rather than acting upon volition, BCI technologies encourage users to increasingly act without a conscious apprehension of a given moment, sublimating action into a sequence of instincts. Picking up on the underlying signal, BCIs translate thoughts into movements and render meaning to such thoughts that, in turn, inform further action. These actions devolve into automatisms, reflexively habituating thought into intuitions.

Rickli, James Scheibner, Effy Vayena, Rafael Yuste & Philipp Kellmeyer, *Towards a Governance Framework for Brain Data*, 15 NEUROETHICS 1, 3 (2022).

50. Brittan Heller, *Watching Androids Dream of Electric Sheep: Immersive Technology, Biometric Psychography, and the Law*, 23 VAND. J. ENT. & TECH. L. 1, 27 (2021).

51. *Id.*

52. *Id.*

53. Marcello Ienca, Pim Haselager & Ezekiel J. Emanuel, *Brain Leaks and Consumer Neurotechnology*, 36 NATURE BIOTECH. 805, 805–10 (2018).

54. Abel Wajnerman Paz, *Is Mental Privacy a Component of Personal Identity?*, 15 FRONTIERS HUM. NEUROSCI. (Oct. 2021); *see also* Julie Cohen, *What Privacy Is For*, 126 HARV. L. REV. 1904, 1905 (2013).

Such inferential power facilitates more exacting disclosures of mental information.[55] Because BCIs retain the capacity to read and modulate brain activity, they pose a significant threat to manipulative stimulation at unprecedented scale. Additionally, these technologies enable covert forms of discrimination predicated on neural signatures, including mental health, personality traits, cognitive performance, intentions, and emotional states.[56] Such signatures are fed into automated systems that could draw statistical inferences about group character and behavior, presupposing some inherence in responses to stimuli or a predisposition to certain cognitive processes.[57] For example, processing neural data may indicate a predisposition to dementia or prodromal cognitive decline, which could result in data controllers' access to (and potential disclosure of) sensitive information about these users.[58]

Research has demonstrated such interest in deploying machine learning techniques to read brain states and predict users' movement intentions, bypassing the deliberative process for users to provide commands.[59] But neural data does little to explain users' inner machinations, let alone the historical forces that habituate and inform such deliberative processes. Indeed, they divorce users from reflection, potentiating a host of vulnerabilities that may include embarrassing disclosures—including about one's sexuality or gender—or outright violent acts.

Yet the current research seldom addresses and has undertheorized these privacy concerns. By focusing predominantly on the technology's intended uses and effects, the overwhelming bulk of scientific literature, in particular, escapes meaningful discourse on BCIs' privacy and ethical harms. As developers trend towards privacy and accessibility by design, these contributions will prove critical to producing more equitable technologies in use and kind.

Privacy scholarship on BCIs has begun to fill in these gaps, though it remains sparse. Among the scholarship, authors have challenged how neural

55. Ienca et al., *supra* note 49, at 5.

56. *Id.* at 7.

57. *Id.* at 8. These practices risk reproducing now-defunct racist pseudo-sciences—such as physiognomy and phrenology—which conform certain external manifestations of expression into legible mental faculties. Though beyond the scope of this Note, I argue that the process of translating neural signals into neural data generates a similar external manifestation that renders analyses devoid of context. *See generally* Luke Stark & Jevan Hutson, *Physiognomic Artificial Intelligence*, 32 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 922 (2022) (discussing reanimation of pseudosciences in emerging technologies).

58. Ienca et al., *supra* note 49, at 7, 9.

59. Yijun Wang & Tzyy-Ping Jung, *A Collaborative Brain-Computer Interface for Improving Human Performance*, 6 PLOS ONE 1, 1 (2011), https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0020422.

engineering poses new concerns to the Fifth Amendment's self-incrimination doctrine, blurring the traditional distinction between testimonial and physical evidence.[60] Others have identified the technical and security vulnerabilities that such devices have, rendering BCIs susceptible to adversarial attacks and leaving users at risk of mental and physical manipulation.[61] In these instances, "brain malware" may extract users' neural data by either "hijacking the legitimate components of a BCI system" or "adding or replacing the legitimate BCI components."[62] These contributions have been integral to informing the theoretical backdrop for BCIs, though the works seldom consider how BCIs' data practices incur privacy harms, let alone how they interact with privacy law.

IV. STRUCTURAL FAILURES IN AND OF PRIVACY LAW

In light of their ability to convert intentions into actions, BCIs threaten core foundations that constitute personhood. By reducing thought into quantifiable metrics, the technology removes thought from the province of our minds, thereby limiting the possibility to engage in alternative actions beyond the device's registered data. Moreover, they contribute to a growing political economy that adheres to an "extraction imperative," borne out of profit-driven motivations to predict something "essential" to our person.[63]

Indeed, for those made reliant on the technology—especially those among disabled communities—these risks imperil users' ability to narrate and realize themselves on their terms. In light of these risks, privacy law offers little recourse for protecting neural data from companies' encroachment. Existing law entrenches a banal view of *doing* privacy, reducing it to procedural checklists like performing diligence and conducting impact assessments. In turn, privacy professionals further a culture that serves corporate interests under the guise of advancing privacy, performing tasks given to them within a constraining organization.[64] As this Part lays out, privacy law therefore suffers from structural deficiencies, many of which are irremediable without overhauling predominating discourses around *doing* privacy.

Accordingly, this Part details three key failures in federal and state privacy laws alike. First, sectoral privacy laws place too much emphasis on the types of relationships mediating information flows, rather than the information

60. Nita Farahany, *Incriminating Thoughts*, 64 STAN. L. REV. 351, 394–400 (2012).

61. Tamara Bonaci, Ryan Calo & Howard Jay Chizeck, *App Stores for the Brain: Privacy & Security in Brain-Computer Interfaces*, IEEE TECH. & SOC'Y MAG. 35–39 (June 2015).

62. *Id.* at 35.

63. SHOSHANA ZUBOFF, THE AGE OF SURVEILLANCE CAPITALISM: THE FIGHT FOR A HUMAN FUTURE AT THE NEW FRONTIER OF POWER 87 (2019).

64. Waldman, *supra* note 11, at 1268–69.

itself. Second, because privacy laws tend to follow consequentially to innovation, their definitions of phenomena are often too narrow in scope to capture new ways of understanding (and regulating) such phenomena, as exemplified in biometric privacy laws. Third, because companies rely on such narrow definitions to comply with existing law, they simultaneously inform how regulators and standard-setting organizations understand compliance themselves, in turn deferring to corporate norms to govern privacy.

In its current iteration, privacy law remains a fragmented regime that privileges disparate interests in information relative to particular relationships. For example, health privacy laws, like the Health Insurance Portability and Accountability Act (HIPAA), narrowly govern the doctor-patient relationship.[65] Because HIPAA was enacted prior to our burgeoning landscape of consumer medical technologies, these technologies evade scrutiny and enable corporate actors to operate outside of HIPAA's purview, all the while extracting the same information.[66] Companies' outlandish claims to "access and absorb knowledge instantly from the cloud or . . . pump images from one person's retina straight into the visual cortex of another"[67] run amok, enabled through a neoliberal legal apparatus that recapitulates what Julie Cohen termed the "surveillance-innovation complex."[68]

Additionally, privacy law reproduces limited understandings of phenomena, narrowly drafting definitions that should otherwise qualify as personal information. For example, biometric privacy laws privilege recognition through external physiological features.[69] Newer legislation has expanded understandings of biometrics to "behavioral characteristics," but then exemplifies biometric information through imagery of retinas,

65. *HIPAA: Covered Entities and Business Associates*, U.S. DEP'T HEALTH & HUM. SERVS., https://www.hhs.gov/hipaa/for-professionals/covered-entities/index.html (last visited Apr. 11, 2023).

66. *Concerns Raised About the Sharing of Health Data with Non-HIPAA Covered Entities via Apps and Consumer Devices*, HIPAA J. (Mar. 27, 2019), https://www.hipaajournal.com/concern-sharing-health-data-non-hipaa-covered-entities/.

67. *How Brains and Machines Can be Made to Work Together*, ECONOMIST (Jan. 4, 2018), https://www.economist.com/technology-quarterly/2018/01/04/how-brains-and-machines-can-be-made-to-work-together.

68. JULIE COHEN, BETWEEN TRUTH AND POWER: THE LEGAL CONSTRUCTIONS OF INFORMATIONAL CAPITALISM 89 (2019).

69. *See, e.g.*, 740 ILL. COMP. STAT. 14/10 (2008) ("'Biometric identifier' means a retina or iris scan, fingerprint, voiceprint, or scan of hand or face geometry.").

fingerprints, and facial geometries.[70] And, unless neural data alone can identify an individual, it evades legal definitions for personal information.[71]

Such biometric laws are not only deficient in defining "biometrics," but also in their scope of protection.[72] Currently, only Illinois,[73] Texas,[74] and Washington[75] have enacted specific biometric privacy laws, with Illinois serving as the only state among them to provide consumers with a private right of action. In California, the state's omnibus privacy statute only provides a private right of action where the biometric information was subject to an unauthorized exposure resulting from a business's failure to implement and maintain reasonable security procedures.[76]

As it stands, no single law—neither federal nor state—governs data practices relating to neural data. By consequence, companies escape liability and remain compliant to the extent that their innovations escape existing laws' structural deficiencies to adequately define and protect this information. Absent these substantive protections to guide the development and implementation of these technologies, companies could leverage neural data as a commodity to produce consumer neurotechnologies, e-learning, digital phenotyping, affective computing, psychographics, and neuromarketing.[77]

Indeed, these deficits in legal protection enable companies to engage in privacy intrusions with relative impunity. As Daniel Solove and Woodrow Hartzog argue, existing enforcement bodies—such as the Federal Trade Commission (FTC)—defer to corporate privacy norms.[78] Specifically, the

70. CAL. CIV. CODE § 1798.140(b) (2021).

71. *See, e.g.*, *California Consumer Privacy Act (CCPA)*, ATT'Y GEN. ROB BONTA, https://oag.ca.gov/privacy/ccpa ("Personal information is information that identifies, relates to, or could reasonably be linked with you or your household. For example, it could include your name, social security number, email address, records of products purchased, internet browsing history, geolocation data, fingerprints, and inferences from other personal information that could create a profile about your preferences and characteristics.").

72. While beyond the scope of this Note, it bears mentioning that Europe's General Data Protection Regulation suffers from similar limitations as U.S. biometric laws, as its definition for biometrics also privileges identification through facial and fingerprint scans. *See* Regulation 2016/679 of the European Parliament and of the Council of Apr. 27, 2016, on the Protection of Natural Persons with Regard to the Processing of Personal Data and on the Free Movement of Such Data, and Repealing Directive 95/46/EC (General Data Protection Regulation), art. 4, 2016 O.J. (L 119) 3.

73. 740 ILL. COMP. STAT. 14/1 (2008).

74. TEX. BUS. & COM. § 503.001 (West 2017).

75. WASH. REV. CODE § 19.375 (2017).

76. CAL. CIV. CODE § 1798.150(a)(1) (2021).

77. Ienca et al., *supra* note 49, at 2.

78. Daniel J. Solove & Woodrow Hartzog, *The FTC and the New Common Law of Privacy*, 114 COLUM. L. REV. 583, 598–99 (2011).

Commission's over-emphasis on transparency privileges companies' unilateral option to prescribe their data practices, with little recourse for consumers to meaningfully opt out without losing access to the companies' services.[79] Absent substantive protections, privacy law remains a self-governing regime that allays meaningful choice and enforces a regulative ideal that we can and do read consumer-facing privacy policies, evaluate the choices available to us, and make informed choices. Yet it seems like an overestimation to assume that reading and understanding how platforms collect our data will inure to any substantive policy overhauls.[80]

Given the current privacy landscape, the FTC—and even state attorneys general (AGs)—can only offer limited protections for consumer data privacy.[81] Their efforts largely operate within existing legal infrastructures captured by corporate interests in self-regulation. As Woodrow Hartzog noted, building privacy frameworks around concepts of transparency and informational self-determination impresses the idea that consumers exercise autonomy in their online interactions.[82] However, when platforms obscure or subvert the availability of choices,[83] neither state AGs nor the FTC can signal particular harms. Our existing notice-and-consent regime thereby turns informed consent into a platitude, allocating risk management to consumers whose choices are ill-defined and illusive.[84]

Inadequate legal infrastructures are part and parcel of the broader political economy that enables corporate actors to operate within the confines of the law.[85] As Ari Waldman argued, privacy law reaches its apex when judges, lawyers, and scholars defer to symbolic structures—appointing compliance

79. *Id.* at 599.

80. *See* Neil Richards & Woodrow Hartzog, *The Pathologies of Digital Consent*, 96 WASH. U. L. REV. 1461, 1500 (2019).

81. *See* Ari Ezra Waldman, *Privacy Law's False Promise*, 97 WASH. U. L. REV. 773, 784 (2020); *see also* Richards & Hartzog, *supra* note 80, at 1499.

82. Woodrow Hartzog, *BIPA: The Most Important Biometric Privacy Law in the US?*, *in* REGULATING BIOMETRICS: GLOBAL APPROACHES AND URGENT QUESTIONS 96, 102 (Amba Kak ed., 2020).

83. For discussions of user interface designs that deceive users into making unintended, harmful choices, see generally Arunesh Mathur, Gunes Acar, Michael J. Friedman, Eli Lucherini, Jonathan Mayer, Marshini Chetty & Arvind Narayanan, *Dark Patterns at Scale: Findings from a Crawl of 11K Shopping Websites*, 3 PROC. ACM HUM.-COMPUT. INTERACTION 1 (2019) (uncovering entities that offer dark patterns as a turnkey solution); Ari Ezra Waldman, *Cognitive Biases, Dark Patterns, and the 'Privacy Paradox'*, 31 CURRENT OPINIONS PSYCH. 105 (2020) (highlighting cognitive biases and discussing the ways in which platform design can manipulate disclosure behavior).

84. *See* Hartzog, *supra* note 82, at 103.

85. *See* Amy Kapczynski, *The Law of Informational Capitalism*, 129 YALE L.J. 1460, 1465 (2020).

officers, conducting data risk assessments and impact evaluations, and automating data breach notifications—as evidence of adherence to the law.[86] All the law does, then, is transfer regulatory monitoring to companies themselves, wedding a form of collaborative governance that shifts compliance enforcement out of regulators' hands.[87] Meanwhile, standard-setting organizations for emerging technologies—such as the Institute of Electrical and Electronics Engineers and the Organization for Economic Co-operation and Development—construct rules that blindly favor innovation and dispense with substantive consumer protections. These organizations thereby tout the same platitudes around ethics and transparency, entrenching companies' discursive apparatus.[88] Under this rubric, companies perform compliance for its own sake, circumventing legal scrutiny and disabling regulators from targeting—let alone identifying—companies' more deleterious practices.[89]

V. TOWARDS AN EMANCIPATORY FRAMEWORK FOR REGULATING BCIS

Well-meaning critics in technology policy circles espouse the view that the law lags behind emerging technologies.[90] But this view undermines how companies rely upon law to exercise power and shift the normative discourses that further entrench it.[91] It also fails to appreciate what law can protect. Legal regimes are better equipped to protect external manifestations, such as verbal utterances and written texts.[92] They are less able to govern internal practices, such as unspoken information, preconscious preferences, attitudes, and beliefs.[93] For this reason, neural data throws traditional precepts for privacy law into a frenzy. Unlike most protected categories of information, it pertains to unexecuted behavior, inner speech, or non-externalized actions that elude conscious control and prove difficult to intentionally seclude.[94] Indeed, the

86. *See* Waldman, *supra* note 81, at 815.

87. *Id.*; *cf.* Waldman, *supra* note 11, at 1227 ("Perhaps most importantly, the performative use of a managerialized public-private partnership is internally inconsistent: it endogenously creates public institutions that are dependent on industry expertise, efficiency, and nimbleness. Therefore, those public institutions become incapable of acting as the promised 'backdrop threat' that guards against capture.").

88. *Cf.* Waldman, *supra* note 9, at 1242–43 (discussing privacy's collaborative governance model between public and private actors).

89. Waldman, *supra* note 81, at 815.

90. ZUBOFF, *supra* note 63, at 103.

91. *See* Amy Kapczynski, *The Law of Informational Capitalism*, 129 YALE L.J. 1460, 1465 (2020); *see also* COHEN, *supra* note 68, at 44.

92. Ienca et al., *supra* note 49, at 6.

93. *Id.* at 6–7.

94. *Id.* at 6.

process of extracting neural data compels disclosures that users retain interest in self-regulating. Resistance against these emerging forms of corporate manipulation therefore requires multivalent approaches.

First, attempts to remedy BCIs' privacy harms must draw attention to the technology's data practices. Recently, privacy professionals have endeavored to operationalize data minimization principles to reduce the extent of data required to empower their technologies and delete such data once they completed using it for its intended purposes. But the principle remains a platitude so long as it remains abstract and without context. Indeed, while it may guide privacy professionals to think more intentionally about their data practices, it does little to inform or constrain data practices themselves, including collection, disclosure, and retention. To paraphrase Ari Waldman, privacy professionals converted data minimization into a performative gesture to reduce regulatory investigations and litigation; that is, the principle became understood more in terms of reducing "corporate risk" than risks to consumers.[95]

Second, advances in legal protections only remain viable to the extent that they parallel ongoing engagement with neuro-ethicists, human rights advocates, and other stakeholders. For example, the Morningside Group comprises a team of interdisciplinary experts—including physicians, ethicists, neuroscientists, and computer scientists—that structured a set of human rights-centered ethical principles to guide research on BCIs and provide technical know-how to lawmakers.[96] Applying a multi-stakeholder perspective, these varying areas of expertise converge to produce more robust understandings of near- and long-term implications for emerging neurotechnologies. As such, regulators should rely on researchers in the BCI space to play an integral and ongoing role in informing legal frameworks for protecting neural data, ensuring that these frameworks keep pace with the technology's innovation.

Finally**,** on the legal side, protections for our neural data must strive to articulate safeguards to mental privacy, personal identity, free will, and

95. *See* Waldman, *supra* note 81, at 800.

96. Rafael Yuste, Sara Goering, Blaise Agüera y Arcas, Guoqiang Bi, Jose M. Carmena, Adrian Carter, Joseph J. Fins, Phoebe Friesen, Jack Gallant, Jane E. Huggins, Judy Illes, Philipp Kellmeyer, Eran Klein, Adam Marblestone, Christine Mitchell, Erik Parens, Michelle Pham, Alan Rubel, Norihiro Sadato, Laura Specker Sullivan, Mina Teicher, David Wasserman, Anna Wexler, Meredith Whittaker & Jonathan Wolpaw, *Four Ethical Priorities for Neurotechnologies and AI*, 551 NATURE 159, 160 (2017).

equitable access to technologies that augment human capacities.[97] As of October 2021, Chile became the first country to protect these "neuro-rights," pioneering a regulatory framework to govern against manipulation of brain activity.[98] Chile amended its constitution to define mental identity as a right against manipulation. The right requires that any intervention—including for medical purposes—must be regulated.[99]

As the first country to protect neuro-rights, Chile sets an example for others to emulate. In addition to its constitutional amendment, the country modeled several principles that apply across all contexts for BCI development. First, Chile's right to mental privacy develops a starting point for ensuring the secure collection and maintenance of neural data. Any sale, commercial transfer, or use of neural data must adhere to strict regulation. Second, users retain a right in personal identity, such that technologies may not interfere with users' sense of self. This may occur when, for example, users are incapable of processing whether their actions derive from personal or technological input. Third, providing for a right to free will, Chile requires that users retain control over their own decision-making capacity without unknown influence from external devices. And finally, by granting a right to equal access to mental augmentation, the country seeks to establish guidelines at domestic and international levels for regulating the development and application of BCI devices.

To the extent that existing privacy laws prove insufficient in their definitions and scope to protect neural data, regulators should consider explicit protections for such data in advance of BCIs' fast-paced development. Such prophylactic regulation informs technological development and ensures that it maintains an emphasis on users' safety and privacy interests. In this instance, innovation may not be at odds with regulation; the two would co-develop BCI technologies so that they enable users to experience a diversity of human experiences.

As technological development draws human-machine synergies nearer, regulators have ample opportunity to ensure that such technologies enhance rather than displace these experiences. These efforts should, on the one hand,

97. Neeraja Seshadri, *Chile Becomes First Country to Pass Neuro-Rights Law*, JURIST (Oct. 2, 2021), https://www.jurist.org/news/2021/10/chile-becomes-first-country-to-pass-neuro-rights-law/.

98. Nayef Al-Rodhan, *The Rise of Neurotechnology Calls for a Parallel Focus on Neurorights*, SCI. AM. (May 27, 2021), https://www.scientificamerican.com/article/the-rise-of-neurotechnology-calls-for-a-parallel-focus-on-neurorights/.

99. Elena Blanco-Suarez, *"Neurorights" and Why We Need Them*, PSYCH. TODAY (June 25, 2020), https://www.psychologytoday.com/us/blog/brain-chemistry/202006/neurorights-and-why-we-need-them.

enable the expansion of medical and rehabilitative uses while, on the other hand, limiting the use and disclosure of neural data to only the data controllers and their vendors that are necessary to ensure the devices' functionality. In short, this limits the possible disclosures for neural data and offsets the possibility that such data will be used for ancillary third-party purposes, such as profiling, targeted advertising, or behavioral analytics.

Finally, regulators should broaden enforcement efforts with a private right of action. Elsewhere I have argued that a private right of action empowers consumers to protect their privacy without regulators' intervention.[100] Rather than rely on under-resourced enforcement agencies, consumers should leverage such a private right of action as a self-help mechanism for shaping industry behaviors. Indeed, while regulators may set the foundation in law for consumer protections, consumers—with the aid of the plaintiffs' bar—may take the mantle in courts to ensure adequate enforcement for mental privacy.

VI. CONCLUSION

At their core, BCIs dispossess users of their thoughts and displace them from the mind into actionable outputs. Through this digital process, the space between intention and action draws nearer, eliminating the antecedent reflective capacity necessary to instantiate action. As this Note discussed, the result fundamentally reconstitutes our person into an assemblage of disembodied agency, wherein the body acts through a sequence of automatisms. Such automatisms habituate thought and delimit the possibility to engage in conscious reflection, the precursor to meaningful expression.

As Anders Dunker wrote, "the brain has become the nexus of an intensified political struggle due to the repercussions of cognitive capitalism."[101] Our political economy enables companies to engage in uninhibited data extraction, with deficits in legal infrastructure privileging such practices. Where the law lacks, government actors defer to industry self-regulation that, in turn, informs the normative underpinnings to doing privacy. Indeed, in the absence of substantive policy overhauls—at the legal and normative levels—companies' power to manipulate our social embodiments will continue unchecked.

Perhaps most critically, resistance must engage with existing liberatory practices on the ground. The problem exceeds the emergence of any particular

100. *See* Daniel Levin, *Face the Fact, or Is the Face a Fact?: Biometric Privacy in Publicly Available Information*, 32 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 1010, 1015 (2022).

101. Anders Dunker, *The Neural Battlefield of Cognitive Capitalism*, L.A. REV. BOOKS (Nov. 6, 2020), https://lareviewofbooks.org/article/the-neural-battlefield-of-cognitive-capitalism/.

technology; it traces a longstanding political struggle against total administration. Indeed, as the Marxist adage goes: to be radical is to grasp the root of the matter.[102] Writing in 1964, Herbert Marcuse articulated how a burgeoning technological society generated false needs and integrated consumers into its world of thought and behavior.[103] Through existing systems of production and consumption, emerging innovations engender corporate power and displace aptitudes for critical thought, producing "mechanics of conformity" that assimilate consumers into a one-dimensional universe predicated on corporate norms.[104] For Marcuse, the only adequate solution requires the "Great Refusal—the protest against that which is."[105]

Today, practicing the Great Refusal requires us to deconstruct what Alex Campolo and Kate Crawford called "enchanted determinism"—the epistemological flattening of complexity into clean signal for the purposes of prediction.[106] As Crawford wrote, emerging technologies—especially those integrating AI and machine learning—are seen as enchanted yet deterministic, deducing patterns that we treat with predictive certainty.[107] Shrouded in veneers of science and truth, these technologies sublimate existing power structures and invert the starting assumption that these technologies act on us, taxing our limited attentional flows.

Under this rubric, emerging uses for neurotechnologies perpetuate age-old privacy concerns, undermining our integrity to exercise agency in and through our person. Positioning their growing innovation in this context enables us to identify how companies recapitulate profit motivations through new forms of data extraction and manipulation. By ascribing an essential interiority to our person, these technologies not only predict, but preempt the possibilities to exercise alternative subjectivities. Legislating new protections for new categories of data offer a starting point, however insufficient they may be. But the struggle calls for a grander vision, one that imagines new ways of relating to each other absent corporate-facilitated mediations and technologies.

102. KARL MARX, EARLY WRITINGS 52 (Rodney Livingstone & Gregor Benton trans., 1992).

103. HERBERT MARCUSE, ONE-DIMENSIONAL MAN xii (Beacon Press 1991).

104. *Id.* at xx.

105. *Id.* at 66.

106. CRAWFORD, *supra* note 48, at 213.

107. *Id.*