Gordon Tullock Meets Phineas Gage: The Political Economy of Lobotomies in the United States

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ABSTRACT
In the late 1940s, the United States experienced a "lobotomy boom" where the use of the lobotomy expanded exponentially. We engage in a comparative institutional analysis, following the framework developed by Tullock (2005), to explain why the lobotomy gained popularity and widespread use despite widespread scientific consensus it was ineffective. We argue that government provision and funding for public mental hospitals and asylums expanded and prolonged the use of the lobotomy. We support this claim by noting the lobotomy had virtually disappeared from private mental hospitals and asylums before the boom and was less used beforehand. This paper provides a more robust explanation for the lobotomy boom in the US and expands on the literate examining the relationship between state funding and scientific inquiry.

KEYWORDS
Lobotomies, economics of science, public choice, political economy, mental health

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1. Introduction

In 1952, smoking rates plummeted after an article published in *Reader's Digest* linked smoking to an increased risk of developing cancer. Decreases in smoking rates were further promulgated with greater news coverage of the scientific literature (Pierce and Gilpin 2001) and a 1964 report from the Surgeon General. Although scientific discovery motivated changes in behavior, the *Reader's Digest* article was written long after scientists formed and accepted the same hypothesis. Scientific acceptance that smoking is associated with cancer dates to the 1930's.

Understanding the factors which delay the application of accepted scientific discovers, especially medical discoveries, is crucial to avoid prolonging the use of comparatively less effective or erroneous medical treatments (March 2017). A well-known and troublesome example of an ineffective medical procedure used for a prolonged period is the use of the lobotomy to treat mental illness in the US. Even with the last lobotomy in the US performed 50 years ago, it serves and an enduring example of the widespread use ineffective and harmful medicine (Holden 1973).

Few procedures in medical history are as reviled as the lobotomy. The period it was most often used, often called the "lobotomy boom" (Holden 1973, p.1109), is still described as part of the dark history of psychosurgery and mental-health provision in the US, the lobotomy. Some have called it one of the most spectacular failures in the history of medicine (Johnson 2009, p. 367) and more lunatic itself than the patients it was supposed to help (Havens 1973 p. 352).

Surprisingly, the lobotomy was also scorned reviled during the time it was used. By the early 1940s, about 5 years after the first operation, a consensus formed among medical professionals of various medical specialties that there was little evidence the procedure helped patients (Holden 1973). It was denounced by the AMA in 1941 (before the boom). Despite this scrutiny, approximately 50,000 lobotomies were performed in the US from 1936-1972.[1]

One of the most accepted explanations for the longevity of lobotomy in the US is that physicians were unaware the procedure was ineffective at the time. This seems unlikely considering the amount of criticism it received before and during its rise in popularity. Another common explanation is that, although physicians knew the procedure was questionable, it was used due to a lack of other effective treatment methods. This explanation also faces historical scrutiny. Although many of the treatment methods for mental illness at the time were spurious, psychoanalysis and electroshock therapy were available and still used today (Valenstein 1986). Further, in 1890, under the direction of Swiss physician and asylum director Gottlieb Burkhardt, lobotomized six of his patients in 1890, when comparatively fewer treatment options for mental illness were available (El-Hai 2005).[2] Burkhardt's efforts were severely criticized, and he was eventually ostracized from the medical community.

Evidence against these popular theories suggests the widespread use of the lobotomy was the result of institutional factors motivating the misuse of an ineffective practice rather than a lack of options or knowledge. In this paper, we analyze the institutional settings where physicians determined whether to use the lobotomy to provide a more robust explanation to why the lobotomy was so popular and widespread despite medical consensus working against it.

To perform our analysis, we utilize the framework developed by Tullock (2005) in his *The Organization of Inquiry*.[3] Tullock's extension of economic reasoning to the process of scientific research and how research is applied to solve social problems allows us to examine the incentive structures facing physicians stemming from different payment systems under varying institutional structures. In this paper, we propose the longevity and popularity of the lobotomy in the US was the result of the incentives generated by the institutional structure of mental health provision. Primarily, we make note that funding in public medical establishments (including mental hospitals and asylums) was on a very low per capita basis which constrained revenues. Since

[1] Lobotomy use dramatically decreased when the FDA approved Thorazine in 1954.

[2] Although the term did not exist at the time, Burkhardt attempted to remove parts of the brain to alleviate mental illness, effectively serving the same purpose as a lobotomy.

[3] We also make use of the framework developed by Kealey (1996), but to a lesser extent. When historical documents are unable to provide data, we rely on the work of Valenstein (1986), Pressman (2002), El-Hai (2005), and findings from medical journals over the relevant period.

lobotomized patients were easier to manage (their brain damage often made them docile), and the procedure was comparatively cheaper than other treatment methods (El-Hai 2002), it became a popular means toward minimizing costs and patient conflict. In contrast, physicians operating within private medical establishments were funded by the patients, their caregivers, or through philanthropic donations. Because these funds could be reduced if physicians did not provide adequate care or used an ineffective practice. As a result, different institutional settings generated dramatically different outcomes.

This paper proceeds as follows. In section 2, we explain the practice of lobotomy and introduce the puzzle of why the practice persisted for so long. In section 3, we adapt Tullock's (2005) framework to the incentive structures physicians faced when deciding to use or not use the lobotomy. Section 4 applies the framework through the institutional comparisons of the two systems. Section 5 concludes and provides implications for the current relationship between government funding and scientific discovery as well as proposed future research.

2. Literature Review

The lobotomy represents a set of surgical procedures which remove or destroy brain tissues as a treatment method for mental illnesses.[4] The first lobotomies performed on human beings consisted of injecting alcohol into the prefrontal cortex to destroy tissues (Pool 1954; Gross and Schafer 2011). The procedure was later used to treat mental illness when it was adopted by physician Egas Moniz in the 1930's. Moniz, following some psychiatry research which found behavioral changes in chimpanzees whose brains were purposefully damaged, hypothesized that removing brain tissues in humans could alleviate mental illness. In the 1930's Moniz's procedure was adopted by Walter Freeman and James Watts who championed its use in the US.

Freeman and Watts performed a disproportionately high amount of the total lobotomies performed in the United States. Ten years after Moniz conducted his first lobotomy, Freeman boasted that he had already conducted 400 lobotomies (Freeman and Watts 1946 p. 293). To cut down on procedure time and avoid some surgical risks, Freeman developed the transorbital lobotomy procedure in 1945. This version of the lobotomy involved inserting an icepick into the patient's nostril or eyelid to destroy brain tissue rather than opening the skull to remove tissue.[5] By 1957, Freeman claimed to have performed some 3,000 lobotomies with 600 being pre-frontal and 2,400 transorbital (Freeman 1957).

The lobotomy gained swift popularity during the late 1940's and early 1950's. However, there was a strong reaction against lobotomies from the beginning well before this period. In 1941, the American Medical Association published an editorial naming five important critics of the procedure in order to sustain the claim that no one could assert whether or not this was a worthwhile procedure (Anonymous 1941).[6] Gradually, physicians became increasingly skeptical well before the boom, the criticisms had crystallized and were beginning to seep within the popular presses (Robinson 1946; Goldstein 1950; Kucharski 1984; Diefenbach et al. 1999; Pressman 2002 El-Hai 2005).[7] Writing in 1949, Burlingame noted a "world-wide scrutiny" developed over the procedures effectiveness (p. 141). Yet, according to the available data, the practice soared despite the criticisms and the use of the lobotomy continued well after it fell out of favor with the medical profession (Pressman 2002, Valenstein 1986).

As noted above, most explanations for this puzzle in US medical history emphasize a lack of knowledge or lack of alternatives (Worthing et al. 1949; Valenstein 1986; Pressman 2002). Noting the persistent criticism from medical professionals and the historical precedence where the lobotomy failed the gain popularity, both

[4] In the medical literature, "mental illness" is also called mania, mental disturbance, and insanity.

[5] Other devices were used in different hospitals. However, Freeman typically used an icepick (El-Hai 2005).

[6] Freeman and Watts faced considerable criticism before the 1940's as well (El-Hai 2005)

[7] Although the procedure faced considerable ethical criticism (El-Hai 2005), we focus on the scientific criticism in this paper.

explanations are limited. We now turn an alternative framework which emphasizes incentives and institutional structures rather than a lack of knowledge.

3. Institutions and Incentives in Scientific Inquiry

Incentives matter in scientific research, discovery, and in the distribution of research findings. As Adam Smith noted, professors in Scotland and Oxford produced vastly different learning experiences for students. Although both were equally competent in their fields, professors in Scotland produced "the best seminaries of learning that are to be found anywhere in Europe" (Rae 1895 p. 273). Oxford professors' lectures languished in comparison. Smith's explanation for the diverging quality stemmed from the differences in compensation between the university's institutional structures. Primarily, Scottish professors were remunerated based on subscriptions to their classes while Oxford professors were salaried from endowments.

Tullock (2005), in addition to citing Smith's example, also expands Smith's insight to encompass the broader production and adoption of scientific knowledge by. In *The Organization of Inquiry*, Tullock (2005) divides the scientific community into two ideal types: applied and pure scientists. The applied scientists' primary objective is to utilize science discovery for personal gain. These personal gains include influencing peers in the broader scientific community (2005, p. 24) and earning financial rewards for pursuing research of interest to those outside the scientific community. By performing the latter, applied scientists serve an additional entrepreneurial role by attempting to assess the value of scientific discovery for the public. The pure scientists' research directed more so toward expanding the theoretical body of scientific knowledge (2005, p. 10).

Although the applied and pure scientists'' research objectives differ, both play a complementary role in advancing the application and theoretical foundations of their disciplines (Tullock 2005, p. 33). As Tullock (2005) describes: "The scientist's curiosity is subject to social guidance. The information inputs from other scientists are important in shaping the problems which he will investigate. Similarly, he is normally interested in the approval of his peers and hence will usually consciously shape his research into a project which will pique other scientists curiously as well as his own" (p. 25).

This regard, Tullock likens the process of scientific research and inquiry to the unhampered market process in economics.[8] Although applied and pure scientist pursue different goals, lines of research, and differ on a variety of other margins, their efforts are coordinated toward advancing the broader scientific body of knowledge. Similarly, the market process coordinates the actions of different actors pursuing their self-interest toward cooperative efforts to advance the nexus of exchange. Tullock is not the only one to notice these similarities. Polanyi (1951, 1962), Kealey, (1996), Butos and Boettke (2002), and March et al. (2016) also compare the coordinating mechanisms of the market process to the institutional structure of scientific research.

However, as Tullock notes, the scientific community does not use the price system to coordinate disparate actions as successfully as the market economy.[9] As such, scientists rely on different institutional mechanisms to decipher productive from unproductive uses of research resources and guide research efforts toward comparatively more fruitful research projects. The key mechanism he specifically emphasizes is the ability of the scientific community to assess the verification (accuracy) of new discoveries. The verification process is largely performed by scientists who are considered experts in their fields of study. These experts earn their reputation from their peers and perform their verification role by serving in leadership positions for academic journals, research organizations, and through other professional capacities. If a scientist's discovery is verified by his peers, it gains acceptance from the broader scientific community.

Another institutional mechanism is implemented when scientific discoveries implemented by other scientists in their research. This secondary "dissemination" process serves as a means to bolster current research lines and to find shortcomings or limitations to new discoveries in applied research. To Tullock (2005), the verification and the dissemination mechanisms imperfectly provide the role prices perform in the

[8] In his own words, "The most efficient way of 'organizing' science seems to be the most perfect laissez faire" (p. 5).

[9] See Hayek (1945).

market.

However, like the mechanisms of the market process, the scientific communities' verification and dissemination mechanisms are less effective if they become distorted. Primarily, when the institutional structure changes the mechanisms which reward or punish scientific research, scientist's incentives change. These institutional changes can result in promoting scientific avenues of research before they are validated by scientific peers (Taubes 2007). Consequently, the verification mechanism's role in preventing the advancement of erroneous scientific discoveries becomes less effective (Kealey 1996). In addition, erroneous discoveries are more likely to permeate other research areas which distorts the dissemination mechanism (Tullock 2005).

This is not to say less effective institutions will allow comparatively less effective science to perpetuate indefinitely. Scientific errors will be found redirected (Tullock 2005). However, when new theories are distanced from the institutional mechanisms within the scientific community prolongs the verification and dissemination of erroneous discoveries.

Previous literature examining distortions in scientific research and its impact on the advancement of science bolsters Tullock's framework. Taubes (2007) finds financial incentives tied to researching dietary advice advanced by the USDA likely prolonged incorrect nutritional hypotheses associating fat consumption with heart disease. Kealey (1996) notes universities and scientists can serve in a powerful lobbying capacity, working to steer resources away from scientific inquiry and into securing state favors and funding.[10] As a result, the author found higher decreasing returns to public research funding and less research diversity which hinders discovery.

Extending Tullock's (2005) framework to examine the lobotomy is fruitful for several reasons. First, because the lobotomy was used beyond the point when medical professionals (scientists) deemed it ineffective, indicates there were distortions in the verification and dissemination mechanisms.[11] Further, when examining historical documents provided by the National Institute for Mental Hygiene (hereafter NIMH), there is a clear difference in popularity and longevity regarding the lobotomy's us in private mental hospitals and asylums compared to public. This provides further reason to suspect institutional structures played a prominent rule directing incentives to lobotomize patients.

4. The Institutional Structure of Mental Hospitals and Asylums

Pressman (2002) notes "the kinds of evaluations made as to whether psychosurgery [lobotomies] worked would be very different in the institutional context than it was in the private practice context" (p. 145). Primarily, the way public mental hospitals and asylums were funded provided stronger incentives to use the lobotomy in comparison to private establishments. We now review the institutional framework for public and private medical establishments deciding whether to use the lobotomy.

Public Institutional Structures

According to the NIMH, the staff to patient ratio increased from 16:1 in 1938 (NIMH 1941 p. 5, p. 77), 21:1 in 1952 (NIMH 1952 p. 14, p. 66). Because funding formulas for state hospitals and asylums were, for the most part, fixed at the state-level on a *per diem* basis, low-cost methods of treatment were preferable from a financial standpoint. Further, because state budget allocations were insufficient to cover expenses in the post-war era (Grob 2014 p. 78, p. 172), low-cost procedures were highly desired as a cost-minimizing method to keep hospitals and asylums solvent.[12]

[10] Tullock (2005) notes the same distortions affect scientists in the private sector trying to secure public research funds.

[11] As noted below, dissemination mechanism breakdowns include favorable and misleading coverage from popular press outlets as well as numerous adaptations of the procedure (El-Hai 2005).

[12] However, medical historians note Valenstein (1986) notes, nearly 60% of their budgets were allocated to staff salaries. Pressman (2002) finds similar financial structures were used in public asylums before the 1900's and also notes those in management positions within asylums frequently had higher incomes than

With limited resources and state-based funding tied to occupancy, physicians within public hospitals and asylums faced strong incentives to minimize treatment costs and time spent with comparatively more difficult to treat (or manage) patients.

The lobotomy helped advance these objectives. First, it was a comparatively cheaper alternative to many other available treatment methods. This is especially true of the transorbital lobotomy which was introduced by Freeman in 1946 as a quicker and less difficult way to lobotomize patients (El-Hai 2005). Unlike other forms of treatment which were administered over multiple rounds, the lobotomy was, in theory, a onetime procedure. [13] It was also common for lobotomized patients to become more docile and easier to manage (Freeman 1957). Freeman (1957) also noted patients were more likely to be discharged after a lobotomy, which could ease the burden of an overcrowded facility.

Physicians in public asylums and hospitals faced little repercussions for their actions because their funding was largely based on the number of patients rather than if the patients received adequate medical care. Further, public asylums and hospitals in some states held the right to perform lobotomies without obtaining the patient's (or legal caretaker's) and could also refuse visitation rights (Rothman 1971, Pressman 2002). Pressman (2002) notes professionals working within the state hospital system were "conflicted between, their roles as medical professionals and as hospital administrators" (p. 209). In short, there was a conflict between the scientific standards set by their medical peers and their financial support.

Minimum costs treatment techniques were also in accordance with the desires of superintendents and government officials. Both monitored the distribution of treatment and were much less concerned with the effectiveness of treatment (Rothman 1971). In some instances, public hospitals would document the number of lobotomies performed to indicate patients received treatment (Pressman 2002). Further, because federal funding financially rewarded physicians in public hospitals and asylums to use less costly and less effective treatments, criticisms from the medical community became less important for professional recognition. Acting as applied scientists implementing potentially erroneous methods of treatment, physicians within public medical establishments' source of funding likely clouted the way their craft determined scientific use and validity (Tullock 2005 p. 29). Publicly owned asylums, whose patients are involuntarily checked in, were similarly less receptive to scientific scrutiny of their treatment methods because their profits were also obtained through minimizing costs rather than finding effective treatments.

Private Institutional Structures

In contrast to physicians in public medical establishments, physicians in private settings faced strong incentives to utilize treatment methods which demonstrated success and to understand the treatment's soundness or limitations. As physicians financially benefited by deciphering which methods were likely to help their patients, engaging with their medical peers was advantageous. Similarly, physicians risked financial losses and reputational damage for using ineffective treatment methods. These institutional mechanisms served to motivate physicians to exercise caution when selecting a treatment method, they felt was unproven or potentially harmful.

Although physicians either directing or working for private mental asylums faced slightly different incentives than those in private practice, they too faced steep financial and reputational costs by taking excessive risks when treating patients. Reputational damage to the asylum could result in donors withdrawing their financial support, decreases in voluntary enrollment (typically a large percent of patients), or

physicians in other medical disciplines.

[13] Patients frequently returned to asylums after their troublesome behaviors resurfaced, which resulted a second lobotomy. Patients receiving three or four lobotomies was not unheard of. (El-Hai 2005).

caregivers removing committed patients. Second, many of those physicians were disciplined by participating in medical societies where their research was discussed.

This is not to say physicians in the private sector never made errors. Erroneous treatment methods were used by physicians in all settings (Pressman2002). However, incentives faced by physicians in private settings were comparatively better aligned to exercise caution than in public asylums.

The Lobotomy in Practice

In the late 1890's and early 1900's, the psychiatry and neurology disciplines underwent a large-scale lobbying effort calling for an increased government role in promoting mental health and providing publicly provided care for mentally disturbed patients (Rothman 2002; Pressman 2002; Burnham 2015). The figurehead of the movement was Adolf Meyer who worked to unify the fields of psychiatry, psychology, and neurology under the banner of "psychobiology" (Pressman 2002). Myer's hope was to secure a larger role for these disciplines in the broader medical community by obtaining more political clout. As part of his vision, Myer sought to redefine the role of providing mental health care as caring for patients while simultaneously providing public health efforts to prevent insanity (Rothman 1971; 2002; Pressman 2002).

A consequence of this lobbying effort was to redirect physician's efforts into political rather than scientific or medical avenues. Through professional contacts within government, Meyer and his political supporters secured financial support to establish a large network of state hospitals (with psychiatric wards) and increased funding for state asylums. Whereas most federal funds for scientific research in the United States since the Civil War were for agricultural purposes (Kealey 1996 p. 148), the 1930s witnessed the advancement of a larger, federally directed, effort to provide larger scale public health (Burnham 2015). The result was a swift increase in public hospitals and publicly funded asylums (Pressman 2002; Burnham 2015).[14]

In addition to increased federal financial support, Meyer's vision also promulgated efforts at the state level to reform public health policy. Rothman (2002) notes many states worked to reform their commitment laws while federal financial support increased. These reforms worked to decrease the difficulty (in steps and rigor) of having patients involuntarily committed. New York, which consistently contained the most committed patients at the state level, was a prime example (Pressman 2002). Patients who were involuntarily committed typically resided in state hospitals. However, to relieve the hospital staff of the overcrowding burden, many patients were sent to state asylums for observation (Pressman 2002).

Increased levels of committed patients, stemming from increased government funding for mental healthcare and comparatively easier commitment laws, promoted a sharp increase in demand for the services of mental institutions (Rothman 1971). From 1920-1940 the population of patients committed for "causes of retardation" in public hospitals and asylums increased nearly 167%, from 50,000 to 113,000 (Nelson and Crocker 1978 p. 1039). However, when we include other patients, the population increases to 481,000 (an over 850% increase) in 1940 (NIMH 1952 p.14). Overall, from 1900-1950, the inpatient population had increased nearly four-fold (Bassuk and Gerson 1978). [15]

Mental hospitals and asylums were ill-equipped to handle the rapid influx of patients (Valenstein 1986; El-Hai 2002). In some cases, hospital directors and physician staff had no experience treating mental illnesses (Rothman 2002). Overcrowding in mental healthcare facilities was commonplace where national patient overpopulation rates increased from 7.1% above capacity in 1926 to 9.4% in 1938 (NIHM 1941 p. 75), 12.5% in 1945(NIMH 1948 p. 26) and 18.1% in 1949 (NIMH 1952 p. 68). Despite widespread complaints regarding a lack of public funds, public expenditures for mental health increased substantially. From 1946-1960, average expenditures per patient (adjusted for inflation) increased 153.5%. Between 1946-1950 (during the lobotomy boom) expenditures per patient increased 43.4% (Grob 2014 p. 164).

Federal funds tied to patient populations combined with incentives to cost

[14] Although historically public asylums were common (Rothman 1971), they became significantly more common after the 1900's (Pressman 2002).

[15] Over the same period, the United States population increased by less than 30%.

minimize treatment expenditures per patient motivated the use of the lobotomy. Physician Mesrop Tarumianz, a superintendent of Delaware State Hospital, provides evidence that public hospitals responded to these incentives where, during a 1941 panel discussion at the American Medical Association, he noted:

> "From an Economic point of view, I should like to give some figures as to what this may mean to the public. We have the following conclusions with regard to our own cases: In our hospital, there are 1,250 cases and of these about 18 could be operated on for $250 per case. That will constitute a sum of $45,000 for 180 patients. Of these, we will consider that 10 percent, or 18, will die, and a minimum of 50 percent of the remaining, or 81 patients will become well enough to go home or be discharged. The remaining 81 will be much better and more easily cared for the in hospital. Thus the hospital will be relieved of the care of 99 patients. That will mean a savings $351,000 in a period of ten years." (Pressman 2002 p.162)

Further, an article in the Stanford Law Review (1949) insisted, without legal action, the conflict of interest faced in public hospitals and asylums would result in the procedure being used for physician's best interests and not their patient's. For instance, the operation could be a satisfactory means of controlling obstreperous inmates even when unsuccessful in rehabilitating the patient. The over-crowded facilities and lack of funds characteristic of many state institutions supply a strong incentive for such action. (1949; p. 471). In the 1950's several prominent physicians, some of which previously supported the limited use of the lobotomy would come to agree the procedure was overused (Pressman 2002).

There was a disconnect between the verification and dissemination mechanisms during and after the lobotomy boom. Freeman's work to promote and use the lobotomy exemplifies this institutional failure. Freeman was opposed by medical professionals from numerous disciplines who were skeptical at first (advocating limited use) and openly hostile as the boom took place (Valenstein 1986; El-Hai 2005). Many of his earliest detractors criticized the anatomical soundness of the lobotomy (El-Hai 2005).[16] Freeman's original presentation of his lobotomy research, at the Southern Medical Association in 1936, was met with severe criticism. He was on more than one occasion shouted down during other presentations (El-Hai 2005). His book, Psychosurgery, was rejected by two academic publishers before being published by a minor editing house.[17] When it was published, few medical journals accepted to review the book (El-Hai 2005). In one review, prominent neurosurgeon Loyal Davis harshly remarked, the "offhand manner in which this surgical procedure is described and discussed is no credit to the essayist as a surgeon, a pathologist, or one who is searching for scientific truth" (Pressman 2002 p. 81). In 1949, Psychiatric Quarterly depicted the use of psychosurgery as little more than a shot in the dark (Pressman 2002 p. 319). His other academic publications, according to Valenstein (1986) made little impact.

However, because Freeman was serving the purpose of controlling bureaucratic expenditures, Freeman was shielded in part from the costs of continuing with lobotomies. The superintendents of hospitals and other hospital administrators still spoke highly of him and hired him to perform lobotomies. Although the larger medical profession was highly critical of lobotomy procedure on its theoretical grounds, the longevity and popularity of its use can although criticism from the medical field be explained through institutional changes in the market for caring for the mentally disturbed. Where the incentives of those applying the lobotomy, techniques change and are less bound by the critical feedback of the scientific community.

In contrast, private practice physicians and physicians faced stronger incentives to exercise greater caution when administering treatment. Several medical historians note physicians in private practices were often hesitant to accept, and even critical of, new mental illness treatment methods. Valenstein (1986) notes the quick dismissal of infection theory in the 1920's. Infection theory, developed by Henry Cotton, medical director for a state hospital with a psychiatric ward, held mental illness was caused by infected body parts including teeth, tonsils, pituitary glands, and several sexual organs. Cotton's theory faced severe criticism from numerous physicians who challenged the theory on its biological soundness as well as the results he reported. Consequently, the

[16] Freeman himself admitted the theoretical soundness of the lobotomy was weak (El-Hai 2005).

[17] The publisher received many notes urging him not to publish the book (Pressman 2002).

theory was quickly discredited. Freeman struggled to have a successful private practice early in his career (El-Hai 2005).[18] Shortly after developing the transorbital lobotomy, Watts (his business partner) refused to work with Freeman on moral and scientific grounds (Valenstein 1986; El-Hai 2005). Freeman would spend the rest of his medical career traveling the country giving lectures and performing lobotomies outside his practice. His largest supporters in these endeavors were leading figures in public mental health establishments (Pressman 2002).

Pressman (2002) provides further evidence for great caution in private hospitals and asylums evidence for this incentive structure when he examines the use of the lobotomy at McLane Hospital, a private mental hospital in Massachusetts. He finds the medical staff engaged in a rigorous selection method and decision-making process whenever the procedure was considered. Physicians organized committees to discuss if the patient's condition warranted undergoing surgery and if all other treatment methods were truly exhausted. The committee also sought approval from the patient's family and the patient if possible. If the committee agreed and it often did not, that the lobotomy was worth the risk, the procedure took place in a separate hospital with a handpicked surgeon. Extensive procedures like these were rarely observed in public asylums where treatment discretion was at the hands of the superintendent (Pressman 2002). Although Pressman provides one example, his findings can be applied to private hospitals and asylums generally. In 1950 (the height of the lobotomy boom), only 6% of all lobotomies were performed in private settings.

5. Conclusion

The advancement of scientific inquiry and discovery, like the advancement of the market, relies heavily on an institutional structure. When effective, intuitional mechanisms in science guide efforts toward productive lines of research and away from erroneous ones. When these mechanisms are distorted, they are comparatively less able to perform these roles. As a result, scientific progress and discovery is hindered.

The lobotomy (and the lobotomy boom period) in the United States provides such an example. Using a framework to understand the institutional structure of the scientific community developed by Tullock (2005), we argue the prolonged use and popularity of the lobotomy stemmed from the incentives created by perverse institutions created by government financing mental healthcare. This contrasts with previous explanations which largely held the use of the lobotomy in the United States was due to a lack of knowledge and treatment methods. By emphasizing incentives stemming from institutional constraints in public and private mental healthcare, our hypothesis is better able to explain this puzzling episode in medical history.

We bolster our hypothesis by noting the historical trend for public hospitals and asylums to use the lobotomy despite widespread agreement by the medical community that the procedure was ineffective. Physician incentives within public settings were closer aligned to minimize on treatment costs resulting from the financial incentives set up by public funding. In contrast, physicians in private settings were less likely to use the lobotomy because they faced greater financial and professional costs when adopting ineffective treatment options. Using historical records and the findings of medical historians, we find evidence supporting our institutions and incentives based explanation for the use of the lobotomy in the United States.

This paper provides an alternative explanation for why the lobotomy was as so popular and as frequently used as it was. It also extends Tullock's (2005) framework into the medical sciences. However, our paper has broader policy implications for state-based funding of medical research, scientific research in general, and medical practice. Given our findings, the advancement of scientific inquiry and discovery (including falsifying erroneous discoveries) may be better attained with less state-led funding. In the case of

[18] He was able to support himself with his academic position at George Washington University (El-Hai 2005).

the lobotomy, state financing distorted medical professionals (acting as pure and applied scientists) ability dismiss the lobotomy as an ineffective treatment and deter its frequent use in mental healthcare.

Although this paper breaks ground in several ways, more research is needed to understand the role of intuitional mechanisms play in the scientific community. Extending Tullock's (2005) framework to understand how the lobotomy was used in Europe would be particularly fruitful. His framework may also be used to examine more contemporary health issues including preventative care, diabetes, or cancer research. Because all of these topics involve significant federally provided research grants (in the United States), they too may face similar distortions as the lobotomy.

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