

# A Link in the Ink: Mental Illness and Criminal Responsibility in the Press

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## ABSTRACT

Innovations in neuroscience are expanding the understanding of mental illness and social behaviors and are playing an increasingly important role in the courtroom. Media reports of these advances fuel their visibility in society, policy and law, but rely on communication strategies distinct from traditional scientific reporting. To understand this confluence in the context of neuroscience and law, we conducted a content analysis of US press articles published between 2000 and 2010. Our analysis shows a marked increase in neurobiological explanations for criminal behavior. Mental illnesses are poorly defined and are closely associated with criminal responsibility. Beyond the inherent limitations of communicating about mental illnesses as a single undifferentiated disease, this fundamental blurring by media coverage today may compromise the evidence that brain research brings to reducing stigma and discrimination in society and legal decision-making in the courts. We present the data supporting this assertion, and discuss remedies to these challenges.

**Key words:** *Mental illness, content analysis, neuroscience, law, responsibility*

## Introduction

Neuroscience is a fast-paced, multidisciplinary field, and the products of innovation in research are increasingly broadening the understanding of brain function. New imaging methods and novel measures of brain activity are rapidly advancing knowledge about psychiatric disorders and social behaviors. Some of these technological innovations are relevant for the courtroom, uncovering proofs of phenomena that were previously invisible (McArthur, Chute, & Villablanca, 2006), and revealing insights

into personality and behavior (Berntson & Cacioppo, 2000). Consequently, there has been a significant increase in the use of neuroscience findings in the courtroom (Silva, 2009). Reporting of courtroom proceedings in the media follows a communication style that differs from the communication of scientific information, and has the potential to have a powerful impact on the practical understanding of neuroscience by the legal system and the public.

A study by Racine et al. (Racine, Waldman, Rosenberg, & Illes, 2010) on contemporary neuroscience in the media highlights the weight attributed to neuroscience findings in defining how people see themselves and others. Their results suggest that the press fuels widespread enthusiasm and optimism for neuroscience research. The authors further highlight the need for close monitoring of media coverage to mitigate inaccurate or premature claims that could result in unrealistic expectations and understandings about their ethical, social and legal implications.

These findings come at a particularly important time for the field of neurolaw. Although the neologism was coined only recently (Wolf, 2008), the debate is old: philosophers, legal minds and neuroscientists have long discussed the influence of brain sciences on notions of personal responsibility, free will, the implications of predicting aggressive and violent behaviors, and the role of brain pathology in criminal responsibility (Simpson, 2005). While neuroscientists and legal scholars ponder the relationship between neuroscience and law, however, practical applications of neuroscience such as structural brain scans (Greely & Illes, 2007) and new functional imaging techniques have already entered the courtroom. As neuroscience and law become increasingly intermingled, we predict that communication by journalists about the possibilities and impact of this new relationship will follow suit. The importance of such a trend lies in the evidence that the attitudes of the public can be significantly shaped by the media (Dietrich, Heider, Matschinger, & Angermeyer, 2006; McClure, Puhl, & Heuer, 2010).

To understand the current state of media reporting of issues at the intersection of law and neuroscience and launch a discussion

of the ethical issues surrounding neuroscience communication, we conducted a hypothesis-generating press content analysis of articles containing law and neuroscience terms.

## Methods

We used the LexisNexis Academic database to generate the sample for our study. We searched for full-length articles in the English language in general news (major newspapers such as the New York Times), magazines (such as Oprah! Magazine), and legal news (such as Lawyers USA) in the US for the 10-year period spanning January 1, 2000 to December 31, 2009. To retrieve relevant articles at the intersection of neuroscience and law, we carried out a keyword search using the truncation operator (!) and used the following terms: (((brain! OR neuro! OR mind!) AND (legal! OR law! OR justice OR judici! OR crime OR crimin)). We removed duplicates and discarded articles that did not discuss neuroscience themes.

Each return was analyzed for content inductively (Denzin & Lincoln, 2005) by one coder using an intense coding strategy that followed a coding guide developed for our research objectives from a pilot analysis of a sample of the data. A second coder analyzed 20% of the sample to test for reproducibility. Intercoder reliability was tested using percentage agreement. Reproducibility was initially 80%, however disagreements in coding were settled by discussion and 100% consensus was reached.

The emergent coding structure comprised major themes defined following a preliminary examination of the sample (10%): 1) general features of the article, 2) technology, 3) thought and mind reading, 4) military, 5) consciousness, 6) criminal responsibility, and 7) brain damage. We further coded for emergent subthemes within each main theme. Individual codes represented the units of analysis. We used a rich coding strategy to permit multiple categorizations of articles as needed (Denzin & Lincoln, 2005).

To gain an in-depth insight into the concept of mental illness specifically, we applied a second-level coding strategy to all articles in the major newspapers category that included a mention of mental illness. For this subset of articles we searched for: 1) the presence of generalization to a group, 2) the attribution of responsibility to the occurrence of mental illness, and 3) the naming of specific mental illnesses. We used descriptive statistics to characterize the composition and the properties of our sample for both sets of analyses.

## Results

We accepted 496 unique articles for analysis (168 newspaper articles, 99 magazine articles and 229 legal news pieces).

*Effects over time:* Coverage of content at the intersection of neuroscience and law varied over time depending on the type of publication (Figure 1). The number of articles retrieved from newspapers more than tripled between the first half of the analysis period (2000-2004, 7 articles per year on average) and the second

half (2005-2009, 25 articles per year on average). To test for an effect of time, we used the non-parametric Spearman's rank correlation test. We found that while magazines and legal news did not show a significant increase in number of publications over time (magazines:  $p=0.105$ , legal news:  $p=0.202$ ), the number of newspaper articles relating to neuroscience and law significantly increased over the time period of analysis ( $p<0.001$ ). When pooling all types of publications, we also found a significant increase of articles over time ( $p<0.001$ ). Therefore, there is a significant association that is driven by newspapers.

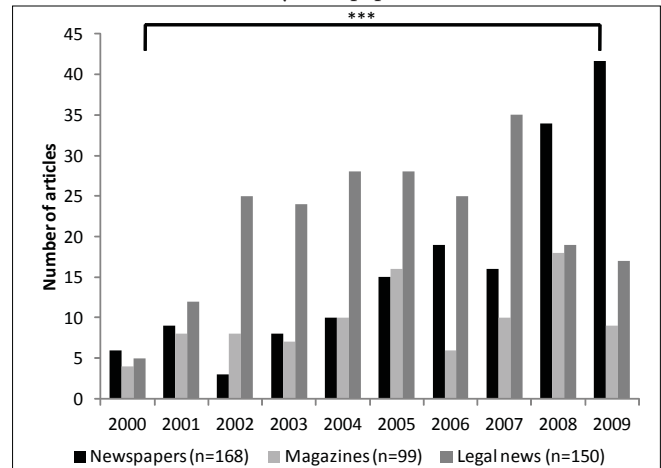


Figure 1. Articles at the intersection of law and neuroscience between 2000 and 2009. Number of articles retrieved per year using selected search terms for neuroscience and law for three categories of print media: newspapers, magazines and legal news. (\*\*\*)  $p<0.001$

*Content drivers:* We found different content drivers (themes that drive the reporting) in newspapers, magazines, and legal news (Figure 2). Single cases such as that of Terry Schiavo were the focus of the majority of newspapers articles (65%). Legal proceedings such as trial outcomes or the adoption of new laws defined a large majority of legal news articles (80%). Magazines offered the most balanced landscape with 29% of all articles focused on a single case, 27% on discussions of research and technology (e.g., functional Magnetic Resonance Imaging for lie detection) and 32% on discussions of the legal system (e.g., the death penalty for juvenile offenders). To assess whether there was a significant association between content drivers and types of media, we conducted a Pearson's chi-squared test for independence. We found that there is a significant difference in the distribution of content drivers between each type of media ( $p<0.001$ ).

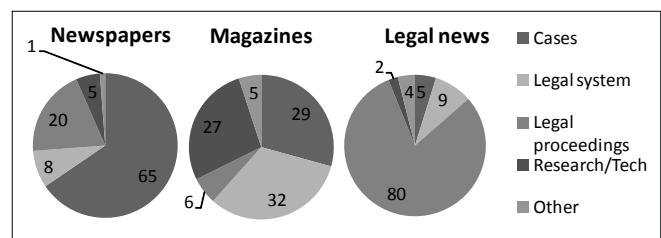


Figure 2. Content drivers for the reporting at the intersection of law and neuroscience. Categories of motivators for the reporting at the intersection of neuroscience and law for each type of print media. Values are expressed as percentages of total articles for each type of media.

*Content themes:* The main emergent themes were: 1) technology, 2) mind reading, 3) military, 4) consciousness, 5) responsibility, and 6) brain damage. Their distribution was relatively similar across newspapers and magazines (Figure 3A). Responsibility was the most prevalent theme in both of these types of publications, with a mention in 70% of all newspapers articles and 60% of all magazine articles. Within this responsibility theme, we identified several subthemes: 1) juvenile justice, 2) brain development, 3) early trauma, 4) insanity, 5) mental illness, 6) free will, 7) neurological damage, and 8) substance abuse (Figure 3B). For all three categories of publications, mental illness was the most prevalent subtheme found, appearing in nearly half of all newspaper articles (46%), 40% of magazine articles, and 12% of legal news. The subtheme of neurological damage appeared in 35% of newspaper articles, 20% of magazine articles and 9% of legal news. Mental illness and neurological damage often co-occurred in a given newspaper article (60% of all articles). All other subthemes appeared in 10-20% of newspaper or magazine articles and 1-5% of legal news.

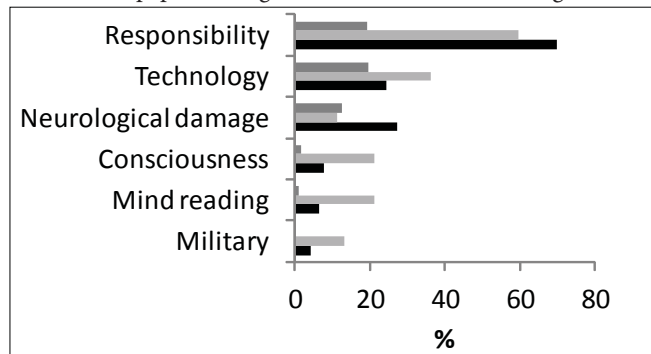


Figure 3A.

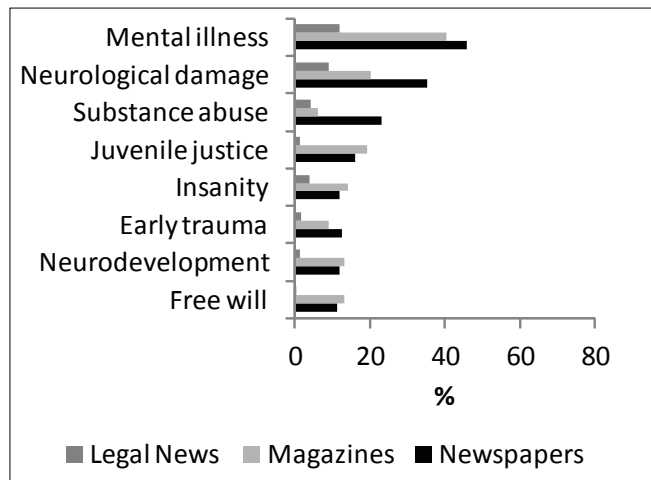


Figure 3B.

Figure 3. Themes in articles at the intersection of law and neuroscience. A. Incidence of occurrence of main themes in each type of print media. Values are expressed as percentages of articles with a mention of a theme in a given type of media. B. Incidence of occurrence of criminal responsibility subthemes in each type of print media. Values are expressed as percentages of articles with a mention of a subtheme in a given type of media.

We examined the distribution of the responsibility theme and the mental illness subtheme over time given the prevalence of these subthemes in the data set. We found that the increase in articles at

the intersection of law and neuroscience with a mention of either responsibility or mental illness mirrors that of the total number of articles, and tripled in number per year on average between the first and second halves of the study period (Figure 4). A Spearman correlation analysis confirms that there is a significant time trend for both these themes (responsibility:  $p=0.002$ , mental illness:  $p=0.003$ ). To determine whether there is an increase over time in the articles with a mention of responsibility or mental illness over time, we fit a Poisson model for regression using time as a covariate. This test is appropriate particularly when the data consists of simple counts, as is the case here. On average, there was a significant increase in articles with a mention of criminal responsibility per year (1.32 articles per year,  $p<0.001$ ) as well as in articles with a mention of mental illness (1.36 articles per year,  $p<0.001$ ).

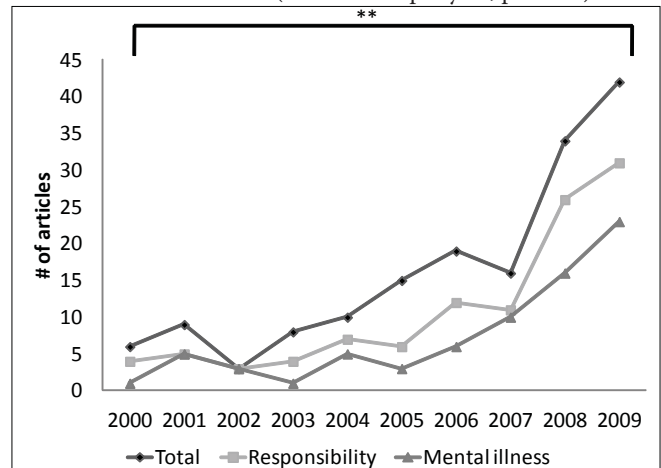


Figure 4. Articles with a mention of responsibility or mental illness over the years. Number of articles per year with a mention of either responsibility (squares) or mental illness (triangles) for three categories of print media. (\*\*  $p=0.002$  mental illness,  $p=0.003$  responsibility)

To specifically examine the subtheme of mental illness at the intersection of law and neuroscience, we analyzed the way that mental illness is described in newspaper articles containing that theme ( $N=74$ , Figure 5). We chose to focus on newspapers as this type of print media had the highest number of instances and incidence of references to mental illness. We found that articles mention mental illness in one of two contexts: 1) when referring to a group of people ( $N=30$ ) (e.g., “mentally ill inmates”) or 2)

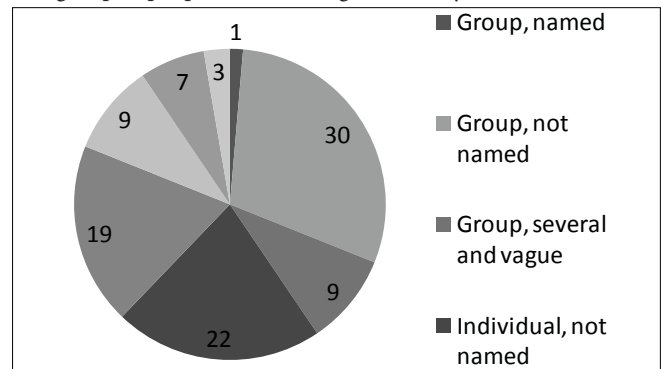


Figure 5. Distribution of types of descriptors used for mental illness. Distribution of the types of descriptors for mental illness when referring to a group of people (categories starting with “group”) or to a single individual (categories starting with “individual”) in our newspapers articles sample.

when referring to a single individual (N=44). For articles referring to a group of people (N=30), the majority (N=22, 73%) failed to name a specific mental illness. For the remainder of articles that refer to a group of people, 23% (N=7) named several types of mental illness in a loosely defined way (e.g., “veterans suffer from mental health problems or post-traumatic stress disorder”). Only one (3%) named a specific mental illness (psychopathy). Articles that refer to a single individual (N=44) either did not name a specific mental illness (N=16, 36%) or mentioned several mental illnesses vaguely (N=14, 32%) (e.g., “[the person has] severe mental illness, is psychotic, delusional and paranoid and suffers from schizophrenia”). Descriptions of mental illness for an individual could also be solely vague (N=5, 11%) (e.g., “a history of anxiety”) or could be detailed but include several different illnesses (N=4, 5%) (e.g., “[the person suffered from] several mental illnesses in the form of (...) schizophrenia and post-partum depression). In articles that referred to individuals, specific mental illnesses were named in 16% of articles (N=7). All told, mental illness was differentiated in only 10% of all articles with a mention of mental illness (N=8). Qualitative examples of these data are provided in Table 1.

*Qualitative features of the data set:* To enrich the quantitative data, we also identified qualitative features of our sample. We focused on criminal responsibility, as it was both a central theme and one that occurred most frequently in our sample. As uncovered in our quantitative data, the concept of mental illness is closely tied to criminal responsibility. However, opinions differ as to the nature of mental illnesses. On the one hand, some view mental illnesses as organic brain diseases:

*“Research in the last decade proves that mental illnesses are diagnosable disorders of the brain.”*

[The Washington Times, December 9 2001]

To support this view, mental illnesses are sometimes compared with other diseases:

*“Today we know that mental illness and addiction is a disease of the brain [...] The brain is not working correctly, just like the body doesn't work correctly when someone has diabetes. If we locked up people with diabetes there would be a public outcry.”*

[The Daily Oklahoman, January 16 2009]

On the other hand, some doubt the legitimacy of the mental illness label in the context of law:

*“The phenomena we label as mental illnesses are not brain diseases, and everyone knows it.”*

[The Washington Times, December 9 2001]

We found that news articles rely on neurobiological explanations (e.g., mental illness, but also brain damage) for criminal behavior, as illustrated by the following headline for an article on psychopathy:

*“Scientists search for the seat of evil: A kink in the brain may cut off remorse.”*

[USA today, May 10 2001].

Type of Descriptor	Example	Reference
Group, named	Some of the most dangerous criminals, and those likely to be repeat offenders upon release from incarceration, are those classified as psychopaths -- about 15 percent to 20 percent of the inmate population [...].	Albuquerque Journal October 5 2008
Group, not named	Brain science could improve lie-detection and influence the judging and sentencing of juveniles and the mentally ill.	St. Louis Post October 9 2007
Group, several and vague	In some cases, these veterans become involved with the criminal justice system due to their actions, which are directly attributable to post traumatic stress disorder, traumatic brain injury or some other factor related to combat experience [...].	The Oregonian February 17 2010
Individual, not named	In June, the Supreme Court upheld a narrow Arizona test for legal insanity, which asked simply whether mental disorder prevented the defendant from knowing right from wrong.	The New York Times July 20 2006
Individual, several and vague	His diagnosis includes schizophrenia, depressive and delusional disorders, alcohol dependency and “personality disorder due to intracranial injury [...].	Standard-Examiner September 30 2009
Individual, named	Mr. Tarloff’s family has said he has a history of schizophrenia, going back to young adulthood.	The New York Times February 20 2008
Individual, vague	If they win the argument, Braunstein could walk free, despite his terrifying - and admitted - mental problems, and despite a state law requiring hospitalization of people acquitted by reason of insanity.	Daily News May 7 2007
Individual, several	A psychologist, Laura Geiger, said Morris also suffered from dementia, major depression and attention deficit hyperactivity disorder.	The Fresno Bee July 8 2008

Table 1. Qualitative examples of the types of descriptors used for mental illness



Journalists also quoted legal proceedings that suggest that neurobiological phenomena can lead to crime:

*“Defense attorneys have not disputed that Quintero shot Johnson, but said brain damage caused him to imagine a dangerous threat, forcing him to take “unreasonable” actions.” [Houston Chronicle, May 2 2008].*

These quotes sometimes crossed the line from suggestion to certainty:

*“A prominent neurologist testified that, if it were not for the [brain] injury, Karl Roberts could not have committed this crime.”*

[Financial Times, January 7 2004].

Further, some statements about the neurobiological basis for criminal behavior were applied in a very broad manner:

*“No one suggests that (...) brain damage makes a murderer, but Dr. Lewis says that (...) almost every killer is a damaged person.”*

[The New York Times, July 21 2001].

## Discussion

Content analysis of US print coverage at the intersection of neuroscience and law provides new insights into the media discourse on topical issues linking advances in the field of neuroscience, criminal behavior and mental illness. Our results show that: 1) there has been an increase in the reporting at the intersection of neuroscience and law over the last decade; 2) the content driving the reporting of neuroscience and law depends on the type of publication; 3) the themes of mental illness and neurological damage are ubiquitously at the center of discussions of responsibility; and, 4) the nature of mental illnesses, other than their association to brain damage, is ill-defined.

We appreciate the limitations of this study and their impact on our findings. The sample is limited to articles published in the USA in the past ten years. While our results on the portrayal of mental illness in the context of criminal responsibility echoes those presented in an overview of international studies (Francis, Pirkis, Dunt, & Blood, 2001), further work will be required to investigate how geographic, regulatory and cultural differences impact research news coverage. We also analyzed only content that is available to readers but we do not know how the audience of the various publications understand this content. Therefore, our data is only a proxy measure of what the public may actually receive or perceive. Further studies will be necessary to investigate the understanding and uptake of the concepts uncovered in the present analysis by the public.

### *Visibility of neurobiological explanations for criminal behavior*

In the recent past, the field of behavioral genetics has had a tremendous impact on the concept of free will and criminal responsibility, suggesting that genetic explanations would diminish individual responsibility for action (Alper, 1998). The debate

now continues with new evidence from neuroscience. Initially, neurochemical models of aggression led to debates on whether violent criminal offenders are responsible for their conduct if it is the result of deterministic processes in the brain (Siegel & Douard, 2010). New insights from neuroimaging and cognitive neuroscience hold the promise of an even greater understanding of the biological causes of criminal behavior (Eastman & Campbell, 2006) and further fuel the responsibility debate among philosophers, legal scholars and neuroscientists. These developments are expected to have a transformative effect on criminal law and several models are emerging as to how this shift will take shape (Chorvat & K. McCabe, 2004; Greene & Cohen, 2004; Reider, 1998; Roskies, 2006).

How does a public that is increasingly and routinely exposed to neurobiological explanations for criminal behavior in the media react to neurobiological types of defenses? There has been increasing interest in the study of the impact of neuroimaging testimony (Dumit, 1999; D. P. McCabe & Castel, 2008; Morse, 2004). In one case, Gurley and Marcus (Gurley & Marcus, 2008) found that introducing brain scans and showing evidence that a defendant suffers brain damage increases the probability that mock jurors would find the defendant not guilty by reason of insanity (Gurley & Marcus, 2008). Taken together, these data solidify the link between exposure to biological explanations for criminal behavior and attitudes about responsibility. The results we report here uncover a rising emphasis on issues surrounding responsibility in the widely accessible media and highlight the need for further investigation of the impact of the media on attitudes about responsibility and the societal implications of these attitudes.

### *Mental illness and violence in popular media*

The news media has been shown to frame a variety of topics ranging from mental illness (Paterson, 2006) to genetics (Petersen, 2001), imposing a schema of interpretation surrounding these topics that may impact how individuals understand and respond to different issues. The framing aspect of media is critical in creating public perceptions of the phenomena it touches. The stereotype of mental illness specifically comprises an aspect of dangerousness (Hayward & Bright, 1997) and the public perception that mentally ill people are violent and dangerous is thus partly created through media exposure. Our data suggest a strong link between mental illness and criminal behavior in US media, an effect also seen previously in an international study (Francis et al., 2001). These representations are thought to contribute to the promulgation of stigmatizing messages about mental illness through a variety of mechanisms including choice of vocabulary and framing of issues (Carpiniello, Girau, & Orrù, 2007; Clement & Foster, 2008; Francis et al., 2001). Results in the present study of imprecise language for mental illnesses are consistent with these previous reports, and place the issue of stigmatizing mental illness in the context of the broad reporting at the intersection of law and neuroscience.

## Conclusion

The growing visibility of possible neurobiological explanations of responsibility that challenges, at least to some extent, notions of capacity, autonomy and free will, may fundamentally change the

way that the courts and the public think about criminal behavior, punishment and policy. Furthermore, the imprecise depiction of mental illness and the implicit connection between mental illness and criminal behavior may contribute to stigma against people living with mental illness. Overall, the data presented here support the imminent need to bring journalists into active dialogue with neuroscientists and legal scholars and are a call for evidence-based neuroscience communication programs that reach this diverse range of stakeholders.

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