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# Judges' perceptions of expert reports: The effect of neuroscience evidence

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ABSTRACT

This article explores the impact of neuroscience evidence on how expert reports are perceived and their effects on the decisions made by trial judges. Experimental psychology has demonstrated a number of cognitive effects arising from exposure to neuroimaging data which may bias judgments and lead to (mis)interpretations that can affect decisions.

We conducted a study on a sample of 62 Swiss and French judges in order to determine whether their perceptions of the credibility, quality and scientific basis of a psychiatric evaluation of a criminal defendant vary according to whether or not the evaluation includes neuroscientific data. Quantitative analyses were conducted in order to evaluate significant differences between the two conditions (one-way analyses of variance) and moderation and conditional analyses to examine whether the participants' sex and length of professional experience moderated the effect of the conditions. Terminological and thematic analyses were carried out on open questions.

Quantitative and qualitative results suggest that the presence of neuroscience data in an expert report affects judges' perceptions of the quality, credibility, and scientificity (reliability, objectivity, scientific basis) of the report, and the persuasiveness of the evidence it provided. Moreover, this phenomenon was stronger in more experienced judges than in less experienced judges.

## 1. Introduction

The inclusion of neuroscience evidence in psychiatric assessments of criminal defendants has aroused great interest(Aggarwal, 2009; Greely, 2012; Looney, 2009; Sandys, Pruss, & Walsh, 2009), but also a certain amount of reserve and considerable debate among scholars, lawyers and forensic practitioners(Kulynych, 1997; Larrieu, 2012; Oullier & Basso, 2012; Roberts, 2006). Neuroscience evidence was first introduced in the 1970s in the United States. Since then, its use has increased substantially in both the United States and Europe, especially during the last ten years (as the science has advanced). In 2011, France became the first country to introduce specific legislation covering the use of neuroimaging data in expert reports, via a bill modifying the country's laws on bioethics (Article 16-14 of the Civil Code, created by Act n2011-814 of July 7, 2011).

For some authors, neuroscientific discoveries offer the possibility of providing the courts with more reliable and more objective evidence, thereby reducing the potential for error associated with traditional psychiatric/psychological evidence, which has been frequently criticized in recent years for being subjective, unreliable and lacking in scientific rigour (Byk, 2012; Lamparello, 2010; Ouiller, 2012). Neuroscience evidence, produced by techniques such as structural and functional neuroimaging, is most commonly used during trials, often by the defense, to demonstrate and "objectivize" psychopathological or neurobiological disorders that may be linked to the violent behavior of which the defendant is accused(Gkotsi, Gasser, & Moulin, 2018). Although advances in neuroscientific research are likely to greatly improve understanding of people and people's behavior, the use of such

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data in criminal trials raises numerous scientific, epistemological, technical, and ethical issues(Gkotsi & Gasser, 2016; Oullier & Basso, 2012; Pignatel & Oullier, 2014). One such issue is the impact of neuroscience evidence on how expert reports are perceived and their effects on the decisions made by trial judges.

Neuroimaging data has great persuasive power, which raises the question of how such data influence judges' perceptions of expert reports (Oullier & Sauneron, 2009; Pignatel & Oullier, 2014), most notably in terms of whether neuroscience evidence is perceived as more scientific than other types of evidence (Munro & Munro, 2015). Neuroscience evidence, like all forms of scientific data presented during trials, may be considered as a "*scientific truth*" whose validity is attested by the highly technical process involved in obtaining it, and therefore accorded greater value (Larrieu, 2012; Roskies, 2006). Even though the inquisitional system (the most common system in Europe) allows judges to assess freely the value of the evidence presented, the latter generally tend to give more weight to science-based information (Larrieu, 2012; V. Moulin & Palaric, 2013; Oullier & Sauneron, 2009). Experimental psychology has demonstrated a number of cognitive effects arising from exposure to neuroscientific explanations and/or neuroimaging data and which may bias judgments and lead to (mis)interpretations that can affect decisions.

Several studies have investigated perceptions of neuroscience data and their impact, especially concerning evaluations of the "quality" of a scientific explanation or argument (Weisberg, Keil, Goodstein, Rawson, & Gray, 2008), experimental study showed that readers (who were not neuroscience specialists) evaluate an argument as being of high quality when it contains this type of information, even when the explanation has flaws and/or when the data do not provide relevant information. Conversely, readers are more likely to recognize weaknesses when neuroscience data are not included. Hence, neuroscience data appears to make explanations more satisfactory, most notably by masking their shortcomings. A variety of explanations for this phenomenon have been suggested. One such explanation is the tendency for people to view the so-called "soft" sciences, such as the social sciences and psychiatry, – as less reliable, less valid, and less rigorous than "hard" sciences, such as physics and biology (Munro & Munro, 2015; Simonton, 2009). Hence, when arguments incorporate neuroscience data, rather than being based on psychological/psychiatric analyses alone, they are judged to be of higher quality and more valid, and participants express a greater degree of agreement with the expert on the pathology described (Munro & Munro, 2015). The reasons for this are related to the fact that explanations containing technical language are perceived as more scientific, even when they are not (Munro & Munro, 2015).

Another effect is the result of a natural tendency to prefer simple, even reductionist, explanations for complex phenomena (Crommelinck, 1995). Neuroscientific explanations are based on concrete images of the brain, rather than non-observable, abstract concepts, as is the case for psychological explanations, and this may contribute largely to their appeal (Gurley & Marcus, 2008; McCabe & Castel, 2008) (Henson, 2005). Because images of the brain provide a physical basis for "revealing" abstract cognitive processes, they could have great persuasive power and could therefore be likely to impact evaluations of an argument's credibility. However, research on this matter has evolved in the light of new data: recent meta-analyses do not confirm that brain images can affect jurors' judgments (Schweitzer et al., 2011), however neuroscience evidence was found to be more persuasive than psychological evidence. The disappearance of the effect of neuro-images in the jurors' perception could be attributed to the fact that people have gotten more used to neuroscience evidence (Schweitzer et al., 2011).

These effects are not specific to neurosciences; they are also valid for other sciences and thereby show the wider importance of examining the influence of scientific data on judges' decisions. The particularity of neuroscience data is that they are capable of generating them and are therefore likely to have particularly great persuasive power (Weisberg et al., 2008). This research suggests that including neuroscience evidence in an expert report may impact the way the report is assessed by non-specialists, such as judges, whose work requires them to take into account such reports.

Very few studies have compared professional judges' perceptions of evidence including neuroscientific data versus "traditional" expert reports [most studies include samples of participants with no training in or experience of the justice system (mock jurors) or jurors (Schweitzer et al., 2011)], and those to have done so have been conducted in countries with an adversarial system (relevant literature does not include any studies carried out in European countries with inquisitorial systems).

In this light, we decided to carry out a study on a sample of Swiss and French judges in order to determine whether their perceptions of the credibility, quality and scientific basis of a psychiatric evaluation of a criminal defendant can vary according to whether or not this evaluation includes neuroscientific data (a written description of a structural neuroimaging MRI scan).

## 2. Procedure and method

### 2.1. Study sample

We asked 100 judges (50 Swiss and 50 French), practicing within inquisitorial justice systems, to take part in the study. We received responses from 62 of these judges (21 Swiss judges and 41 French judges).

#### 2.1.1. Recruitment of the judges

We recruited Swiss judges via letters sent to all the public prosecutors and court presidents in the country's French-speaking cantons, and then to every magistrate. French judges were recruited from judges attending continuing training courses in Paris. Participation in the study was entirely voluntary and we guaranteed that all data collected would be anonymous.

#### 2.1.2. Criteria for inclusion in the sample

Our sample consisted of judges who use expert reports during trials (prosecutors, examining judges, and trial judges), without taking into account characteristics such as sex, experience, or geographical location.

### 2.2. Practical case: expert reports

The research was presented orally, and then judges who so wished could participate. A document was given to the judges in the form of a clinical case followed by questions (questionnaire). The document included handover instructions (reading the clinical case and answering questions). It then collected sociodemographic information and information on the functions performed and the number of years of experience. After reading the clinical case, the judges were invited to answer the open questions (text) and closed questions (Likert scale) directly on the document. They had the time they needed to read and answer the questions (no time limit). They then had to file the document with someone who collected the questionnaires.

In order to evaluate the effects of neuroscientific evidence on judges' assessments of expert reports and on the decisions they take, we asked the judges to read one of two expert reports describing a clinical case study. One of the reports included neuroscientific data while the other report did not. The reports we used were inspired by real cases so we could provide the judges with a realistic, concrete situation (Hughes, 1998). The report was written like a traditional expert report. A traditional report contains separate parts: (1) the offense mentioned in the criminal report based on the review of records; (2) anamnestic data (based on observation, clinical interview psychological tests, complementary sources); (3) the psychological status and psychiatric diagnosis based on observation, clinical interview, psychological tests and complementary sources); (4) the offense as presented by the subject; (5)