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The Influence of fMRI Lie Detection Evidence on Juror Decision-Making

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In the current study, we report on an experiment examining whether functional magnetic resonance imaging (fMRI) lie detection evidence would influence potential jurors' assessment of guilt in a criminal trial. Potential jurors ($N = 330$) read a vignette summarizing a trial, with some versions of the vignette including lie detection evidence indicating that the defendant was lying about having committed the crime. Lie detector evidence was based on evidence from the polygraph, fMRI (functional brain imaging), or thermal facial imaging. Results showed that fMRI lie detection evidence led to more guilty verdicts than lie detection evidence based on polygraph evidence, thermal facial imaging, or a control condition that did not include lie detection evidence. However, when the validity of the fMRI lie detection evidence was called into question on cross-examination, guilty verdicts were reduced to the level of the control condition. These results provide important information about the influence of lie detection evidence in legal settings. Copyright © 2011 John Wiley & Sons, Ltd.

Lie detection technologies have traditionally been excluded as evidence in the court system. While law enforcement uses lie detection technology on a voluntary basis during the investigative stage, lie detection technologies have not been proven sufficiently scientifically valid to be admitted as evidence. One of the most well-known methods for detecting lies in legal settings is the polygraph, which measures physiological changes in the body during questioning. Estimates of the accuracy of the polygraph for determining whether or not someone is lying vary widely (Honts & Amato, 2007; Pollina, Dollins, Senter, Krapohl, & Ryan, 2004), and the polygraph has been criticized because simple countermeasures substantially reduce accuracy (Honts, Hodes, & Raskin, 1985). Some have suggested that polygraph evidence may be accepted as credible by jurors despite its unreliability, because the technology appears scientific (*Regina v. Phillion*, 1973; *U.S. v. Alexander*, 1975). However, prior work indicates that polygraph evidence does not increase the proportion of potential jurors' guilty verdicts (Myers, Latter, &

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Abdollahi-Arena, 2006; Myers, Rosol, & Boelter, 2003; Spanos, Myers, DuBreuil, & Pawlak, 1992).[1]

The criteria for admitting testimony and evidence into court proceedings from technologies used for detecting deception have differed over the last several decades. For example, in *Frye v. The United States* (1923), a rudimentary version of polygraph technology (based on changes in blood pressure) was ruled inadmissible because the court concluded that it had not gained widespread acceptance in the scientific community, and thus might bias the jury panel's fact-finding role. More recently the rules of evidence established by the "Daubert test" (*Daubert v. Dow Pharmaceuticals*, 1993) have provided the criteria to determine whether scientific evidence, including evidence of lie detection, is admissible. The criteria established by the Daubert test include determining the reliability of the method used for collecting scientific evidence, peer review of said evidence, and acceptance of said evidence in the scientific community. Although most states (whose rules of evidence may differ in some respects from the Federal Rules of Evidence) bar the use of polygraph tests entirely, in many states judges now act as gatekeepers with respect to whether polygraph evidence is admissible, using the Daubert rule and/or the Rules of Evidence as guidelines. These criteria are general criteria for all expert testimony and thus are not only relevant to the admissibility of polygraph evidence, but also to the introduction of lie detection evidence based on other technologies, which is the focus of the current study.

FUNCTIONAL MAGNETIC RESONANCE IMAGING (fMRI) AS A LIE DETECTION TECHNOLOGY

The basic assumption underlying the use of fMRI technology for lie detection is that brain areas associated with effort or conflict are activated when people are lying, and these areas can be pinpointed in an individual brain. Recently, research examining the feasibility of fMRI evidence of lie detection has been reported (Kozel et al., 2005; Langleben et al., 2002, 2005), and has been touted by some as being more accurate than the polygraph. For example, "No Lie MRI", a company that markets and sells fMRI lie detection tests, proclaims that fMRI lie detection technology provides "the first and only direct measure of truth verification and lie detection in human history!"[2] Although some consider fMRI a promising technology for lie detection (Feigenson, 2006; Haynes, 2008; Simpson, 2008), many others consider the current technology unreliable (Ford, 2006; Mandavilli, 2006; Merikangas, 2008; Sip, Roepstorff, McGregor, & Frith, 2008). For example, studies providing empirical support for the use of fMRI as a lie detector have not involved imaging people during actual criminal investigations, limiting their generalizability. Rather, most empirical studies to date have instructed presumed non-criminals to lie about trivial matters in a controlled setting (Kozel et al., 2005; Langleben et al., 2002, 2005; Spence, 2004),

[1] Cavoukian and Heslegrave (1980) found that polygraph evidence did influence guilty verdicts. However, that study did not examine polygraph evidence indicating the defendant was guilty, but rather, examined polygraph evidence that indicated the defendant was not guilty. Because more recent studies, including the current one, examined conditions indicating the defendant was guilty, and because the Cavoukian and Heslegrave study was conducted over 30 years ago, it is less relevant to the conditions in the current study.
[2] Retrieved at http://noliemri.com/ on June 1, 2010.

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and some have questioned whether lying, when asked to do so, is truly lying at all (Ford, 2006; Spence, 2004; Sip et al., 2008). Moreover, it is unclear whether the structure or function of an individual brain can be compared with data from studies that combine data across participants (Morse, 2006; Sinnott-Armstrong, Roskies, Murphy, & Brown, 2008). A number of other methodological limitations, beyond the scope of this paper, are involved in collecting valid fMRI data (e.g., participants must remain immobile during scanning), and detract from its usefulness as a lie detection technology (cf. Morse, 2006). Thus, although fMRI lie detection technology is available, many in the scientific community believe its application in criminal trials would be premature (e.g., Greely & Illes, 2007).

Despite the scientific controversy over the use of fMRI evidence in legal settings, criminal courts may consider the admission of this evidence during trials (Madrigal, 2009). If, or perhaps when, fMRI evidence is allowed in criminal trials, there will be many issues to address regarding the potential influence of that evidence on jurors' decisions. The purpose of the current study is to provide the first empirical investigation of the influence of fMRI evidence on potential jurors' decision-making. Such research is needed in order to determine if fMRI evidence is a persuasive form of evidence that can influence jurors, and to determine if this evidence would be more or less influential than other lie detection evidence (e.g., polygraph evidence).

THE INFLUENCE OF BRAIN-RELATED EVIDENCE ON DECISION-MAKING

Prior work examining the influence of cognitive neuroscience data on decision-making suggests that brain imaging evidence might have a particularly persuasive effect on juror decision-making. For example, Weisberg, Keil, Goodstein, Rawson, and Gray (2008) found that poor explanations for psychological phenomena were judged as more valid when irrelevant brain-related research was presented to support the explanation. Similarly, McCabe and Castel (2008) reported that participants were more likely to judge the scientific reasoning of cognitive neuroscience studies as valid when brain images were presented compared with presentation of other images. Thus, these studies indicate that evidence derived from neuroimaging can have a powerful effect on participants' decision-making under some circumstances. In the current study, we investigated whether this influence would extend to decisions regarding a defendant's guilt in a criminal trial, an issue that has important applications.

No prior research has investigated whether fMRI evidence influences jurors' perceptions of a defendant's guilt or lack of guilt. To the best of our knowledge, only one prior study has examined the influence of brain imaging evidence on juror decision-making. Specifically, Gurley and Marcus (2008) reported that vignettes that included text indicating that brain lesions were evident on images derived from *structural* MRI (which provides detailed anatomical images of the brain at rest) increased decisions of not guilty by reason of insanity. To the extent that structural MRI can provide useful, valid data regarding potential brain damage (another issue of rigorous debate; see Morse, 2006), Gurley and Marcus' data are potentially relevant to the mitigating influence of brain damage on a defendant's culpability. More importantly, these data indicate that brain imaging data can influence juror decisions.

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While the Gurley and Marcus (2008) study represents an important first step in investigating the impact of brain imaging on juror decisions, a number of important issues regarding the impact of brain imaging technology on juror decision-making remain unresolved. In particular, the impact of fMRI has yet to be examined in the context of lie detection. Whereas structural MRI provides data relating to the anatomy of the brain, fMRI provides *in vivo* evidence of brain activity during cognitive processing. To date, the interpretation of fMRI has been very controversial,[3] particularly relating to its use in legal and other applied settings.

THE CURRENT STUDY

In the current study, we addressed the issue of whether lie detection evidence influences juror decisions based on the technology that was used to assess lie detection. We were specifically interested in whether fMRI evidence would be more influential than traditional methods (i.e., the polygraph), or another novel physiological approach to lie detection (i.e., thermal imaging). Thermal imaging is a lie detection technology that involves imaging the level of heat in a person's face, with more heat indicating deception (Ford, 2006; Moenssens, 2002). Like fMRI lie detection, thermal imaging technology is novel and involves imaging physiological responses, but it is not directly related to brain activity. Thus, including the thermal imaging condition provides a comparison condition for the fMRI condition that also images physiological responses, but thermal imaging does not directly link behavior to brain activity. Similarly, the polygraph measures a person's physiological responses during questioning but, like thermal imaging, is not directly related to brain activity.

Previous research suggests that potential jurors are often unable to detect flaws in scientific research (McAuliff, Kovera, & Nunez, 2009). Although the current study does not specifically address whether the technology used is flawed *per se*, as reviewed previously, there are many limitations to fMRI lie detection that may or may not be evident to potential jurors. Thus, the focus of the current study was on whether potential jurors would view a novel lie detection technology (fMRI) as more valid than more traditional forms of lie detection (i.e., the polygraph) or another novel technology that was unrelated to brain activity (i.e., thermal imaging).

Another issue addressed in the current study was whether questioning the validity of fMRI lie detection would have less influence on juror decisions. If fMRI lie detection is more influential than other forms of lie detection, the ability of potential jurors to discount that evidence when appropriate is of critical importance. Prior research has demonstrated that expert testimony can be discounted when its validity is called into question (Kovera, McAuliff, & Hebert, 1999), but whether this would occur with fMRI lie detection is unknown. One hypothesis regarding the weight of fMRI evidence is that potential jurors may largely ignore fMRI results when information is introduced that questions its validity. However, as noted previously, prior work (Weisberg et al., 2008; McCabe

[3] We also note that within the scientific community there remains vigorous debate as to how evidence obtained from fMRI should and can be properly analyzed and interpreted with respect to complex behaviors and decisions (see Vul, Harris, Winkielman, & Pashler, 2009, and the accompanying commentaries).

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& Castel, 2008) suggests that brain-related evidence can compromise assessments of the quality of scientific data. Thus, an alternative hypothesis is that fMRI evidence may be influential regardless of whether its validity has been questioned. In the current study, conditions were included that questioned the validity of the fMRI evidence or thermal imaging evidence. This allowed an examination of whether the potential influence of these novel, physiologically based lie detection technologies could be discounted by potential jurors.

To summarize, participants in the current study assessed the guilt (or lack thereof) of a defendant in a criminal trial based on evidence presented in a vignette. All participants (except those in the control group) read evidence suggesting that the suspect was lying, with this evidence based on the polygraph, fMRI, or thermal imaging technology. Based on prior work examining the influence of brain imaging evidence on critical thinking (Weisberg et al., 2008; McCabe & Castel, 2008) we anticipated that potential juror decisions would be influenced to a greater extent by fMRI evidence of lie detection than by other methods of lie detection. We did not expect that polygraph evidence would be particularly influential (cf., Myers et al. 2003, 2006; Spanos et al. 1992). We also predicted that despite thermal imaging being a novel lie detection technology based on imaging, like fMRI, it would not be as influential as fMRI evidence because it did not provide evidence of brain functioning. Thus, we predicted that the influence of thermal imaging evidence would be more similar to the influence of polygraph evidence than the influence of fMRI evidence.

In addition to including lie detection evidence conditions, we also included conditions in which the validity of the fMRI or thermal imaging lie detection evidence was questioned. This was done by including text describing the defense cross-examining the expert witness for the prosecution, with the expert witness indicating that the lie detection evidence was not entirely reliable (see the "Method" section for details; cf., Kovera et al., 1999). We also asked participants which evidence (i.e., the particular point in the vignette) was most influential in making their decision. Although participants' subjective impressions of which information had the greatest influence on their judgments may be somewhat limited, their impressions of which information is most influential can provide insights into their attributions regarding the strength of different types of evidence. Note that when the validity of some particular evidence is called into question this will not necessarily affect the proportion of guilty verdicts, even if that evidence is given less weight. That is, potential jurors who might use lie detection evidence may use other evidence as a basis for their verdict and thus render guilty verdicts with the same frequency.

METHOD

Participants and Design

Three-hundred and thirty undergraduates at Colorado State University undergraduates participated in the experiment for course credit. The subject pool was primarily freshman and sophomore students between the ages of 18 and 22 years (average age = 19.2), was 58% female, 86% White, and 97% of participants were native English speakers. Participants were randomly assigned to one of six different evidence

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conditions: control, polygraph, fMRI, thermal imaging (TI), fMRI: validity questioned, TI: validity questioned.

Materials

The vignette used in the current study was a modified version of the vignette created by Kassin and Sommers (1997). The vignette describes a case in which a defendant was accused of killing his estranged wife and her lover. The vignette was created such that "the prosecutor's evidence was circumstantial, incomplete, and ambiguous" (Kassin & Sommers, 1997, p. 1048), and included 23 discrete summary points. Thus, the case was created with the intent of providing reasonable doubt regarding the defendant's guilt. In the truncated version of the vignette we used, there were 16 or 17 discrete "points of evidence", depending on the evidence condition in the vignette, each of which was numbered. The vignette included: (a) opening statements by the prosecutor and defense; (b) summaries of the testimony and cross-examination of a prosecution witness and a defense witness; (c) summaries of the testimony and cross-examination of a police officer; (d) testimony by the lie detection expert (except in the control condition); (e) cross-examination of the lie detection expert (in the "validity questioned" conditions); (f) closing arguments by the prosecutor and defense: and (g) the judge's instructions to the jurors regarding burden of proof.

The vignette was printed on the front and back of a single page, with two questions following the end of the vignette. The first question asked participants, "If you were a juror in the above trial, would you find the defendant guilty or not guilty?", which was followed by two boxes labeled either "guilty" or "not guilty". Participants indicated their decision by checking one of these boxes. This question was followed by another asking, "What evidence was most influential in making your decision? Please indicate this by writing down the number of the ONE point you found most compelling", which was followed by a blank space in which to write in the response.

The experimental manipulation involved differences in point 8, or points 8 and 9, depending on the evidence condition. In the control condition, point 8 simply stated that the second prosecution witness, Dr. Ronald Tinsworth, could not testify due to a family emergency. In the Polygraph condition, point 8 stated that Dr. Tinsworth testified that, "there was increased physiological activity when Givens denied killing his wife and neighbor, as compared to when he truthfully answered questions…", which was consistent with the idea that Givens was lying. In the fMRI condition, point 8 stated that Dr. Tinsworth testified that, "there was increased activation of frontal brain areas when Givens [the defendant] denied killing his wife and neighbor, as compared to when he truthfully answered questions…", which was consistent with the idea that Givens was lying. In the TI condition, point 8 stated that Dr. Tinsworth testified that, "the temperature in Givens's face increased when Givens denied killing his wife and neighbor, as compared to when he truthfully answered questions…", which was consistent with the idea that Givens was lying. In the fMRI: validity questioned condition, point 8 was the same as the fMRI condition, but point 9 stated that Dr. Tinsworth "admitted that functional magnetic resonance imaging (fMRI) is not always accurate and conclusions drawn from fMRI have been wrong in several cases", and that it is a controversial method. The TI: validity questioned condition included the same point 8 as the TI condition, but point 9 stated that Dr. Tinsworth, "admitted that thermal imaging (TI) is not

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always accurate and conclusions drawn from TI have been wrong in several cases", and that it is a controversial method.[4]

RESULTS

Guilty Verdicts

Figure 1 shows the proportion of "guilty" verdicts for each "evidence condition". As is evident in the figure, participants in the fMRI condition gave more guilty verdicts than any of the other conditions. By contrast, these other conditions rendered a similar percentage of guilty verdicts. A Kruskal–Wallis test with evidence condition as a between-subjects variable confirmed that there was a significant effect of evidence condition, χ^2 (5, $N = 330$) = 11.65, $p < 0.05$. Comparisons of each of the conditions indicated that there were reliably more guilty verdicts in the fMRI condition ($M = 0.76$; SD = 0.43) than in the control condition ($M = 0.56$; SD = 0.50), $\chi^2(1, N = 110) = 4.88$, $p < 0.03$, the polygraph condition ($M = 0.47$; SD = 0.50), $\chi^2(1, N = 110) = 9.77$, $p < 0.01$, the fMRI: validity questioned condition ($M = 0.53$; SD = 0.50), $\chi^2(1, N = 110) = 6.65$, $p < 0.02$, the TI condition ($M = 0.53$; SD = 0.50), $\chi^2(1, N = 110) = 6.65$, $p < 0.02$, and the TI: validity questioned condition ($M = 0.53$; SD = 0.50), $\chi^2(1, N = 110) = 6.65$, $p < 0.02$. None of the other between-group comparisons were significant (all χ^2 values < 1). Thus, guilty verdicts were significantly more likely for fMRI evidence, but this evidence was less influential when its validity was questioned.

Reported Bases for Guilty Verdicts

We also examined the specific points of evidence that were reported as most influential by participants who reported a guilty verdict. Our primary interest was in the frequency with which participants cited lie detection evidence (described in the Method section) as a basis for their guilty verdicts (see Table 1). As noted previously, potential jurors' may not be consciously aware of the particular issue that most influenced their guilty verdict, but these data provide an assessment of the salience of the lie detection evidence from a participant's perspective. Given that the control condition did not include any evidence of lying, our analyses of lie detection evidence focused only on the remaining conditions. A Kruskal–Wallis test indicated that the proportion of participants reporting the lie detection evidence as a basis for guilty verdicts differed across conditions, $\chi^2(4, N = 155) = 11.58$, $p < 0.03$. Mann–Whitney U-tests were computed to compare the proportion of the lie detection evidence cited as a basis for guilty verdicts for the fMRI condition in comparison with all other conditions. These follow-up tests did not reveal reliable differences among conditions (Z values ≤ 1.55, p values ≥ 0.12), with one exception. In particular, lie detection evidence was cited as a basis for guilty verdicts reliably more often in the fMRI condition than in the TI: validity questioned condition ($Z = 2.58$, $p < 0.02$).

We note that the other most commonly reported basis for a guilty verdict was what we refer to as the "frustration/knife" evidence (see Table 1). In the vignette it read as

[4] Complete materials are available from the third author (M. G. Rhodes) upon request.

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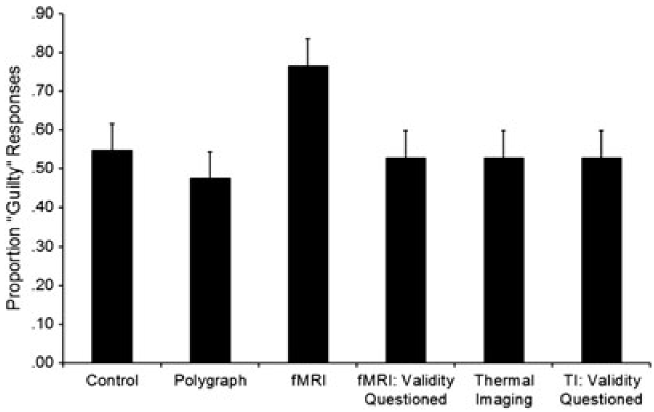

Figure 1. The proportion of “guilty” verdicts for each “evidence condition”. fMRI, functional magnetic resonance imaging; TI, thermal imaging.

Table 1. Number of participants reporting the lie detection evidence as a basis for guilty verdicts. Note that *N* (the number of participants) differs across groups because these data only include those participants who reported a “guilty” verdict

Condition	*N*	Lie detection	Frustration/knife	Other
Control[a]	31	–	13	18
Polygraph	26	6	10	10
Functional magnetic resonance imaing (fMRI)	42	16	7	19
Thermal imaging (TI)	29	13	3	13
fMRI: validity questioned	29	6	7	16
TI: validity questioned	29	3	9	17

[a]In the control condition no lie detection evidence was presented; The “lie detection” points are described in the Method section; the “frustration/knife” point read as follows: “On cross-examination, Guerin [the defendant’s friend and defense witness] admitted that Givens [the defendant] had in the past expressed ‘frustration’ about his wife. He also admitted that he and Givens had hunted together and that Givens owned at least one hunting knife.” The victims had been killed by a hunting knife that was not recovered.

follows: “On cross-examination, Guerin [the defendant’s friend and defense witness] admitted that Givens [the defendant] had in the past expressed “frustration” about his wife. He also admitted that he and Givens had hunted together and that Givens owned at least one hunting knife.” A Kruskal–Wallis test indicated that the proportion of participants reporting the “frustration/knife” evidence as a basis for guilty verdicts differed across conditions, $\chi^2(5, N=186)=12.04$, $p<0.05$. In particular, Mann–Whitney *U*-tests showed that participants in the fMRI condition reported the frustration/knife evidence as a basis for their guilty verdict reliably less often than participants in the control ($Z=2.38$, $p<0.02$) or polygraph ($Z=2.00$, $p<0.05$) conditions. Participants in the TI condition likewise reported the frustration/knife evidence as a basis for their guilty verdict reliably less often than participants in the control ($Z=2.74$, $p<0.01$) or polygraph ($Z=2.43$, $p<0.02$) conditions. No other comparisons yielded reliable differences. In addition, there were no other differences in the proportion of participants reporting other bases for guilty verdicts (p values ≥ 0.31).

Overall, despite similarities in the frequency with which lie detection was reported as the primary basis for guilty verdicts across conditions, the proportion of guilty responses

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was equivalent in all conditions except in the fMRI condition. Thus, although participants reported different points of evidence as having a primary influence on their guilty verdicts across conditions, these differences did not necessarily influence the overall proportion of guilty verdicts.

GENERAL DISCUSSION

The current study investigated the influence of neuroimaging evidence on potential jurors' assessment of guilt in a criminal trial. Results showed that presenting fMRI evidence suggesting the defendant was lying about having committed a crime was more influential than any other evidence condition. Questioning the validity of the fMRI evidence reduced the proportion of guilty verdicts rendered to the level of the control condition that was not presented with any evidence of lying. Thus, fMRI evidence was particularly influential unless its scientific validity was called into question.

Juror Decision-Making and the Influence of fMRI Evidence

What accounts for the impact of fMRI evidence on potential jurors' decisions? One possibility is that it provides an explicit link for potential jurors between biology and behavior. In the same manner that participants find a "not guilty by reason of insanity" defense more compelling if it is accompanied by evidence linking a brain lesion to mental illness (Gurley & Marcus, 2008), potential jurors may likewise consider evidence of lying more compelling if it is accompanied by information indicating greater effort measured "directly" in the brain. It is not the use of technology alone that makes lie detection evidence more salient. For example, the percentage of guilty verdicts did not differ from the control condition when evidence of lying was supported by thermal imaging evidence. Potential jurors may believe that a more tenuous link exists between the temperature of the face and behavior in comparison with evidence gleaned from fMRI, and thus are less likely to integrate such information into their decisions. Indeed, when evidence was presented that questioned the link between fMRI evidence and behavior putatively indicative of lying, potential jurors were less likely to render a guilty verdict and reported that the evidence was less likely to influence their decision. Thus, the influence of fMRI evidence may be predicated on jurors' implicit theories about the relationship between behavior and the brain as revealed by fMRI.

Such a conclusion, if true, suggests a need for additional research on fMRI lie detection and juror decision-making, and also has important implications for how potential jurors should regard evidence obtained from fMRI technology. As noted previously, claims suggesting that fMRI provides a highly sensitive method of detecting deception are not supported by a scientific consensus. In addition, data reported in the current study suggest that evidence derived from fMRI may influence potential jurors more so than other evidence of lie detection.

Weighing the Probative Value of fMRI Evidence

The decision regarding the admission of evidence must weigh the probative value of that evidence against its potential prejudicial influence. The issue of whether or not fMRI evidence has substantial probative value is beyond the scope of this paper, but it well

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addressed elsewhere (e.g., Feigenson, 2006; Dressing, Sartorius, & Meyer-Lindenberg, 2008; Sinnott-Armstrong et al., 2008). Some legal decisions have concluded that the admission of brain imaging evidence in a criminal trial would be more prejudicial than probative (see Batts, 2009), though others have suggested that if the technology reaches accuracy rates greater than 90%, its admission is inevitable (Rosen, 2007).

With regard to the potential prejudicial nature of fMRI evidence, the current data provide support for the idea that fMRI evidence could be more influential than other types of evidence, though determining whether that indicates the evidence would lead to unfair prejudice, confusion of the issues, misleading the jury, or needless presentation of cumulative evidence is a complex issue. At the very least, it appears that juries should be informed of the limitations of fMRI evidence. The data from the fMRI: validity questioned condition suggest that providing information regarding the limitations of fMRI evidence reduces the influence of that evidence. Of course, in an actual trial there are other factors that may affect the influence of that evidence (e.g., presentation of brain images, the amount of time between presentation of evidence and juror decisions, deliberation among jurors). Thus, further research should examine the extent to which fMRI evidence may influence juror decisions. The focus of the current study centered on the initial question of whether fMRI evidence can influence juror decisions as compared with polygraph or thermal imaging evidence. In that respect, the current study demonstrated that fMRI evidence can be more influential than these other lie detection technologies, at least under some circumstances.

Limitations of the Current Study

The current study focused on investigating the potential influence of different types of information on juror decisions, but we should note that there are several limitations of the current methodology. First, although our sample comprised potential jurors, like many other studies of this type, the participants were college undergraduates and therefore were not completely representative of an actual jury pool. Second, we examined individual juror decisions, rather than decisions following post-trial deliberations, and juror decisions may differ depending on whether those decisions are deliberated with other potential jurors (Devine, Clayton, Dunford, Seying, & Pryce, 2001). Third, the temporal constraints in the current study were very different than in an actual trial. In the current study the evidence was presented in summary form with very little time between the introduction of the critical evidence, or testimony questioning the validity of that evidence, and the potential jurors' decision regarding guilt. In an actual trial, evidence would be introduced and a juror decision would likely be rendered days or even weeks later. Fourth, the use of a vignette limits the current study because there was no actual testimony viewed by potential jurors, but rather, a summary of the testimony was provided. Finally, the present study examined fMRI lie detection technology in *a criminal trial scenario*, focusing on a violent crime. Thus, these data do not address how this technology would influence jurors' decision-making in other types of proceedings (e.g., tort or divorce proceedings). We hope that such observations will spur continued research on the generality of these findings. For the present, the results of the current study suggest that, even if fMRI technology were adjudged reliable, it may be overly prejudicial, arguing against its admissibility for the same reasons that polygraph evidence is largely held inadmissible today.[5]

[5] We thank an anonymous reviewer for this insight.

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Although the methodology involved in the current study could limit the overall generalizability of the data reported, the primary issue examined in the current study was whether fMRI data had the potential to be particularly influential with respect to potential jurors' decisions regarding the guilt of a defendant. Because courts may consider the admissibility of fMRI evidence during criminal trials (Madrigal, 2009), the current study is an important first step in understanding the potential influence of fMRI evidence in criminal cases.

Concluding Comments

The stakes involved in the search for a reliable lie detection technology are considerable. For example, if a nearly foolproof lie detection technology were available, it would provide a means by which to confirm or disconfirm statements made during criminal investigations. However, prior research using fMRI to detect lying has many limitations and it has yet to be admitted as evidence during a criminal trial. The current research suggests that fMRI evidence of lie detection may be particularly influential compared with other lie detection evidence, although this evidence can be discounted to some extent.

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