
Media Use and Public Perceptions of DNA Evidence

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Abstract

This study uses survey data to examine how various forms of media use are related to public perceptions of DNA evidence, including self-perceived understanding of DNA, perceptions of DNA evidence as reliable, weight attached to DNA evidence (or the absence thereof) in jury decision making, and support for a national DNA databank. The hypotheses build on cultivation theory, priming theory, and research regarding the “CSI effect.” The findings indicate that overall television viewing, crime television viewing, and news media use predict perceptions of DNA evidence. Moreover, a question-order experiment produced evidence that priming thoughts about media can influence such perceptions.

Keywords

media use, public perceptions, DNA evidence, *CSI* effect, priming

The use of DNA evidence in the U.S. criminal justice system has increased dramatically in recent years. Most obviously, forensic DNA testing has been used to solve and try an ever-growing number of criminal cases (Dale, Greenspan, & Orokos, 2006; National Research Council, 1996). As of November 2008, the Combined DNA Index System unit of the U.S. Federal

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Bureau of Investigation had used the National DNA Index to assist in over 79,300 investigations.¹ Forensic DNA testing has also been used to exonerate numerous wrongly convicted individuals, most famously by the Innocence Project (see Connors, Lundregan, Miller, & McEwan, 1996; Scheck, Neufeld, & Dwyer, 2001). As one recent report put it, the "application of DNA technology . . . has revolutionized forensic science" (Dale et al., 2006, p. 1).

Members of the U.S. public, in turn, tend to favor the use of DNA evidence in the criminal justice system. Of the respondents in a 1998 TIME/CNN poll, 66% said that "police should . . . be allowed to collect DNA information from suspected criminals, similar to how they take fingerprints."² Fully 80% of the respondents in a 2000 Democratic Leadership Council survey supported a "national DNA databank with DNA collected from all criminals" (Penn, 2000). Likewise, numerous polls have found large majorities in favor of conducting DNA tests to assess the guilt or innocence of convicted criminals in general and death row inmates in particular.³

Citizens also place a high—and increasing—degree of confidence in DNA evidence. In a 2000 Gallup poll, 20% of the respondents said that DNA evidence is completely reliable, 57% said that it is very reliable, and 20% said that it is somewhat reliable; only 1% said that it is not reliable at all.⁴ In another Gallup poll conducted 5½ years later, the percentage saying that it is completely reliable had increased by seven points (to 27%).⁵ The trend of increasing confidence in DNA evidence appears to extend back into the 1990s: CBS News polling found that the percentage of respondents saying that "tests that scientific experts can do on blood and other material, like DNA tests . . . can prove that a person was present at the place of a crime" increased from 36% in 1995 to 60% less than 3½ years later.⁶ Self-perceived understanding of DNA has increased over time, as well. In 1990, only 22% of the respondents in a National Science Foundation survey said that they had a clear understanding of what DNA means. By 2001, that number had grown to 46%.⁷

For their part, the mass media frequently present information about DNA evidence. To begin with, news coverage of DNA evidence has increased considerably from the early 1990s to the present. Figure 1 illustrates the number of items found in each year from 1990 to 2008 through a Lexis-Nexis search for "DNA evidence" in the full text of items from the *New York Times*, a leading news source in the United States.⁸ In 1990, the search returned only seven items. The level of coverage jumped in 1994 and again in 1995, due in large part to the O. J. Simpson trial. Coverage declined in 1996, but began rising again the following year and continued to increase throughout the rest of the 1990s. There were 90 items in 2000, a year in which Illinois Governor George



Figure 1. Number of *New York Times* items mentioning “DNA Evidence,” 1990-2008

Ryan sparked a national debate over the use of DNA evidence by declaring a moratorium on executions in his state in response to exonerations of death row inmates through the use of such evidence. Over the course of the next 8 years, the number of items reached a high of 103 (in 2002) and was never lower than 56 (in 2008).

Portrayals of DNA evidence also abound on popular entertainment television programs. In 2000, the CBS network premiered *CSI: Crime Scene Investigation*, a prime-time drama that revolves around a team of forensic scientists who frequently use DNA evidence to solve crimes. The show has placed in the top 10 of the prime-time Nielsen ratings in each of its seasons to date; in its current season, its ninth, it is the second-highest rated show on television.⁹ Given the show’s popularity, CBS launched two spin-off programs, *CSI: Miami* (which premiered in 2002) and *CSI: New York* (2004), each of which remains in production. Moreover, the network launched other crime dramas that feature forensic science—most notably, *Without a Trace* (2002), *NCIS* (2003), and *Cold Case* (2003), all of which remain in production. In 2005, the FOX broadcast network debuted *Bones*, a drama featuring a team of crime-solving forensic anthropologists; it, too, remains in production. In the realm of documentary and reality television, true-crime programs such as *Forensic Files* (launched as *Medical Detectives* in 1995 following the O. J. Simpson trial) often portray the use of DNA testing to solve crimes.

Given all of this, it is reasonable—and important—to ask whether media use and perceptions of DNA evidence are related among the public. The present study analyzes original survey data in order to shed new light on this subject. Specifically, it examines how overall television viewing, crime television viewing, newspaper readership, and local television news viewing are related to self-perceived understanding of DNA, perceptions of DNA evidence as reliable, weight attached to DNA evidence (or the absence thereof) in jury decision making, and support for a national DNA databank. It also draws on an experiment in question order to test whether priming thoughts about media shapes these perceptions. The findings extend the growing body of research regarding how media use is related to public perceptions of science and technology. The results also speak to and, ultimately, reorient the recent debate over the so-called “*CSI* effect”—that is, the notion that portrayals of forensic evidence on entertainment television programs shape public perceptions of such evidence, particularly in the context of jury decision making.

Media Use and Public Perceptions of Science and Technology

Initial research into the effects of media use on public perceptions of science and technology drew on cultivation theory, which emphasizes the role of television as a whole (rather than any one program or genre) in shaping viewers’ perceptions of reality (Besley & Shanahan, 2005; Shanahan & Morgan, 1999). Gerbner, Gross, Morgan, and Signorielli (1981, 1985; see also Shanahan & Morgan, 1999) found that heavy viewers expressed more reservations about science and technology than did light viewers. Subsequent research, however, found that overall television viewing can cultivate not only reservations about science and technology but also beliefs in the promise of science and technology (Nisbet et al., 2002). At the same time, television viewing appears to be negatively related to general knowledge about science and technology, which may reflect television’s displacement of learning opportunities (Nisbet et al., 2002; see also Shanahan, Morgan, & Stenbjørre, 1997).

Looking beyond the impact of television as a whole, researchers have found that viewing particular genres of television programming can shape public perceptions of science and technology. For example, Nisbet et al. (2002) showed that science television use was negatively related to reservations about science, in addition to being positively related to factual scientific knowledge. Likewise, Nisbet and Goidel (2007) found that

scientific documentary television viewing was positively related to support for embryonic stem cell research, that Christian television viewing was negatively related to support for embryonic stem cell research, and that science fiction television viewing was positively related to support for therapeutic cloning.

Furthermore, previous research has demonstrated that news media use can influence public perceptions of science and technology. In particular, studies have shown that newspaper reading can shape generalized perceptions of science and technology (Nisbet et al., 2002) as well as support for various forms of science and technology, including embryonic stem cell research (Ho, Brossard, & Scheufele, 2008; Nisbet & Goidel, 2007) and nanotechnology (Scheufele & Lewenstein, 2005). Similarly, scholars have found that newspaper reading can shape both general knowledge of science and technology (Nisbet et al., 2002) and knowledge about specific domains of science and technology (Brossard & Nisbet, 2006). In contrast, previous research has paid little attention to the impact of local television news use on public perceptions of science and technology. Miller, Augenbraun, Schulhof, and Kimmel (2006), however, did demonstrate that viewers can retain substantial amounts of information about science and health from local television news stories, a result that suggests the potential for such news to shape perceptions of science and technology.

Recent studies have pointed to heuristic reasoning and cognitive accessibility as the psychological mechanisms underlying media effects on public perceptions of science and technology. These studies begin with the premise that members of the public are "cognitive misers" who rely on information shortcuts to make sense of the complex realm of science and technology (Brossard & Nisbet, 2006; Nisbet, 2005; Nisbet & Goidel, 2007; see also Besley & Shanahan, 2005). Memory-based models of public opinion, in turn, suggest that people tend to rely on readily accessible information in forming opinions and that the accessibility of a given piece of information in a person's memory is partly a function of how often and how recently the person has been exposed to the information in media content (Zaller, 1992). Thus, media messages can "prime" pieces of information, making those pieces of information not only more accessible in memory but also more likely to influence subsequent judgments (Iyengar & Kinder, 1987). Research has demonstrated that priming can underlie media effects such as cultivation (for an overview, see Shrum, 2002), and several studies have argued that media effects on perceptions of science and technology work through this mechanism (Nisbet, 2005; Nisbet & Goidel, 2007; Scheufele & Lewenstein, 2005).

In sum, previous research regarding media effects on perceptions of science and technology provides both theoretical bases and empirical precedents for expecting relationships between various forms of media use and public perceptions of DNA evidence. Before deriving hypotheses about such relationships, however, we should first consider previous research on media portrayals of DNA evidence as well as the few studies that have provided empirical evidence regarding the potential effects of such portrayals.

Media and Perceptions of DNA Evidence: The “CSI Effect” and Beyond

Popular and scholarly discussion regarding how the media portray DNA evidence and what effects these portrayals might produce has focused on television crime dramas such as *CSI* and its clones. Anecdotal and qualitative accounts have suggested that these programs present DNA evidence as highly reliable, its use in the criminal justice system as both routine and crucial, and the forensic scientists who use it as authoritative (e.g., Cavender & Deutsch, 2007; Gever, 2005; Houck, 2006; Roane, 2005). One recent content analysis of the first six seasons of *CSI* provided systematic evidence in support of these claims (Ley, Jankowski, & Brewer, 2009). Specifically, it found that the show's forensic scientist protagonists searched for DNA evidence in 86% of all episodes, found it in 84%, analyzed it in 77%, and used it to solve a case in 39%. The analysis also found that the investigators virtually never made a mistake in using such evidence.

In terms of effects, popular accounts have suggested that exposure to crime dramas such as *CSI* may shape jurors' responses to forensic evidence in general and DNA evidence in particular (e.g., Roane, 2005; Willing, 2004). These accounts offer no consensus, however, regarding the direction of the expected impact. According to some, such exposure raises jurors' expectations regarding the presentation of forensic evidence by the prosecution and thereby makes it more difficult for prosecutors to win convictions; according to others, exposure to crime dramas fosters confidence in forensic evidence presented by the prosecution and thereby makes it easier for prosecutors to win convictions (for reviews of both sides, see Podlas, 2006; Tyler, 2006).

To date, three studies have presented empirical analyses of the *CSI* effect. Building on evidence that genre-specific television viewing can shape public perceptions of law (e.g., Pfau, 1995; Podlas, 2002), Podlas (2006) tested the antiprossecution version of the *CSI* effect. Using survey data from a student sample, she found that *CSI* viewers were no more likely than others to reach “not guilty” verdicts based on “*CSI*-marked factors” (e.g., the absence of DNA evidence). At the same time, her data suggested a potential

pro-prosecution *CSI* effect given that “in some instances, a lower proportion of *CSI* viewers rendered ‘not guilty’ verdicts relying on *CSI* reasons” (Podlas, 2006, p. 461). She also raised the possibility of a third *CSI* effect: namely, that exposure to the show might foster greater lay understanding of forensic evidence.

Shelton, Kim, and Barak (2006) surveyed people called to jury duty to conduct another test of the antiprossecution version of the *CSI* effect. They found that in some instances, *CSI* viewers reported higher expectations than did nonviewers regarding what forensic evidence (e.g., DNA evidence) the prosecution would present. The authors speculated that this pattern might reflect a learning effect produced by the show. Then again, they found that *CSI* viewers were no more likely than nonviewers to demand forensic evidence such as DNA evidence as a condition for a guilty verdict. The authors went on to suggest that the debate surrounding the *CSI* effect might be framed too narrowly; in particular, they argued that news media coverage might also shape juror perceptions of forensic evidence.

Schweitzer and Saks (2007) provided yet another test of the antiprossecution version of the *CSI* effect by exposing a student sample to a simulated trial transcript. This study did not directly address DNA evidence; instead, it focused on microscopic analysis of hair. The authors found that viewing *CSI* predicted both greater self-reported understanding of forensic science and greater skepticism about the forensic testimony that the prosecution presented in the simulated transcript (though *CSI* viewers did not differ from others in the verdicts they reached). Thus, the authors concluded that their evidence provided some support for the antiprossecution version of the *CSI* effect. They also argued, however, that the antiprossecution and proprosecution versions of the *CSI* effect are “not necessarily at war with each other,” noting that the “prosecution might benefit when it presents any forensic-science evidence, and the defense might benefit when there is no forensic evidence” (Schweitzer & Saks, 2007, p. 358).

The present research expands on these studies by looking at how multiple forms of media use—including not only crime television viewing but also overall television viewing and news media use—are related to public perceptions of DNA evidence among the general public (rather than among students or jury pools). In developing hypotheses about such relationships, it draws on both the existing research regarding the *CSI* effect and the broader literature regarding media effects on public perceptions of science and technology. It also provides tests regarding a psychological process—priming—that previous accounts have identified as a potential mechanism underlying media effects on public perceptions of science and technology.

Hypotheses

The hypotheses for this study revolve around five aspects of public perceptions of DNA evidence. The first is self-perceived understanding of DNA, which has increased over time in conjunction with a rise of media attention to DNA evidence (see above). The second is belief in the reliability of DNA evidence, which has also increased over time (again, see above). The third and fourth involve the weight attached to DNA evidence in jury decision-making scenarios—that is, the extent to which the presence or absence of such evidence as part of the prosecution's case makes one more likely to vote to convict (or acquit). The weight attached to the *presence* of DNA evidence as part of the prosecution's case speaks to the potential for pro-prosecution effects, whereas the weight attached to the *absence* of such evidence as part of the prosecution's case speaks to the potential for antiprosecution effects. The final aspect, support for a national DNA databank, is a dimension of policy opinion.

One hypothesis builds on previous findings that overall television viewing is negatively related to knowledge about science and technology, presumably because it displaces learning opportunities (Nisbet et al., 2002).

Hypothesis 1: Total time spent watching television will be negatively related to self-perceived understanding of DNA.

At the same time, overall television viewing may predict positive perceptions of DNA evidence. Such viewing can cultivate positive perceptions of science and technology in general terms (Nisbet et al., 2002). Moreover, it can cultivate fear of violence and support for social institutions (see, e.g., Gerbner & Gross, 1976; Shanahan & Morgan, 1999). Thus, it is reasonable to posit the following:

Hypothesis 2: Total time spent watching television will be positively related to perceptions of DNA evidence as reliable, weight attached to the presence or absence of DNA evidence, and support for a national DNA databank.

Note that the hypothesis above—and the ones below—build on the argument of Schweitzer and Saks (2007) that pro- and antiprosecution effects can complement one another (in other words, media use can magnify the weight attached to both the presence and absence of DNA evidence).

Just as overall television viewing may be related to public perceptions of DNA evidence, so, too may genre-specific viewing—particularly given that the latter sort of viewing shapes beliefs and knowledge about science and technology in general terms (Nisbet et al., 2002) and in other domains (Nisbet & Goidel, 2007). In light of the debate over the *CSI* effect, the present study examines the role of crime television viewing in predicting perceptions of DNA evidence. Specifically, it builds on previous research (Podlas, 2006; Schweitzer & Saks, 2007; Shelton et al., 2006) by testing the following hypothesis:

Hypothesis 3: Crime television viewing will be positively related to self-perceived understanding of DNA, perceptions of DNA evidence as reliable, weight attached to the presence or absence of DNA evidence, and support for a national DNA databank.

Instead of focusing on any one crime television program, the following account considers the genre as a whole. The original *CSI* has influenced not only its prime-time spinoffs and clones but also similarly themed documentary shows (e.g., *Forensic Files*, renamed as such the year that *CSI* launched); thus, it seems reasonable to treat the *CSI* effect as a phenomenon that may extend beyond its namesake to the genre that it has helped to remake.

The next two hypotheses focus on the potential for news media use to predict perceptions of DNA evidence, a possibility raised by Shelton et al. (2006). Findings that newspaper reading can predict knowledge about science and technology (Brossard & Nisbet, 2006; Nisbet et al., 2002) as well as support for various forms of science and technology (Ho et al., 2008; Scheufele & Lewenstein, 2005) point to a hypothesis:

Hypothesis 4: Newspaper reading will be positively related to self-perceived understanding of DNA, perceptions of DNA evidence as reliable, weight attached to the presence or absence of DNA evidence, and support for a national DNA databank.

Along the same lines, Miller et al.'s (2006) finding that viewers retain science information from local television news provides a basis for speculating that viewing such news will predict self-perceived understanding of DNA. Furthermore, research indicates that local television news frequently covers crime (e.g., Klite, Bardwell, & Salzman, 1997) and may foster fear of crime (e.g., Romer, Jamieson, & Aday, 2003). All of this points to yet another hypothesis:

Hypothesis 5: Local television news viewing will be positively related to self-perceived understanding of DNA, perceptions of DNA evidence as reliable, weight attached to the presence or absence of DNA evidence, and support for a national DNA databank.

The last hypothesis under study addresses priming. Previous studies have argued that this mechanism helps to explain media effects on public perceptions of science and technology (Nisbet, 2005; Nisbet & Goidel, 2007; Scheufele & Lewenstein, 2005), but the evidence for this claim is indirect. To provide a more direct look at whether priming media-related thoughts can shape such perceptions, the present study tests the following expectation:

Hypothesis 6: Exposure to priming of thoughts about media will be positively related to self-perceived understanding of DNA, perceptions of DNA evidence as reliable, weight attached to the presence or absence of DNA evidence, and support for a national DNA databank.

Given that the other hypotheses (except for Hypothesis 1) predict positive relationships between media use and the perceptions of interest, it seems reasonable to expect that priming people to think about media use—and, by association, media content—will tend to make positive perceptions of DNA evidence more accessible in memory.

Data and Measures

The data for this study came from a telephone survey of the adult population in the four-county Milwaukee metropolitan area. The survey was conducted from October 2 to December 20, 2007, by the Institute for Survey and Policy Research at the University of Wisconsin-Milwaukee. The 908 respondents were selected through random digit dialing.¹⁰ This data set was the only one available that included the sorts of measures for public perceptions of DNA evidence and media use needed to test the hypotheses under study.

A series of questions captured the dependent variables of interest. Table 1 presents the question wording and frequency distributions for each of these items. The question regarding self-perceived understanding of DNA followed the wording of an item included in a series of National Science Foundation surveys. Responses were coded as 2 for those who said that they had a *clear understanding* of what the term DNA means, 1 for those who said that they

Table 1. Public Perceptions of DNA Evidence

	Percentage
In articles and on television news shows, the term DNA has been used. When you hear the term DNA, do you have a clear understanding of what it means, a general sense of what it means, or little understanding of what it means?	
Clear understanding	54
General sense	40
Little understanding	6
From what you have read or heard, do you think that DNA evidence is completely reliable, very reliable, only somewhat reliable, or not reliable at all?	
Completely reliable	25
Very reliable	55
Only somewhat reliable	19
Not reliable at all	<1
Suppose that you were on a jury in a murder case, and the prosecution presented DNA evidence that linked the defendant to the crime. Would this make you much more likely to vote to convict, somewhat more likely, a little more likely, or no more likely to vote to convict?	
Much more likely	53
Somewhat more likely	35
A little more likely	8
No more likely	4
Suppose that you were on a jury in a murder case, and the prosecution DID NOT present any DNA evidence that linked the defendant to the crime. Would this make you much more likely to vote to acquit, somewhat more likely, a little more likely, or no more likely to vote to acquit?	
Much more likely	9
Somewhat more likely	29
A little more likely	20
No more likely	42
Please tell me whether you would strongly support, somewhat support, somewhat oppose, or strongly oppose . . . starting a national DNA databank with DNA collected from all criminals, just as we collect fingerprints?	
Strongly support	58
Somewhat support	29
Somewhat oppose	7
Strongly oppose	6

Note: For the entire sample, $N = 908$. The effective N for individual items ranged from 836 to 900.

had a *general sense*, and 0 for those who said that they had *little understanding*. More respondents reported a clear understanding (54%) than did so in the most recent NSF survey (46% in 2001), a finding that may reflect a continuation of the upward trend observed in the NSF surveys (see above). Note that this measure captured self-reported understanding rather than testing actual knowledge (though it is likely that the two are related).

The question regarding perceptions of DNA evidence as reliable paralleled an item included in a series of polls conducted by the Gallup Organization. Responses were coded as 2 for *completely reliable*, 1 for *very reliable*, and 0 for *only somewhat reliable or not reliable at all* (less than 1% of respondents chose the last option). The distribution for this item was similar to the distributions found by Gallup (see Table 1 and above), with a substantial majority (80%) saying that DNA evidence was completely or very reliable.

A pair of questions measured the weight attached to DNA evidence under two jury decision-making scenarios. The first asked respondents whether they would be more likely to vote to convict if the prosecution presented DNA evidence linking the defendant to a murder, whereas the second asked whether they would be more likely to vote to acquit in the absence of such evidence. Responses were coded as 3 for *much more likely*, 2 for *somewhat more likely*, 1 for *a little more likely*, and 0 for *no more likely*. Respondents appeared to attach greater weight to the presence of a DNA link than the absence of such a link, with 88% saying that the former would make them much or somewhat more likely to vote to convict and only 38% saying that the latter would make them much or somewhat more likely to vote to acquit.

The final dependent variable, support for a national DNA databank, was measured by a question that paralleled an item included in a 2000 survey sponsored by the Democratic Leadership Council. Responses were coded as 3 for *strongly support*, 2 for *somewhat support*, 1 for *somewhat oppose*, and 0 for *strongly oppose*. Support was greater in the survey at hand (87%) than in the 2000 survey (80%).

Turning to the key independent variables, overall television viewing was measured by a question asking respondents how many hours of television they watched on an average day. Responses were coded as 0 for *1 hour or less* (22% of respondents), 1 for *2 hours* (29%), 2 for *3 hours* (18%), and 3 for *4 or more hours* (31%).¹¹ The measure for crime television viewing was an index (Cronbach's $\alpha = .67$; $M = 1.36$; $SD = 1.03$) that ranged from 0 to 3 and was created by averaging scores for two questions: one asking respondents how often they watched "prime-time dramas about criminal investigations such as *CSI*, *CSI: Miami*, and *CSI: New York*" (31% did so

regularly, 22% did so *sometimes*, 15% did so *hardly ever*, and 32% *never* did so) and another asking them how often they watched “TV shows about real-life criminal investigations such as *Forensic Files*” (18%, 23%, 21%, and 38%, respectively). Newspaper reading and local television news viewing were measured by items asking respondents how often they read a “daily newspaper” and watched “local TV news”: *regularly* (coded as 3 for each measure; 54% for newspaper and 67% for local television news), *sometimes* (2; 27% and 19%), *hardly ever* (1; 14% and 9%), or *never* (0; 6% for each).¹² The appendix presents the full question wording for the media use measures.

All respondents were randomly assigned to receive one of two forms for the survey: a form that asked the media questions before the DNA questions or a form that asked the media questions after the DNA questions. Those who received the media questions first were coded as 1 ($N = 456$); those who received the DNA questions first were coded as 0 ($N = 452$). This experiment in question order was designed to manipulate whether respondents were primed to think of media when they provided their perceptions of DNA evidence (see Zaller, 1992).

Given evidence that political values and demographics can influence public perceptions of science and technology (e.g., Besley & Shanahan, 2005; Brossard & Nisbet, 2006; Brossard & Shanahan, 2003; Gerbner et al., 1981; Ho et al., 2008; Lee, Scheufele, & Lewenstein, 2005; Nisbet & Goidel, 2007; Nisbet et al., 2002), the analyses also incorporated measures of these factors. Specifically, the model for each dependent variable included a 7-category measure of political ideology (coded to range from 0 for *extremely liberal* to 6 for *extremely conservative*; $M = 3.12$; $SD = 1.41$), a 7-category measure of education (coded to range from 0 to 6; $M = 3.88$; $SD = 1.53$), a 10-category measure of income (coded to range from 0 to 9; $M = 4.75$; $SD = 2.96$), and age in years/100 (median age = 52) as well as dichotomous measures of gender (coded as 0 if *male* and 1 if *female*; 38% and 62%, respectively), self-identification as African American (coded as 0 if *no* and 1 if *yes*; 82% and 18%), and self-identification as Hispanic (coded as 0 if *no* and 1 if *yes*; 95% and 5%).

Results

A series of ordinary least squares hierarchical regression models—one for each dependent variable—were used to test the hypotheses under study.¹³ The first block of independent variables included ideology and demographics; the second block included the media variables. Table 2 presents the

Table 2. Predicting Public Perceptions of DNA Evidence

	Understand DNA	Reliability of DNA Evidence	Convict if DNA Evidence	Acquit if No DNA Evidence	Support DNA Bank
Political ideology	.02 (.02)	.01 (.02)	.04 (.02)	-.06* (.03)	.08** (.02)
Education	.07** (.02)	.02 (.02)	.00 (.02)	-.04 (.03)	-.03 (.02)
Income	.02 (.01)	.01 (.01)	.04** (.01)	-.02 (.02)	.02 (.01)
Female	-.02 (.04)	-.02 (.05)	.05 (.06)	-.07 (.08)	.21** (.06)
African American	.09 (.06)	-.17* (.07)	-.24** (.08)	.17 (.11)	-.29** (.08)
Hispanic	-.16 (.10)	-.03 (.12)	-.02 (.14)	-.12 (.18)	-.15 (.15)
Age/100	-.30* (.14)	-.12 (.16)	-.20 (.18)	.43 (.25)	.18 (.20)
Incremental R ²	.06**	.02*	.06**	.03*	.06*
Time watching TV	-.04* (.02)	.07** (.02)	.04 (.03)	.13** (.04)	.08** (.03)
Watches crime TV	.08** (.02)	.05* (.03)	.02 (.03)	.00 (.04)	.02 (.03)
Reads newspaper	.10** (.02)	.02 (.03)	.03 (.03)	.04 (.05)	.10** (.04)
Watches local TV news	.00 (.03)	.03 (.03)	.01 (.04)	.00 (.05)	.09* (.04)
Media questions first	.04 (.04)	.04 (.05)	.11* (.06)	.22** (.08)	.07 (.06)
Incremental R ²	.04**	.03**	.01	.03**	.04**
Total R ²	.10	.05	.07	.06	.10
N	772	771	759	721	764

Notes: Table entries are unstandardized regression coefficients. Standard errors are in parentheses. One-tailed tests were used to test directional hypotheses regarding the media variables; all other significance tests were based on two-tailed tests.
p* < .05. *p* < .01.

unstandardized coefficients for the independent variables in each model. Estimating the models through ordered probit produced substantively similar findings.

As Table 2 shows, overall television viewing was negatively and significantly related to self-perceived understanding of DNA.¹⁴ Put another way, the heaviest viewers reported less understanding of what DNA means than did the lightest viewers (a -.12 difference on a 0 to 2 scale, all else being equal). Thus, the results provided support for Hypothesis 1.

The results also provided partial support for Hypothesis 2. Time watching television was positively and significantly related to perceptions of DNA evidence as reliable, likelihood of voting to acquit if the prosecution in a murder case did not present DNA evidence, and support for a national DNA databank. Compared with the lightest viewers, the heaviest viewers reported stronger belief in the reliability of DNA evidence (a .21 difference on a 0 to 2 scale), attached greater weight to its absence (.39 on a 0 to 3 scale), and expressed more favorable views toward a DNA databank (.24 on a 0 to 3 scale). Time watching television was not significantly related to likelihood of voting to convict in the presence of DNA evidence.

Watching crime television was positively related to self-perceived understanding of DNA and to perceptions of DNA evidence as reliable. Compared with nonviewers, respondents who regularly viewed crime dramas such as *CSI* and "true crime" programs such as *Forensic Files* showed a stronger tendency to see themselves as having a clear sense of what DNA means (a .24 difference on a 0 to 2 scale) and to believe in the reliability of DNA evidence (.15 on a 0 to 2 scale). Crime television viewers did not differ significantly from nonviewers in their responses regarding the jury decision-making scenarios, nor did they differ in their support for a national DNA databank. Thus, the results provided partial support for Hypothesis 3.

They provided partial corroboration of Hypotheses 4 and 5, as well. Newspaper reading was positively related to both self-perceived understanding of DNA and support for a national DNA databank. Compared with respondents who said that they never read a paper, regular newspaper readers scored .30 higher on each variable (measured on 0 to 2 and 0 to 3 scales, respectively). In addition, watching local television news was positively related to support for a national DNA databank, with regular viewers scoring .27 higher than nonviewers. Neither form of news consumption was significantly related to any of the other dependent variables.

The question order manipulation produced effects on responses to the two jury decision-making scenarios. Compared with those who answered the media questions after the DNA questions, the respondents who answered the media questions first attached greater weight to both the presence and the absence of DNA evidence. In keeping with Hypothesis 6, they showed a stronger tendency to say that they would be more likely to vote to convict if the prosecution presented DNA evidence (a .11 difference on a 0 to 3 scale) and to say that they would be more likely to vote to acquit if the prosecution did not present such evidence (a .22 difference on a similar scale). Receiving the media questions first was not significantly related to the other dependent variables.¹⁵

Taken together, the six hypotheses under study yielded predictions about 25 coefficients (five independent variables $\times$ five dependent variables).

Eleven of these coefficients had the predicted sign and were statistically significant. Eleven more had the predicted sign but were not statistically significant; the other three were zero. In sum, the results yielded considerable evidence of relationships in the hypothesized directions.

Turning to the other variables in the model, ideology was related to the weight attached to the absence of DNA evidence and support for a DNA databank: compared with liberal respondents, conservative respondents attached less weight to the former and expressed more support for the latter. Education was positively related to self-perceived understanding of DNA, whereas age was negatively related to the same dependent variable; both results are consistent with previous findings regarding the impact of education and age on general scientific knowledge (Nisbet et al., 2002). Women expressed greater support for a national DNA databank than did men. Income was positively related to weight attached to the presence of DNA evidence. Compared with others, African American respondents expressed less belief in the reliability of DNA evidence, attached less weight to the presence of DNA evidence, and expressed less support for a national DNA databank—a pattern that is consistent with previous findings of racial divides in public opinion about the criminal justice system (see, e.g., Hurwitz & Peffley, 2005) and the use of DNA technology in it (Duster, 2006).

Conclusion

The results of this study point to a number of relationships between media use and public perceptions of DNA evidence. To begin with, they indicate that overall television viewing was related to such perceptions. Specifically, overall television viewing predicted belief in the reliability of DNA evidence, weight attached to the absence of DNA evidence in a jury decision-making scenario, and support for a national DNA databank. All three relationships are consistent with Nisbet et al.'s (2002) argument that overall television viewing can cultivate beliefs in the promise of science and technology. Likewise, the finding that overall television viewing was negatively related to self-perceived understanding of DNA is consistent with Nisbet et al.'s (2002; see also Shanahan et al., 1997) claim that such viewing can displace learning opportunities. In short, the findings provide corroborating evidence for previous claims about links between overall television viewing and perceptions of science and technology while also extending such claims to a new domain.

Other results shed new light on the recent debate over the *CSI* effect. Although popular accounts have focused on the possibility that crime dramas such as *CSI* will shape jurors' responses to forensic evidence (e.g., Roane,

2005; Willing, 2004), the analyses yielded no evidence that crime television viewing predicted the weight attached to the presence or absence of DNA evidence in jury decision-making scenarios. Thus, the present study echoes previous accounts that failed to find evidence of an antiprossecution *CSI* effect in a jury decision-making context (Podlas, 2006; Shelton et al., 2006; but see Schweitzer & Saks, 2007) while also casting doubt on the notion of a prosecution *CSI* effect in a such a context. On the other hand, watching crime television did predict self-perceived understanding of DNA and belief in the reliability of DNA evidence. The former relationship is consistent with the argument that crime shows may produce learning effects regarding forensic science (Podlas, 2006; Shelton et al., 2006; Schweitzer & Saks, 2007). More generally, both relationships are consistent with claims that viewing specific television genres can shape knowledge and beliefs about science and technology (Nisbet & Goidel, 2007; Nisbet et al., 2002). Taken as a whole, the findings for crime television viewing suggest that it may be useful to shift the debate over the *CSI* effect from a narrow focus on jury decision making to a wider focus on public understanding of and confidence in DNA evidence.

The findings also suggest that Shelton et al., (2006) are correct in arguing that research into media use and perceptions of DNA evidence should consider news media along with crime television. Both newspaper reading and local television news viewing predicted support for a national DNA databank; in addition, newspaper reading predicted self-perceived understanding of DNA. Such relationships may reflect the extensive coverage of DNA evidence by news media. In the case of the DNA databank, they may also reflect crime coverage to the extent that such coverage produces fear of crime and support for crime-fighting institutions (see, e.g., Romer et al., 2003). In broader terms, the findings here reinforce claims that news media use can produce learning and shape opinion regarding science and technology (Brossard & Nisbet, 2006; Ho et al., 2008; Miller et al., 2006; Nisbet et al., 2002; Scheufele & Lewenstein, 2005).

To be sure, the analyses presented here were limited in several ways. The media measures captured exposure rather than attention, though the latter may also produce important effects (see Besley & Shanahan, 2005; Chaffee & Schleuder, 1986). Moreover, the measure for crime television viewing sacrificed the capacity to capture exposure to particular shows (e.g., *CSI*) in order to capture exposure to the genre as a whole. The overall variance explained in each model was low, suggesting that perceptions of DNA evidence may reflect other factors as well, be they systematic, idiosyncratic, or both.

Most importantly, perhaps, the cross-sectional findings described here do not necessarily indicate that overall television viewing, crime television viewing, and news media use *influence* perceptions of DNA evidence. Given that

people's choices regarding media use may reflect psychological and social gratifications (Blumler & McQuail, 1969), an alternative possibility is that perceptions of DNA evidence shape the various forms of media use under study. In the cases of overall television viewing and news media use, however, this seems implausible. It may be more plausible that perceptions of DNA evidence would shape crime television viewing; even here, however, it seems at least as likely—if not more likely—for causality to flow from the latter to the former. Another possibility is that media use exerts indirect effects on perceptions of DNA evidence—for example, by influencing generalized knowledge and beliefs about science (Nisbet et al., 2002), confidence in the authorities who use it (Shanahan & Morgan, 1999), or fears of violence that might be alleviated through crime-fighting efforts (Gerbner & Gross, 1976).

The experiment in question order provides clearer evidence of direct causal influence. Specifically, the findings indicate that receiving the media questions before the DNA questions—rather than the other way around—led respondents to attach more weight to the presence and the absence of DNA evidence in jury decision-making scenarios. A logical interpretation of these results is that the media questions primed thoughts about media content in respondents' memories, thereby making these thoughts more accessible when the respondents subsequently answered the DNA questions. Thus, the results provide support for the argument that priming provides a mechanism by which media use may influence perceptions of science and technology (Nisbet, 2005; Nisbet & Goidel, 2007; Scheufele & Lewenstein, 2005). These results also corroborate the argument that anti- and pro-prosecution effects can complement one another (Schweitzer & Saks, 2007): in the case at hand, the same manipulation produced both sorts of effects. The experimental findings may carry practical courtroom implications, as well, given the possibility for either the prosecution or the defense in a trial to invoke media representations of DNA evidence (see Podlas, 2006).

Last, but not least, the findings presented here may help to explain trends in public perceptions of DNA evidence. Recall that survey results suggested aggregate-level increases over time in self-perceived understanding of DNA and belief in the reliability of DNA evidence. If the relationships found in this study reflect effects produced by media use, then such effects could have contributed to both trends. The negative relationship between overall television viewing and self-perceived understanding of DNA cuts against the trend in the latter, but the positive relationships for crime television viewing and newspaper reading point in the same direction as this trend. Similarly, the positive relationships between overall television viewing and crime television viewing, on the one hand, and belief in the reliability of DNA evidence, on the other, point in the same direction as the trend in the latter. Thus, there is at least a circumstantial case that the proliferation of media messages about

DNA evidence carried consequences for the trajectory of public perceptions. Of course, panel data would be useful in providing a stronger test of this argument. By the same token, laboratory experimentation would be useful in testing for effects of media use on perceptions of DNA evidence, particularly in the cases of crime television viewing and news media use.

Future research could extend the present study's findings in other ways, as well. For example, such research could examine other forms of media use (e.g., science television viewing, national television news viewing) and distinctions between media exposure and media attention (see Besley & Shanahan, 2005). It could look at other dimensions of public perceptions regarding DNA evidence (e.g., perceptions regarding how often criminal investigations and prosecutions rely on DNA evidence), knowledge about forensic DNA testing, perceptions regarding forensic DNA testing in other contexts (e.g., investigations of genocide; see Wagner, 2008), and perceptions regarding other forms of forensic science (e.g., fingerprint analysis; see Cole, 2001). It could incorporate measures of potential moderators and mediators of relationships between media use and public perceptions of DNA evidence. Future research could also look beyond the case of the United States. The use of forensic DNA testing and the dissemination of media messages about such testing are both global phenomena; as an illustration of the latter point, ratings indicated that *CSI* was the most popular television program in the world in 2008, with 84 million viewers.¹⁶ Accordingly, it would be worthwhile to examine relationships between media use and perceptions of DNA evidence among other publics.

Appendix

Survey Questions for Media Variables

1. How often do you read a daily newspaper—regularly, sometimes, hardly ever, or never?
 2. On the average day, about how many hours do you personally watch television?
 3. I'm going to read you a list of certain kinds of TV shows. For each one, please tell me how often you watch this kind of show—regularly, sometimes, hardly ever, or never.
 - The first one is local TV news
 - The next one is TV shows about real-life criminal investigations such as *Forensic Files*
 - Prime-time dramas about criminal investigations such as *CSI*, *CSI: Miami*, and *CSI: New York*
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Notes

1. Retrieved January 13, 2009, from <http://www.fbi.gov/hq/lab/codis/clickmap.htm>
2. Survey by TIME/CNN, December 17-18, 1998. Retrieved May 5, 2009, from <http://www.pollingreport.com/crime.htm>
3. Examples include two 2000 Gallup polls, a 2000 *Newsweek* poll, a 2000 Portrait of America poll, and a 2001 TIME/CNN poll.
4. Survey by the Gallup Organization, March 17-19, 2000. Retrieved May 5, 2009, from <http://www.gallup.com/poll/1603/Crime.aspx>
5. Survey by the Gallup Organization, October 13-16, 2005. Retrieved May 5, 2009, from <http://www.gallup.com/poll/1603/Crime.aspx>
6. Surveys by CBS News, January 2-3, 1995, and May 6-7, 1998. Retrieved May 5, 2009, from the iPOLL Databank, The Roper Center for Public Opinion Research, University of Connecticut (<http://www.ropercenter.uconn.edu/ipoll.html>).
7. Surveys by the National Science Foundation, September 1990 and February 2001. Retrieved May 5, 2009, from the iPOLL Databank, The Roper Center for Public Opinion Research, University of Connecticut (<http://www.ropercenter.uconn.edu/ipoll.html>).
8. According to the Lexis-Nexis Web site (<http://academic.lexisnexis.com/online-services/academic-content-news.aspx>), the database contains the full text of the Final New York City Edition of the *New York Times* for this entire period. The search for "DNA evidence" produced 1,022 hits for the entire period. In comparison, searches for alternative terms produced far fewer hits: 118 for "genetic evidence," 72 for "DNA fingerprint," and 49 for "genetic fingerprint." Each of these alternative terms appeared more often in the post-2000 period than in the 1990-1999 period. Searches for two broader terms—"forensic evidence" and "forensics science"—yielded 613 and 327 overall hits, respectively, with the number of hits for each term increasing over time (though more gradually than

- did the number of hits for “DNA evidence”). A search for “DNA” yielded 8,994 hits overall, with the number of hits increasing dramatically from the early 1990s to the post-2000 period.
9. Retrieved January 13, 2009, from http://en.wikipedia.org/wiki/Crime_Scene_Investigation.
 10. The contact rate for the survey (contacted/(eligible + unknown)) was .61. The cooperation rate (completed/(eligible + unknown contacted)) was .33. The sampling error for the survey was $\pm 3.3\%$. Weighting the data by gender, race, educational level, and presence of children in the household to correspond with 2006 U.S. Census Bureau estimates did not substantially alter the distributions of the dependent variables.
 11. Relatively few respondents (3%) said that they watched zero hours of television. The results were virtually identical when the measure was coded as 0 for *zero hours*, 1 for *1 hour or a fraction of an hour*, 2 for *2 hours*, 3 for *3 hours*, and 4 for *4 or more hours*. Likewise, the results were virtually identical when a separate dichotomous measure capturing whether the respondent watched no television was included in the models.
 12. These response options followed a format regularly used by the Pew Research Center for the People and the Press to measure media use.
 13. The analyses treated the five measures separately given that their inter-item correlations tended to be relatively modest (ranging from $-.08$ to $.36$). All of these correlations were positive and significant at the $.01$ level except for the correlation between self-perceived understanding of DNA and likelihood of voting to acquit in the absence of DNA evidence, which was negative and significant at the $.05$ level.
 14. One-tailed tests were used to test directional hypotheses. All other significance tests were based on two-tailed tests.
 15. Given previous findings that priming respondents to think about media can either reduce cultivation effects (Shrum, 2002) or magnify such effects (Shanahan & Morgan, 1999), supplementary analyses estimated the models from Table 2 in two subsamples: respondents who were asked the media questions first and respondents who were asked the DNA questions first. Most of the relationships between media use and perceptions of DNA evidence that were significant in the full sample were also significant in each subsample (using the $.10$ level as the threshold for significance, a reasonable standard given that the subsamples were half the size of the full sample). There were three exceptions: (a) time watching television was negatively related to self-perceived understanding of DNA among those who received the DNA questions first but not among those who received the media questions first, (b) time watching television was positively related to weight attached to the absence of DNA evidence among those who

received the DNA questions first but not among those who received the media questions first, and (c) watching local television news was positively related to support for a DNA databank among those who received the media questions first but not among those who received the DNA questions first. In two of these three exceptions, however, the nonsignificant relationship approached significance in the expected direction ($p = .11$ for the relationship between overall television viewing and self-perceived understanding of DNA among those who received the media questions first; $p = .11$ for the relationship between watching local television news and support for a DNA databank among those who received the DNA questions first). In sum, the analyses yielded little indication that asking the media questions first either reduced or magnified the relationships between media use and perceptions of DNA evidence.

16. Ratings data were collected by Eurodata TV Worldwide.

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