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Judgement heuristics and bias in evidence interpretation: The effects of computer generated exhibits

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ABSTRACT

The increasing use of multi-media applications, trial presentation software and computer generated exhibits (CGE) has raised questions as to the potential impact of the use of presentation technology on juror decision making. A significant amount of the commentary on the manner in which CGE exerts legal influence is largely anecdotal; empirical examinations too are often devoid of established theoretical rationalisations. This paper will examine a range of established judgement heuristics (for example, the attribution error, representativeness, simulation), in order to establish their appropriate application for comprehending legal decisions. Analysis of both past cases and empirical studies will highlight the potential for heuristics and biases to be restricted or confounded by the use of CGE. The paper will conclude with some wider discussion on admissibility, access to justice, and emerging issues in the use of multi-media in court.

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1. Introduction

The role of the juror is complex and requires – as noted by Kalven and Zeisel in *The American Jury* – "[…] heroic feats of attention and recall well beyond the capacities of ordinary men" (Kalven & Zeisel, 1966, p. 149). Thankfully, since their extensive analysis of the [American] jury system nearly half-a-century ago, we now have a range of methods and technology available to aid jurors understanding, attention and recall, of the increasingly complicated evidence which forms the basis of modern legal proceedings (Feigenson & Spiesel, 2009). There is considerable research into the way in which jurors and juries evaluate evidence and reach decisions (DeMatteo & Anumba, 2009; Williams & Jones, 2005). However, jury research is complicated by a number of factors and not least the sometimes subtle – yet important – differences between cases (Bornstein, 1999; MacCoun, 1989; Rose & Ogloff, 2001), coupled with the very real fact that studies with actual juries are largely prohibited (Bornstein & McCabe, 2005; Penrod, Kovera, & Groscup, 2011; Wiener, Krauss, & Lieberman, 2011). There are, however, a number of models which seek to examine the processes jurors undertake in both the evaluation of evidence and in reaching eventual verdicts (see Levett, Danielson, Kovera, & Cutler, 2005), which have served to illuminate some of the problems with relying on this long established method of legal fact finding (see Groscup & Tallon, 2009; Hastie, 1993).

Technology is also becoming an increasingly important aspect of the way in which legal teams present information (Schofield & Mason, 2010; Wiggins, 2003). Over the last decade there has been a significant expansion in the litigation support industry, although as we will explore, this has not always been without its problems (Feigenson & Spiesel, 2009; Norris, 2011). Indeed, the use of computer generated exhibits (CGE) and animations in particular has become an area of intense debate (Feigenson, 2010; Galves, 2000; Norris, 2012). The purpose of this paper is to illustrate the way in which existing models of jury decision making are inherently supported and influenced by the use of CGE. Moreover, the aim is to align this analysis with some of the wider theoretical and empirical research on judgement and decision making. Whilst a small number of empirical studies have highlighted specific areas such as memory, familiarity, and confidence, there has been less attention focused on incorporating CGE into wider judicial decision making processes. Specifically, the link between the *Simulation Heuristic* (Tversky & Kahneman, 1982) and Pennington and Hastie's (1993) *story model* of juror decision making will be explored in relation to CGE. It is without question that this technology is influencing jurors; however, the task is one of how to theoretically integrate empirical studies into a wider framework for understanding how and why CGE is such a potentially powerful tool in the 21st Century courtroom.

2. Decisions under uncertainty

Jurors make decision in conditions of uncertainty (Baron, 2008; Wells, 2005). Despite what might seem a preponderance of evidence against a defendant, there will remain – nearly always – some reservation over

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culpability; the principle of 'beyond reasonable doubt' provides a level of 'acceptable' discretion in the interpretation of evidence received by the court (Kaptein, 2009). Schum (1993; p. 175) points out that:

> "[…] advocates spend a significant amount of time before trial in structuring the arguments they will offer. Under the best of conditions, this is not an easy task; given a large mass of evidence it may well be an overwhelming task. That different arguments are possible from the same evidence is one reason why there is a trial in the first place."

Judgement under uncertainty is a complex task for human cognition (Gilovich, Griffin, & Kahneman, 2002). Research into decision making biases and heuristics has shown that subtle manipulations of problems and minor alterations to the way in which information is framed, can have dramatic effects upon the outcome of individual and collective judgements (Bodenhausen, 1990; Fischhoff, 1975; Hastie, Schkade, & Payne, 1999). Given the often intricate and multifaceted processes required of the juror in the courtroom, it is not surprising that 'mistakes' can ensue or rather that the outcomes of trials be seemingly at odds with the weight of the evidence for (or against) a defendant(s) (Verheij & Bex, 2009). The use of technology – once seen as a way to aid understanding (see Galves, 2000 for a review) – has come under question from legal commentators and academic researchers as highly influential and potentially prejudicial (Feigenson & Spiesel, 2009; Norris, 2013a,b; Roese, Fessel, Summerville, Kruger, & Dilich, 2006).

Surprisingly, CGE – as one category of trial presentation technology – has received relatively little in the way of empirical examination in respects to their impact in the courtroom (Schofield & Mason, 2010). Original research into this area is complicated by the ability to isolate specific variables and to fully interpret the outcomes solely on the basis of presentation format; however, calls to do so and specific research agendas have been formatted (Dunn, Salovey, & Feigenson, 2006). One such experiment used an ambiguous suicide case to establish the extent to which an animated sequence had the potential to interact and influence the physical evidence (Kassin & Dunn, 1997). Participants were presented with a number of scenarios depending upon whether the evidence had suggested that the deceased had fallen or jumped from a roof of a building. Presented with a decision whether the distance the body was from the edge of the building (either 5–10 or 20–25 ft) and whether this was supported or contradicted by a computer generated animation of the incident, results suggested that when the physical evidence was consistent with the animation, the CGE improved juror decision making accuracy. However, when the animated sequence was opposed by the written description, the CGE served to interfere with judgements, often leading them to make less precise decisions regarding where the body would have landed (i.e., if the person had fallen or jumped). Most importantly, the animation influenced the decisions of a significant number of participants to the extent that they believed a falling object (i.e., a person who slipped and fell) could land some 20–25 ft from the edge of a building. Kassin and Dunn concluded their paper with the assumption that people are 'poor intuitive physicists' and therefore easily influenced by information presented to them in the format of a CGE. Ultimately, their study demonstrated the powerful effects that the use of technology can have on decision making and the way in which clever use of presentation techniques could have over people when situations require interpretation of potentially testing concepts.

Psychological theories have also been utilised to explain the way in which CGE might be beneficial to the overall level of comprehension in a trial. One such experiment (Morell, 1999) was designed to test Mayer's 'Dual-Coding Theory of Multi-media Learning' and examined four groups of mock jurors separated by different presentation styles (expert testimony with visual aids, expert testimony with diagrams, expert testimony with computer animation, and expert testimony with diagrams and computer animation). Recall was tested after a two-week delay and – in line with expectations – the latter two conditions significantly outperformed the singular visual aids/diagram sequences. The theory underpinning the dual-coding process consists of a range of psychological components, including working memory (Baddeley, 1992) and cognitive load theory (Sweller, Chandler, Tierney, & Cooper, 1990). Morell's study creates a number of important questions regarding the way in which jurors assimilate evidence presented in this way and additional theories taking into account a range of psychological processes in legal contexts are needed before we can begin to fully understand the way this mode of delivery influences the judicial process.

Major trials have sought to use CGE to present specific and important details of their cases. The ongoing trial[1] of Oscar Pistorius includes a 'dream team' of experts, including animation specialists from the US (Findlay, 2014). The recent case in Italy over the murder of British student, Meredith Kercher, highlights the way in which CGE can be employed to 'fit' the evidence; with the acquittal and subsequent reconviction of Amanda Knox and her co-defendant, the validity of the graphic animated sequence can be called into question (Norris, 2011). At a basic level, jurors and other legal decision makers must be made aware that these exhibits are merely a representation of one potential sequence of events (Dunn et al., 2006). Potentially, the vivid and easily compressible nature of these demonstrations can be linked to hypothesised models of jury decision making. Pennington and Hastie's (1986) 'story model' is one such example that will be argued is reflected in the construction of CGEs — itself subject to various heuristics and biases. In most trials there will always be some element of ambiguity, as evidence is discredited and witnesses cross-examined and many empirical studies in judgement and decision making have identified some prominent heuristics present in our courtrooms.

3. Heuristics and biases in jury decision making

The representativeness heuristic is a simple assessment of how much a specific person, object or event is similar in nature or occurrence to a larger sample or population. Basically, how comparable is our sample event/person to the population event/person we most readily retrieve from memory? Tversky and Kahneman (1983) suggested that: "[r]epresentativeness tends to covary with frequency: Common instances and frequent events are generally more representative than unusual instances and rare events." In addition to the general tendency to acquiesce towards similar explanations, there were a number of re-examinations/reconfigurations of the representativeness heuristic (Kahneman & Frederick, 2005). Examinations of this heuristic have revealed various elements related to specific conditions, for example, the *conjunction fallacy* — the belief that two events that occur in sequence are more likely than those which occur singularly (Hertwig and Gigerenzer, 1999). Hence, although we believe we have a good judgement on the likelihood of events occurring, we do in fact make regular systematic errors based on our hard-wired capacity to rely on the representativeness heuristic. The availability heuristic is another frequent decision bias which in essence demonstrates how people overestimate the way in which the ease with which a particular event or association can be brought to mind is likely to indicate that this occurrence is more probable. Kahneman and Tversky (1998)(cited in Kahneman, Slovic & Tversky, 1982, p. 164) proposed that: "[a] person is said to employ the availability heuristic whenever he estimates frequency or probability by the ease with which instances or associations come to mind […] Availability is an ecologically valid clue for the judgement of frequency because, in general, frequent events are easier to recall or imagine than infrequent ones". We can see that the availability and representativeness heuristic are similar in that they both account for the way in which we tend to prefer or rely more on information

[1] June 2014.

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