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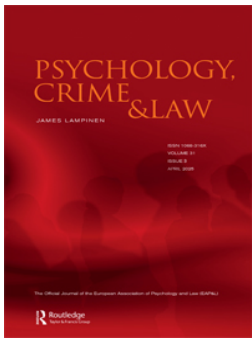
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REVIEW ARTICLE



Gore, gut feelings, and guilt: a systematic review on the emotional impact of gruesome evidence on guilt decisions

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ABSTRACT

Previous research has shown that gruesome evidence influences guilt decisions in criminal proceedings. The current systematic review explored the underlying mechanism of this effect. More specifically, it critically scrutinized the literature on the potential mediating role of emotion in the effect of gruesome evidence on guilt decisions. A search in Web of Science, EBSCOhost, and ProQuest revealed 9 empirical studies (in 8 articles) that tested for this potential mediating effect. A synthesis of the literature suggests that specific emotions play a different role: disgust seems to show a mediating effect, whereas fear-related emotions, and general positive and negative affect do not. Studies on sadness and anger-related emotions paint a similar picture, as the majority of studies do not support a mediating effect, although the effect of anger seems to partly depend on the type of anger measured. To better understand the (unwanted) role that emotions evoked by gruesome evidence play in decisions about guilt, more research is needed with representative samples – preferably with real judges, but also with other actors in the criminal justice system – taking into consideration the role of deliberation between participants.

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The digital culture has greatly influenced our lives, and has affected the courtroom as well. For example, (audio)visual techniques have been used increasingly to present evidence, providing a more vivid, richer, and a more realistic picture of the evidence (Rempel et al., 2019). Public prosecutors use photographic or video material to support their prosecution. Although judges can get closer to the sometimes gruesome truth, the impact of these digital resources can be a cause for concern (Bornstein & Nemeth, 1999; Feigenson & Spiesel, 2011; Rempel et al., 2019). For example, previous research shows that the presentation of evidence that is seen as gruesome influences how judges or jury members decide on guilt and sentencing (Douglas et al., 1997; Grady et al., 2018; Salerno, 2017).

Gruesome evidence refers to detailed depictions of a victim's injuries or suffering in a highly graphic manner, such as bloody wounds or mutilations (Grady et al., 2018). There is

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no standard for what exactly is considered 'horrific'; how gruesome one finds evidence is subjective. Formally speaking, the degree of gruesomeness should not play a role in truth finding, as it does not increase the severity of the crime or the burden of the proof in itself. In certain (common law) countries, such as the United States and Canada, it is even possible to exclude certain evidence that provokes an excessive emotional reaction, when it is considered as outweighing the relevance of the material (see Federal Rule of Evidence, rule 403). Essentially, the court balances the relevance of the evidence against the potential harm it might cause during the trial (in terms of a fair and efficient legal process). Yet Grady et al.'s (2018) meta-analysis shows that, although the effect is small, guilty verdicts are more common in cases in which gruesome photographic evidence is presented than in cases in which neutral photographic evidence is present. Compared to the complete absence of any form of visual evidence, the effect of gruesome photographs on the verdict is even greater (Grady et al., 2018). Therefore, the presence of gruesome evidence increases the chance of a conviction. Moreover, the choices made when taking photos of the injury (specific details or the angle of the photo taken) and when selecting images for the criminal file (which photos? In color or black and white?) can influence the outcome of the criminal case.

One explanation for the influence of gruesome evidence on decision-making is the emotional response that gruesome evidence can evoke (Feigenson & Park, 2006; Salerno & Bottoms, 2009). Emotional responses are generally associated with a greater degree of vividness (Bell & Loftus, 1985). This vividness is enhanced by the current possibilities of (audio)visual techniques: details of a case can be presented in an (even) more gruesome manner on large color screens in the courtroom and can therefore have more impact on the observer (Malsch, 2013). The growing digitization and availability of images in the criminal justice system can hence create more room for the experience of emotion. Judges cannot just 'switch off' these emotions. However, if emotions influence the outcome of a criminal case, this can be at odds with the impartiality of the judiciary. After all, judges (or jury members) are regarded as impartial decision-makers, who base their judgment on objective facts as evidenced by the file or the hearing (Boyll, 1991; Maroney & Gross, 2014). It is therefore important to gain more insight into the role that emotions evoked by gruesome images play in decisions in the criminal justice process.

Although overview studies and meta-analyses on the influence of gruesome evidence on (judicial) judgments have already been published (e.g. Grady et al., 2018), to date there is no overview study into the underlying explanatory (emotion) mechanism. In the current article we therefore conduct a systematic literature review into the mediating role of different types of emotions in the effect of gruesome evidence on the guilt decision. That is, we investigate to what extent the effect of gruesome evidence on decisions about guilt can be explained by emotions evoked by the gruesome evidence. In what follows, we first explain how affective triggers are able to guide decision-making by discussing the role of information processing strategies, and then provide a theoretical explanation of how *specific* emotions steer judgments and decisions.

Explaining the effect of emotions on judgments and decisions

Information processing strategies

One way in which emotions influence judgment is through the activation of certain information processing strategies (Feigenson & Park, 2006), which becomes apparent in, for

example, Forgas's 'affect infusion model' (AIM) (Forgas, 1994, 1995). In this model, Forgas describes how negative emotions resulting from emotionally suggestive information, such as gruesome evidence, can influence the way information is processed. According to AIM, this influence can go two ways. On the one hand, information processing can involve a targeted search pattern, limiting the influence of emotion on decision-making. This is for example the case when an individual clearly knows the information that is needed to make a judgment. In contrast, Forgas (1994, 1995) states that there is a risk of influence by emotion when there is no targeted search pattern and a much more open attitude must be adopted to arrive at a judgment. Hence, when confronted with evidence that arouses emotion, one might be more inclined to judge in line with that emotion. Emotions can then steer the information processing in a certain direction, making the judgment more consistent with the emotional state, which is called 'emotion mood-congruent judgment' (Forgas, 1994, 1995; Mayer et al., 1992). In a similar vein, Schwarz and Clore (1983, 2003) demonstrate the process of 'affect-as-information': individuals may (mis)attribute their affective state to the situation at hand, using their emotion(s) as input for their decisions. To illustrate, a sad individual will find it more likely that the weather is bad instead of good, and an angry individual will find it more likely that the suspect is guilty than innocent. In this way, gruesome evidence can also influence the way information is processed and ultimately align the judgment of guilt with the negative emotion generated.

Alicke's (2000) 'culpable control model' also describes how evidence with strong negative emotional stimuli can bias judgments toward the evaluator's emotional state. This model states that emotion results in a biased search for incriminating information, on the basis of which a judgment is made. Gruesome evidence can lead jurors to formulate their decisions based on emotion-driven explanations rather than logic and facts (Alicke, 2000). The strength of this emotion effect depends on the degree of guilt and culpability that can be attributed to the suspect on the basis of the evidence. For example, Alicke et al. (2008) argued that when the evidence is very strong and guilt is established, the effect of emotion on culpability is small. However, this also applies the other way around: when the evidence is relatively unclear and ambiguous, the effect of the evaluator's emotional state on the judgment of guilt is greater (Alicke et al., 2008).

The role of specific emotions

The aforementioned theoretical models consider the role of emotionality per se as an explanatory mechanism – stating that decisions might be 'emotion congruent'. However, these models do not necessarily explain how *specific types* of emotions can result in specific judgments and behaviors. Researchers have distinguished different types of emotions and have argued that these emotions influence decision-making differently, even if they are of the same valence (e.g. DeSteno et al., 2004; Frijda et al., 1989; Plutchik, 1994; Roseman et al., 1994; Scherer, 2005). Before addressing this more thoroughly, it is important to first explain how emotions arise. Emotions arise in response to an event, context, or outcome that is considered relevant to an individual's goals, motives, or concerns (Frijda, 1988). Frijda (1986) emphasized that emotions are not just passive experiences but are closely linked to action tendencies. For example, anger might prepare an individual for confrontation, while fear might prepare them for avoidance. The concept of 'action readiness' highlights the functional aspect of emotions in regulating interactions with the environment. Emotions, according to Frijda, are essential

for adaptive behavior, as they prepare individuals to respond appropriately to various challenges and opportunities. Understanding these (evolutionary) functions helps explain how emotions can influence various aspects of human behavior, including decision-making processes in legal settings. Jurors' specific emotional responses to evidence can shape their perceptions and judgments, ultimately affecting trial outcomes.

For example, Lerner and Keltner (2000) argue from their 'appraisal tendency' framework that some emotions are associated with certainty (such as anger, disgust, happiness) and some with uncertainty (such as fear, worry, sadness). The emotions sadness and fear are less likely to influence judgment than anger, as sadness and fear are accompanied by uncertainty and information is therefore processed more carefully and deliberately (Bandes & Salerno, 2014; Salerno & Bottoms, 2009). Anger, on the other hand, is accompanied by certainty; its central concern involves someone else's blame for the negative event caused (Frijda et al., 1989; Roseman et al., 1994). On the basis of anger, judgments of evidence are more likely to emphasize the perpetrator's own blame (Bodenhausen et al., 1994; Tiedens & Linton, 2001). Anger can cause ambivalent evidence to be interpreted in a negative way and increase the tendency to take negative action towards the perpetrator (Bandes & Salerno, 2014; Thompson & Dennison, 2004). Anger serves to address perceived injustices or threats to one's well-being, and can motivate individuals to confront and rectify wrongs (Darley & Pittman, 2003; Van Doorn et al., 2014). One way to do so, is by punishing the person that is to blame (Goldberg et al., 1999; Tetlock et al., 2007). Hence, in a jury setting, anger towards a defendant perceived as guilty might lead jurors to advocate strongly for a conviction or higher punishment.

Although it has been argued that fear and sadness are not as likely to determine judgment as the experience of anger, some studies suggest that their role in legal decision-making should not be underestimated. For example, both sadness and fear can lead to more cautious decision-making. Studies by Thompson and Smith (2018) reveal that sad individuals tend to be more risk-averse, and a meta-analysis by Wake and colleagues (2020) shows that fear is related to decreased risky decision-making. In legal contexts, this may manifest as conservative verdicts or reluctance to assign blame. Indeed, for jurors who viewed the sentencing phase of a capital murder trial – and reported increased anger and sadness, but not fear – only an increase in anger was more likely to result in a death sentence verdict (Nuñez et al., 2015).

The emotion of disgust is also associated with (the evaluation of) gruesome evidence. Disgust evolved to protect individuals from harmful substances and pathogens (Rozin et al., 1999). It can also extend to moral disgust, where individuals react strongly to behaviors they find morally reprehensible (Rozin et al., 1999; Schnall et al., 2008). Landy and Goodwin's (2015) meta-analysis shows that disgust can enhance individuals' moral judgment. In a jury setting, disgust towards a defendant's actions might lead to harsher judgments. Coppelmans et al. (2024) also show that the experience of disgust is associated with a tendency to criminalize behavior. Hence, gruesome evidence that evokes the emotion of disgust might result in a strong tendency to find the suspect guilty.

The current review

Previous research and theory have suggested that emotions play a role in decision-making, and specifically in the effect of gruesome evidence on judicial decision-making

about guilt. However, no efforts to date have been made to systematically scrutinize the literature on emotion(s) as a potential explanatory mechanism. The current systematic review is aimed at doing so, taking into account the role of specific types of emotion in decision-making. Providing such insight is particularly important if an enhanced emotional effect in the criminal justice context is deemed undesirable. Concerns, for example, stem from the possibility that the presentation of gruesome evidence leads to biased, emotion-based, decision-making, which hinders the defendant's right to a fair trial (Bright & Goodman-Delahunty, 2006). The current systematic review assesses this concern by investigating the degree to which gruesome evidence increases the likelihood of convictions through affective routes.

Method

We have followed the 'Preferred Reporting Items for Systematic Review and Meta-Analysis' (PRISMA), including the PRISMA-Protocol checklist (Page et al., 2021). The data, analytic code, and other materials used in the review are available upon request. A librarian from Leiden University was consulted for the selection of databases.

Search strategy

A search string was entered into the three large databases that include publications on the intersection of law, criminology, and psychology: Web of Science (all databases), EBSCO host (Academic Search Premier, APA PsycArticles, APA PsycInfo, Criminal Justice Abstracts, ERIC, MEDLINE, Psychology and Behavioural Sciences Collection), and ProQuest (PTSDpubs, Publicly Available Content Database, Sociological Abstracts, Worldwide Political Science Abstracts). The search string itself consisted of four parts of search terms – focused on gruesomeness, evidence, emotions, and the guilt decision – each with a variety of synonyms inspired by the thesauri of the databases: ((gruesome OR evocative OR graphic) AND (evidence OR proof) AND (emot* OR affect OR anger OR angry OR disgust* OR fear* OR sad*) AND (convict* OR sentenc* OR punish* OR incarcerat* OR culpa* OR decid* OR decision* OR verdict* OR judg* OR judicial OR 'legal response' OR guilt)). Furthermore, we examined the reference sections of the studies we decided to include to see if relevant studies were missing in our initial search. The first two authors executed this literature search in April 2024.

In- and exclusion criteria

Articles were included if: (a) they concerned published scientific empirical studies, (b) in English, (c) presenting a decision regarding the guilt of the suspect as a dependent variable. In addition, (d) the study must present some form of gruesome evidence as an independent variable and (e) the study used emotion as an underlying explanatory mechanism (i.e. mediator). Books (not dissertations) or legal reviews were excluded, as these generally do not contain the outcomes of specific empirical studies. There were no year constraints in selecting publications.

Search process

The search in all three databases yielded 384 hits (EBSCOhost: 234; Web of Science: 142; ProQuest: 8). After exportation and removal of duplicates in each database, 290 publications remained. A check of titles and abstracts left us with 12 potentially relevant publications, which were submitted to a full-text read. Of these, one was an unpublished doctoral dissertation (Modin, 2007), of which no full text was available. In addition, three publications were excluded because they did not measure guilt decisions (Bright & Goodman-Delahunty, 2011) and no mediation of emotion (Capestany & Harris, 2014; Nemeth, 2002). Therefore, 8 publications containing 9 studies were analyzed. Figure 1 presents the search process.

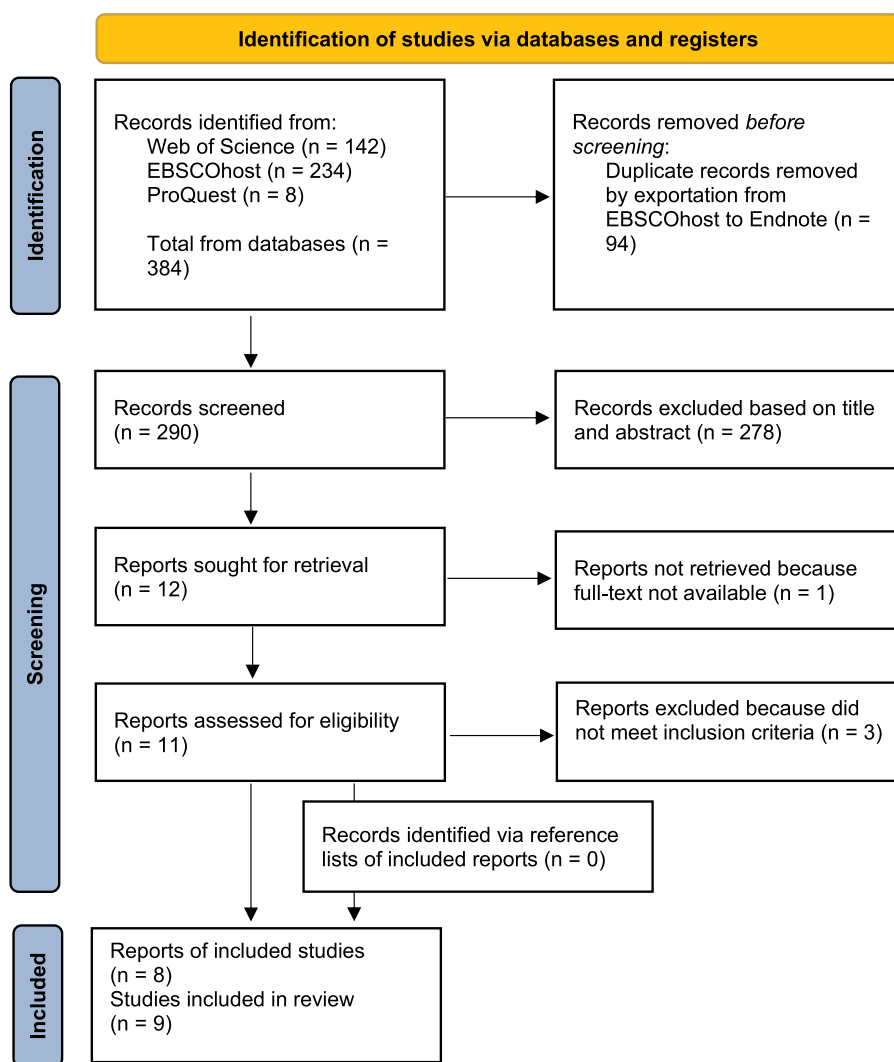


Figure 1. PRISMA flow diagram of the literature search and selection process.

Quality assessment

To determine the quality of the included studies, we combined aspects from the Cambridge Quality Checklist (Murray et al., 2009) with aspects from a previously published systematic literature review containing experimental studies (Van Doorn & Koster, 2019). The following criteria – each scored 0 (inadequate) or 1 (adequate) – were included: (a) sampling method (random or total population sample = 1; convenience sample (e.g. students) or case-control = 0); (b) sample size (≥ 50 participants per condition¹ = 1; < 50 participants per condition = 0); (c) manipulation check of gruesome evidence (present = 1; absent = 0); (d) gruesome evidence modality (multiple (photographic/written/auditory) = 1; single = 0); (e) measurement emotionality (type of emotion varied = 1; other = 0). The maximum possible score on study quality is five. Table 1 presents an overview of the quality assessment. The first two authors completed the quality assessment and disagreements were solved during the consensus meeting in April 2024.

The quality of the studies reviewed varied across several key aspects. First, only Perez (2016) and Salerno (2017) employed representative samples, while most other studies relied on convenience samples, which limits external validity. All studies used student or panel member samples, except Cush and Goodman-Delahunty (2006), who used school teachers as participants. Importantly, Salerno's (2017) studies were the only ones with adequately powered sample sizes, enhancing the reliability of their conclusions. In contrast, most other studies included fewer than 50 participants per condition, reducing the robustness of their statistical analyses and the overall reliability of their results. A notable limitation is the absence of manipulation checks on the gruesome evidence in Douglas et al. (1997) and Perez (2016). Although Edwards and Mottarella (2014) did include a manipulation check, it revealed that participants did not perceive the evidence as particularly 'gruesome', thereby limiting the validity of their findings.

All studies relied on photographic evidence to examine the effects of gruesome evidence, except Thompson and Dennison (2004), who solely used written descriptions. Three studies explored multiple modalities: Bright and Goodman-Delahunty (2006) and Perez (2016) examined both photographic and written evidence (although Perez (2016)

Table 1. Quality assessment of included studies.

Study	Sampling method	Sample size	Manipulation check	Gruesome evidence modality	Measurement emotion	Total
Bright and Goodman-Delahunty (2006)	0	0	1	1	1	3
Cush and Goodman-Delahunty (2006)	0	0	1	0	1	2
Douglas et al. (1997)	0	0	?	0	1	1
Edwards and Mottarella (2014)	0	0	1	1	1	3
Matsuo and Itoh (2016)	0	0	1	0	1	2
Perez (2016)	1	0	0	1	1	3
Salerno (2017) – Study 1	1	1	1	0	1	4
Salerno (2017) – Study 2	1	1	1	0	1	4
Thompson and Dennison (2004)	0	0	1	0	1	2

Note: ? = unsure whether one of the measures was included as a manipulation check. Participants were asked their opinions regarding the importance and impact of this type of photographic evidence.

did not directly compare these modalities), while Edwards and Mottarella (2014) included photographic and auditory evidence.

In terms of measuring emotions, all studies assessed multiple emotions, most commonly disgust, anger, sadness, and fear. However, most relied on single-item, self-reported measures. More comprehensive tools, such as the Positive and Negative Affect Schedule – Expanded Form (PANAS-X) or the Juror Negative Affect Scale (JUNAS)², were used by Edwards and Mottarella (2014), Bright and Goodman-Delahunty (2006), and Matsuo and Itoh (2016). These tools enhance the content validity of their emotional assessments, providing richer insights into participants' emotional responses.

This quality assessment guides the interpretation of the findings regarding the mediating role of emotions in the effect of gruesome evidence on guilt decisions, as discussed below.

Results

Study characteristics

Table 2 provides an overview of the study characteristics. All nine studies were experimental and conducted exclusively in countries with jury trial systems. Four studies were conducted in the United States (Edwards & Mottarella, 2014; Perez, 2016; Salerno, 2017, Studies 1 and 2), three in Australia (Bright & Goodman-Delahunty, 2006; Cush & Goodman-Delahunty, 2006; Thompson & Dennison, 2004), one in Canada (Douglas et al., 1997), and one in Japan (Matsuo & Itoh, 2016). The guilt assessments focused primarily on cases of murder and/or manslaughter, with the exception of one study that included aggravated assault as the crime type (Perez, 2016). Guilt decisions were generally measured dichotomously (guilty/not guilty). The most recent study was conducted in 2017, whereas the oldest study dates from 1997.

Disgust

Six studies have investigated whether disgust mediates the effect of gruesome evidence on decisions about guilt. Among them, three studies found a significant mediating role for disgust (Perez, 2016; Salerno, 2017, Studies 1 and 2), while three others did not (Bright & Goodman-Delahunty, 2006; Cush & Goodman-Delahunty, 2006; Matsuo & Itoh, 2016).

In Salerno's (2017) studies, participants exposed to gruesome color photos led to more guilty judgments compared to the same photos in black-and-white or to the absence of such photographic material. This effect was explained by increased feelings of disgust: gruesome color photos elicited greater disgust responses. Similarly, Perez (2016) found a mediating effect of disgust, showing that photographic and written gruesome evidence led to higher conviction rates through the emotion of disgust.

Conversely, Matsuo and Itoh (2016) found no direct or indirect effects of disgust on guilt decisions when gruesome photographic evidence was used. Bright and Goodman-Delahunty (2006), who included both written and photographic gruesome evidence, reported that while gruesome evidence did evoke disgust, this emotion did not mediate the relationship between gruesome evidence and guilt. Lastly, Cush and Goodman-Delahunty (2006) employed a combined emotion measure called 'defendant

Table 2. Overview of included studies.

Author, year	Participants	Design	Crime type	IV: Type of gruesome evidence	DV: Guilt decisions	Mediator: Type of emotion	Effect evidence on emotion	Mediating effect emotion
Bright and Goodman-Delahunty (2006)	Students (N = 102; 70% female) from Australia	2 (verbal evidence: gruesome vs. non-gruesome) x 3 (visual evidence: no photographs vs. neutral vs. gruesome)	Murder	Written description (with or without detailed descriptions of the wounds) Photographic	Guilty vs. not guilty	Pre-post difference score towards event	+	n.s.
						Disgust		
						Anger		
						Sadness		
						Fear/anxiety		
Cush and Goodman-Delahunty (2006)	School teachers (N = 108; 65% female) from Australia	2 (photographs: gruesome vs. neutral) x 3 (instruction: pre vs. post vs. none) between-subjects design	Murder	Photographic	Guilty vs. not guilty	Sympathy towards victim	+	n.s.
						Defendant negativity (anger, disgust, contempt)		
						Defendant compassion (sympathy, pity, sadness)		
						Victim compassion (sympathy, pity, sadness)		
						Event negativity (anger, horror, disgust, sadness)		

(Continued)

Table 2. Continued.

IV:						
Author, year	Participants	Design	Crime type	Type of gruesome evidence	DV:	Mediator: Type of emotion
					Guilty decisions	Effect evidence on emotion
						Mediating effect emotion
Douglas et al. (1997)	Students (N = 120; 68% female) from Canada	2 (gruesome photographs: black & white vs. color) x 1 (non-gruesome photographs) between-subjects design	Murder	Photographic	Guilty vs. not guilty The extent to which participants believed the accused was guilty, on a 10-point scale	Anxious Stressed Anguished Sad Disturbed Sympathetic Outraged Vengeful Shocked Negative + + + n.s. + n.s. + + + n.s.
Edwards and Mottarella (2014)	Students (N = 532; 65% female) from the U.S.	3 (images: graphic vs. neutral vs. none) x 2 (auditory: absent vs. present) x 2 (instructions: standard vs. revised) between-subjects design	Murder	Photographic Auditory	Guilty vs. not guilty	Positive affect Negative affect Fear Hostility Guilt Sadness Joviality Self-assurance Attentiveness n.s. n.s. n.s. n.s. n.s. n.s. n.s. n.s. n.s.
Matsuo and Itoh (2016)	Students (N = 112; 70% female ^d) from Japan	2 (emotional testimony: present vs. absent) x 2 (gruesome photographs: present vs. absent) between-subjects design	Murder	Photographic	Guilty vs. not guilty Confidence in verdict (1 = absolutely not guilty – 10 = absolutely guilty)	Anger Disgust Sadness Fear/anxiety n.s. n.s. + n.s.
Perez (2016)	MTurk panel members (N = 407; 51.3% female) from the U.S.	2 (witnessing conditions: good vs. bad) x 3 (instruction type: no instructions/control condition vs. modified instructions vs. Henderson instructions) x 2 (gruesome evidence: neutral photograph vs. gruesome photograph) between-subjects design	Aggravated assault	Photographic with a written description included	Guilty vs. not guilty	Negative emotions Sadness Anxiety Anger Contempt Disgust Positive emotions Interest Curiosity Surprise + + + + + n.s. n.s. n.s.

Salerno (2017) – Study 1	MTurk panel members (N = 193; 40% female) from the U.S.	2 (gruesome photographs: black & white vs. color) x 1 (non-gruesome photographs) between-subjects design	Murder	Photographic	Guilty vs. not guilty	Disgust Anger	+ (for color gruesome photographs) n.s.	+ (for color gruesome photographs)
Salerno (2017) – Study 2	MTurk panel members (N = 354; 51% female) from the U.S.	3 (photographs: gruesome black & white vs. gruesome color vs. non-gruesome) x 2 (defense evidence strength: weak vs. strong) between-subjects design	Murder	Photographic	Guilty vs. not guilty	Disgust Anger	+ (for color gruesome photographs) n.s.	+ (for color gruesome photographs)
Thompson and Dennison (2004)	Students (N = 128; 87.5% female) from Australia	2 (graphic evidence of violence: present vs. absent) x 2 (judicial instructions: standard vs. graphic-specific) between-subjects design	Murder	Written description (adding adjectives, using more imagistic verbs and phrases, and conveying information using more specific terms)	Not guilty of murder vs. not guilty of murder but guilty of manslaughter vs. guilty of murder	Stressed Anguished Disturbed Shocked	+ n.s. n.s. n.s.	n.s.

^aNo actual mediation analysis is reported. Participants asserted that they did not rely on emotion when making a culpability decision (86%).
^bDespite the absence of some direct effects of gruesome evidence on emotion, this study still tested for a mediating effect of the emotion in question.
^cThe effect of graphic evidence on hostility and sadness was only marginally significant at the ANOVA level, but the authors decided to still further investigate whether the reported verdict decisions were related to participants' reported hostility and sadness.
^dOnly the distribution before the dropout of participants is reported.

negativity,' which included disgust, anger, and contempt. However, they could not isolate a specific impact of disgust, and they did not find a direct or indirect effect of gruesome evidence on this combined emotion measure and the guilt decision.

Taking the quality of the studies into account, we place greater emphasis on those that found disgust to mediate the effect of gruesome evidence on guilt decisions. The studies by Perez (2016) and Salerno (2017, Studies 1 and 2) that demonstrated this mediating effect are of higher quality, particularly in terms of sample representativeness and adequate sample sizes. In contrast, the studies by Bright and Goodman-Delahunty (2006), Cush and Goodman-Delahunty (2006), and Matsuo and Itoh (2016) had smaller sample sizes, with fewer than 50 participants per condition, weakening the reliability of their findings. Moreover, Cush and Goodman-Delahunty (2006) used a combined emotion measure, making the specific role of disgust unclear. Although Bright and Goodman-Delahunty (2006), and Matsuo and Itoh (2016) employed more comprehensive, validated emotion measures compared to the single-item, self-reported measures in Salerno's (2017) studies, we still consider Salerno's (2017) overall study quality to be stronger (see Table 1). From these studies we conclude that feelings of disgust play a mediating role in the effect of gruesome evidence on guilt decisions.

Fear

Six studies have examined whether fear-related emotions (such as fear, anguish, or anxiety) mediate the effect of gruesome evidence on decisions about guilt. Of the six studies, five found no significant mediation of fear (Bright & Goodman-Delahunty, 2006; Edwards & Mottarella, 2014; Matsuo & Itoh, 2016; Perez, 2016; Thompson & Dennison, 2004), while one study reported partial mediation depending on the specific type of fear (Douglas et al., 1997).

Among the five studies that did not find significant results, three utilized a mix of evidence types: Bright and Goodman-Delahunty (2006) and Perez (2016) used both photographic and written gruesome material, while Edwards and Mottarella (2014) included photographic and auditory evidence. Thompson and Dennison (2004) relied solely on written evidence, and Matsuo and Itoh (2016) tested photographic evidence, yet neither found a mediating effect of fear.

In contrast, Douglas et al. (1997) used photographic evidence and found that an anxious emotional state mediated the effect of gruesome evidence on guilt decisions, although 'anguish' did not show a similar effect. Given that Douglas et al. (1997) is the only one of six studies to find a partial mediating effect of fear, and considering the overall lower quality of that study (see Table 1), we conclude that fear does not mediate the effect of gruesome evidence on guilt decisions.

Anger

Eight studies have investigated whether anger-related emotions (anger, outrage, vengeance, or hostility) mediate the effect of gruesome evidence on guilt decisions. The majority, six studies, found no significant mediation of anger (Cush & Goodman-Delahunty, 2006; Edwards & Mottarella, 2014; Matsuo & Itoh, 2016; Perez, 2016; Salerno, 2017 – Study 1 and 2), while one study reported significant mediation (Douglas et al.,

1997), and another only found mediation for a specific type of anger (Bright & Goodman-Delahunty, 2006).

Among the six studies with non-significant findings, five relied on photographic evidence (Cush & Goodman-Delahunty, 2006; Edwards & Mottarella, 2014; Matsuo & Itoh, 2016; Salerno, 2017 – Studies 1 and 2), while one used a combination of written and photographic evidence (Perez, 2016). In contrast, Douglas et al. (1997) found that emotions such as outrage and vengeance triggered by gruesome photographic evidence led to stronger beliefs in the defendant's guilt. Similarly, Bright and Goodman-Delahunty (2006) observed that while gruesome photographic evidence provoked anger toward the defendant, it did not elicit anger toward the event itself. Only anger directed at the defendant mediated the effect of the gruesome evidence on judgments of guilt.

Considering the quality of the studies, the six studies that found no significant mediation of anger are of higher quality than the study by Douglas et al. (1997) which did report such mediation (of outrage and vengeance specifically). Findings from Bright and Goodman-Delahunty (2006) show that anger directed at the defendant – rather than at the event – has a mediating effect. Although a majority of studies suggests no mediating effect of anger, it seems to partly depend on the type of anger measured.

Sadness

Six studies examined whether sadness mediates the effect of gruesome evidence on decisions about guilt. Two studies found significant mediation by sadness (Douglas et al., 1997; Perez, 2016), while four studies did not (Bright & Goodman-Delahunty, 2006; Cush & Goodman-Delahunty, 2006; Edwards & Mottarella, 2014; Matsuo & Itoh, 2016).

Douglas et al. (1997) found that gruesome photographic evidence evoked sadness, which in turn led to stronger beliefs in the defendant's guilt. Similarly, Perez (2016) demonstrated that both photographic evidence and verbal descriptions of gruesome content increased guilty verdicts, with sadness mediating this effect. In contrast, the other four studies found no significant role for sadness in mediating the relationship between gruesome evidence and guilt judgments.

The study by Douglas et al. (1997), which found a mediating effect of sadness, is of lower quality. While Perez (2016) also reported a mediating effect and conducted a higher-quality study, the findings from the four other studies, including studies of similar quality, suggest otherwise. This leads us to conclude that sadness generally does not mediate the effect of gruesome evidence on guilt decisions.

General positive and negative affect

Two studies examined the role of general negative emotions in mediating the effect of gruesome evidence on guilt decisions, using photographic or a combination of photographic and auditory evidence. Neither study found that general negative emotion increased or mediated the effect of gruesome evidence on guilt (Douglas et al., 1997; Edwards & Mottarella, 2014). Similarly, no significant results were found for positive emotions, such as interest, curiosity, or surprise (Perez, 2016), nor for general positive

affect (Edwards & Mottarella, 2014). General affect — whether negative or positive — thus does not mediate the effect of gruesome evidence on guilt decisions.

Other emotions

Several studies have examined the role of other emotions, such as sympathy or compassion (Bright & Goodman-Delahunty, 2006; Cush & Goodman-Delahunty, 2006; Douglas et al., 1997), guilt feelings (Edwards & Mottarella, 2014), and feelings of stress, disturbance, or shock (Douglas et al., 1997; Thompson & Dennison, 2004). However, none of these studies found significant mediating effects of these emotions on the relationship between gruesome evidence and guilt decisions.

Discussion

This systematic literature review provides an overview of studies investigating emotion as an underlying mechanism in the effect of gruesome evidence on guilt decisions. It distinctly focuses on the mediating role of different emotions, an area not thoroughly explored in previous reviews or meta-analyses (e.g. Grady et al., 2018).

A mediating effect of emotion on guilt decisions was found in five studies (Bright & Goodman-Delahunty, 2006; Douglas et al., 1997; Salerno, 2017, Study 1 and 2; Perez, 2016), while four studies found no mediating effect (Cush & Goodman-Delahunty, 2006; Edwards & Mottarella, 2014; Matsuo & Itoh, 2016; Thompson & Dennison, 2004). The results of this systematic review further highlight the importance of examining specific emotions, as not all emotions were (equally) triggered by gruesome evidence, as further discussed below.

Three high-quality studies showed that disgust, triggered by gruesome photographs, mediated guilt decisions. In these studies, the more disgusting participants found the evidence, the more likely they were to render a guilty verdict. In contrast, fear-related emotions (e.g. fear, anguish, or anxiety), and general negative or positive affect were found to have no mediating effect. Studies on sadness and anger paint a similar picture, as the majority of studies do not support a mediating effect. For anger, the findings are in contrast with previous research and theory that suggest a role for anger in decision-making. A possible explanation might lie in the different anger types measured; mediating effects were found only for experienced outrage, vengefulness, and anger directed at the defendant (in two studies), but not for 'anger' as such or directed at the wrongful event (in six studies). Looking at the action tendency of anger – which is aimed at rectifying wrongs (Darley & Pittman, 2003; Frijda, 1988; Van Doorn et al., 2014) – judging guilt might be too abstract an action compared to concrete behaviors like retaliation or punishment. Anger might more consistently influence decision-making when the outcome involves direct punitive measures. These findings underscore the importance of focusing on specific emotions in research, as different emotions drive different behaviors (Zeelenberg et al., 2008). For example, disgust may lead to distancing, while anger is more likely to motivate action (Roseman et al., 1994). Overall, we conclude that the effect of gruesome evidence on guilt decisions is primarily driven by disgust, while fear, sadness, and anger play less prominent roles.

Our results align with the appraisal tendency framework proposed by Lerner and Keltner (2000), which suggests that different emotions have distinct effects on judgment and decision-making. However, they do not support broader theoretical models such as the Affect Infusion Model (AIM) and emotion mood-congruent judgment (Forgas, 1994), or Alicke's (2000) culpable control model. These general models predict that strong negative emotional stimuli, such as anger, sadness, fear, or disgust, would bias judgments toward a guilty verdict. Instead, our findings suggest that only disgust has a significant impact, while general negative or positive emotions do not appear to influence guilt decisions.

It is likely that the studies reviewed have underestimated the influence of emotion on guilt decisions because they were all conducted using mock jurors, who simulate the role of real jurors. However, mock jurors make decisions without the weight of responsibility that real jurors carry; completing a questionnaire is very different from deciding the fate of a defendant in a real trial. In actual criminal trials, gruesome evidence may have a stronger emotional impact. Moreover, real juries engage in deliberation, a process that can lead to deeper discussion among jurors or judges (Maroney, 2011; Van Stokkom, 2003). On the one hand, deliberation might reduce the undesirable effects of emotion by encouraging more rational decision-making (Haidt & Bjorklund, 2008). On the other hand, jurors may cling to their initial judgments and attempt to sway others, potentially intensifying emotional effects through emotional contagion (Peter-Hagene et al., 2019). Therefore, individual juror decisions can differ significantly from group decisions. While the current review did not address a potential 'deliberation effect,' this remains an important avenue for future research.

More broadly, this raises several methodological concerns about studies on emotion and legal decision-making. One key issue is the lack of ecological validity due to the reliance on mock juries and student samples (Dhami & Belton, 2017; Konecni & Ebbesen, 1992). Additionally, the use of abridged case materials and how emotions are defined and measured also require careful consideration (e.g. Głomb, 2022). Many studies reviewed here present participants with a list of emotions without defining them, assuming that the labels are self-explanatory. Even though validated scales like the POMS, PANAS, and JUNAS are used, these scales often include a wide range of states — such as self-assurance, attentiveness, and stress — that are categorized under 'emotion.' The rationale for including such a broad array of terms is rarely well-theorized, complicating attempts to draw overarching conclusions about the influence of emotion. This lack of clarity also hampers a more nuanced reflection on the theoretical implications of the findings.

Furthermore, most of the studies included in this review focus on photographic representations of gruesome evidence. This may explain why disgust frequently emerges as a key mediating factor, since photographic evidence is often more vivid and confrontational than written descriptions, making it more likely to provoke disgust. Although written descriptions can evoke vivid mental images, direct visual depictions offer a more immediate and unfiltered view of the disturbing content. Research by Berretz et al. (2023) found that participants reported higher levels of disgust when exposed to naturalistic, vivid stimuli compared to pictorial representations. Similarly, visual evidence is likely to trigger stronger disgust reactions than merely imagining a scenario described in writing. Only one study (Bright & Goodman-Delahunty, 2006) directly compared the

impact of written and visual evidence, and found that gruesome images were more influential on jurors' verdicts than written descriptions. Perez (2016) combined verbal and photographic evidence but did not compare the two modalities. Thus, comparisons between different types of evidence — written, auditory, and visual — are scarce. Although earlier research suggested that visual and auditory evidence might have a greater emotional impact due to their vividness compared to written formats (Bell & Loftus, 1985), the lack of such comparisons in the literature hampers our ability to draw firm conclusions about how the presentation of gruesome evidence influences emotion and verdicts.

This comparison between presentation modalities is particularly relevant given the advancements in visual and auditory technologies since the early 2000s, in which some of these studies were conducted. Modern graphics and presentation techniques can create more vivid experiences, potentially enhancing emotional responses and affecting verdicts. This highlights the need for updated research to explore how these technological developments influence both emotion and legal decision-making.

Limitations

This review faces several limitations. Firstly, the inclusion criteria were restricted to published empirical articles in English, meaning that unpublished studies, gray literature, and non-English research were not considered. This selection may have resulted in an incomplete representation of the full scope of scientific literature. Additionally, systematic differences between published and unpublished studies can introduce bias, as studies with negative or non-significant results are less likely to be published (Ahmed et al., 2012; Petticrew & Roberts, 2008). Including non-English studies could provide cross-cultural comparisons, allowing to explore how different judicial systems (e.g. common law vs. civil law) and cultural factors related to emotion influence decision-making.

Another limitation relates to the quality assessment of the included studies. Some studies were rated as being of low quality. Nevertheless, we chose not to exclude any studies based solely on quality scores, as the already small number of studies would have made it difficult to draw any meaningful conclusions. Instead, the quality assessments were used to carefully weigh the (sometimes conflicting) findings.

Additionally, this review does not include a meta-analysis, a choice made for several reasons. First, our aim was to provide a general overview of the role of emotion as a mediating mechanism, while also critically evaluating the methodologies of the studies. Unlike meta-analyses, which focus on quantifying effect sizes (Petticrew & Roberts, 2008), we sought to develop a broader understanding of how emotion influences the effect of gruesome evidence on guilt decisions. Moreover, conducting a meta-analysis would have been difficult due to the diverse emotion measures, variables, and small sample sizes across the included studies (Hernandez et al., 2020).

Implications and future directions

To better understand how emotions evoked by gruesome evidence influence guilt decisions, more research is needed using representative samples, ideally involving real judges and juries, while accounting for the role of deliberation among jurors. The latter

entails that group-decision making research should be integrated with emotion research (Peter-Hagene et al., 2023), focusing not only on guilt decisions but also on sentencing and other outcomes. Moreover, the effects of gruesome evidence on other criminal justice actors, such as police officers, should also be examined. Gruesome evidence can affect the emotions of interrogators, potentially influencing decisions made during interrogations and throughout the case (Verhoeven et al., 2020).

Given that current research suggests that gruesome evidence may lead to more guilty verdicts due to the emotions it elicits, its use in legal practice is worth questioning. A conviction should not hinge on how disgusting the evidence is perceived. For example, a close-up photo of a gunshot wound (more gruesome) versus a photo from a distance (less gruesome) still demonstrates the presence of a gunshot wound, independent of the burden of proof. Yet, a prosecutor seeking to increase the chances of conviction might opt for the more graphic image. Thus, more gruesome evidence may not directly contribute to the objective truth but could bias decisions by evoking strong emotional reactions.

Legal actors — police, prosecutors, judges, jurors, and lawyers — should be aware that the gruesomeness of evidence can influence decision-making. This does not mean that all evidence must be sanitized, but it's essential to recognize the impact of how evidence is presented. For instance, is an autopsy photo necessary to convey the severity of a wound, or would a less graphic representation, like a description, drawing, or a 3D model suffice? While all these formats can convey the same fact, the emotional impact of an autopsy photo is far greater. This underscores the need for clear guidelines on how visual evidence should be presented in case files and trials. These guidelines should go beyond simply instructing jurors to disregard their emotions (which we would argue is not even possible), as ignoring emotions does not necessarily lead to more neutral decision-making (Maroney & Gross, 2014).

In some common law countries, such as the U.S. and Canada, certain evidence can be excluded if it provokes excessive emotional reactions that outweigh its probative value (Federal Rule of Evidence, Rule 403). When evidence is deemed prejudicial, courts may present it to the jury in a less provocative manner. However, these standards do not offer clear guidelines on what is 'too gruesome.' Scholars have highlighted the complexity of determining whether the probative value of evidence (i.e. the relevant information it provides) outweighs its potential prejudicial impact (Douglas et al., 1997; Salerno, 2017).

Finally, this review points to the importance of discussing emotion regulation strategies for professionals who must deal with gruesome evidence. Previous research has focused on recognizing the biasing effects of emotional evidence, but little attention has been paid to managing the emotions experienced by decision-makers (and the (impossible) ideal of being a dispassionate judge; Maroney & Gross, 2014). The challenge is finding ways for legal professionals to make emotion-informed decisions without bias, while also allowing for emotion regulation.

Conclusion

This review shows that the experience of emotions elicited by gruesome evidence can impact guilt decisions, but that it depends on the type of emotion experienced: disgust seems to show a mediating effect, whereas fear-related emotions, and general positive

and negative affect do not. Studies on sadness and anger-related emotions paint a similar picture, as the majority of studies do not support a mediating effect, although the effect of anger seems to partly depend on the type of anger measured. The current systematic review further highlights methodological concerns, such as the limited use of representative samples and the ambiguity in the definition of ‘emotion’. Future research should adopt a more nuanced approach in studying emotional mechanisms in legal decision-making, which could help clarify whether gruesome evidence should be used in legal practice.

Notes

1. Simmons et al. (2018) set the minimum required number of participants in experimental research at at least fifty participants per condition. An experiment with a small sample size exposes subjects to potential harm (i.e., the confrontation with gruesome evidence) without yielding reliable results (Lenth, 2001). That is why the limit of at least fifty participants per condition is also used in the current quality assessment. If the study does not explicitly specify group size per condition, the following guideline is used for evaluation, so that an approximate adequate sample size can be determined: the total number of participants divided by the number of conditions.
2. The Juror Negative Affect Scale (JUNAS) was constructed by combining items on three subscales (anger, fear/anxiety, and sadness) from the Profile of Mood States (POMS) and the Positive and Negative Affect Scale (PANAS).

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