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Jurors' Emotional State, Attentional Focus, and Judicial Judgment in a Criminal Court

Catherine Esnard*

Centre de Recherches sur la Cognition et l'Apprentissage (CeRCA), Université de Poitiers,
Université de Tours, CNRS, Poitiers, France

Nicolas Vibert

Centre de Recherches sur la Cognition et l'Apprentissage (CeRCA), Université de Poitiers,
Université de Tours, CNRS, Poitiers, France

* Corresponding author

Phone: 33 (0)5 49 45 47 27

Address: MSHS

5, rue T. Lefebvre - TSA 21103

F - 86073 Poitiers cedex 9

France

Mails address: catherine.esnard@univ-poitiers.fr

ORCID : <https://orcid.org/0000-0003-4637-799X>

Abstract

In order to consider the relevant relationships between emotion, information processing and judicial judgment, this study evaluated the impact of positive (amusement), negative (sadness) or neutral mood induction on 128 mock jurors' visual attentional focus, as measured by their eye fixations on the face of a witness filmed while giving testimony in a criminal court. Participants then rated their perceptions of the witness's and their own emotions on the Differential Emotional Scale, before indicating their final judicial judgment. As expected, results showed that sadness can favor information processing in a more effortful mode, with more steady visual attention, while a positive emotional state such as amusement can favor information processing based more on the witness's emotions, a source of useful clues for establishing the judicial judgment. These results are discussed in relation to how the cognitive approach can shed light on the processes underlying judicial judgment.

Keywords: emotional state, emotional facial expression, visual attention, judicial judgment

Jurors' Emotional State, Attentional Focus, and Judicial Judgment in a Criminal Court

In the French Assize Court¹, where criminal cases are tried, lay jurors are exposed to multiple items of information with a strong emotional content. Moreover, all the parties involved (i.e., magistrates, lawyers, experts and witnesses) address the jurors in a bid to convince them of the merits of their arguments. Testimonies create a context that is ripe for the formation of individual impressions that are liable to guide jurors' judicial judgments, in favor of either the prosecution or the defense, which are subsequently expressed during collective deliberation. The judicial judgment is thus a particular type of decision-making task that involves a complex judgment requiring strong cognitive and motivational resources. A large body of literature in the field of social and cognitive psychology applied to judicial decision-making shows that this context fosters distorting factors (e.g., stereotypes) that damage the quality and validity of lay jurors' judgment (Devine, Clayton, Dunford, Seying, & Pryce, 2001; Rainis, Alain, & Denève, 2004). The emotional content of victims's impact statements sometimes evoke strong emotions that can affect mock jurors (Nunez, Estrada-Reynolds, Schweitzer, & Myers, 2016) and lead to decisions based on emotion rather than reason (Bandes, 2009 ; Myers, Weidemann, & Pearce, 2006). From a legal perspective, the ideal judgment should be entirely dispassionate, so emotions can also be seen as distorting jurors' judgments.

Emotions such as anger can increase judgments of responsibility and blame (Feigenson, 2010; Feigenson & Park, 2006; Forgas, 2010; Nuñez, Schweitzer, Chai, & Myers, 2015; Nuñez , Myers, Wilkowski, & Schweitzer,2017). The emotions triggered by the intrinsic characteristics of the cases being judged may interact with the jurors' emotional

¹ One of the features of civil law legal systems is the mixed jury, made up of both lay and professional judges (i.e., *jurors* and *magistrates*). A cursory review of the various types of lay participation shows that mixed courts differ across European criminal justice systems based on civil law. In French Assize Courts, where criminal cases are tried, three professional judges (the president of the court and two assessors) sit alongside six jurors at first instance level, and nine jurors at appeal level.

states prior to the decision-making situation (Feigenson, 2016). Recent research conducted from an emotion regulation perspective (Maroney & Gross, 2014) indicates that instead of trying to neutralize their emotions, jurors should learn to manage their emotional states. In this regard, studies addressing the relationships between emotion, cognition, and judicial judgment are of particular interest. There has been considerable research on the relationship between emotion and legal heuristics or systematic information processing. Other studies have focused on the relationship between emotional states and visual attention control, concentrating in particular on the perception of facial expressions. However, there has been little research on the joint effects of jurors' emotional states on visual attention control, the perception of witnesses' emotional facial expressions (EFEs), and the orientation of jurors' judgments. Thus, the main goal of the present study was to assess whether jurors' emotional states influence the way they process information, by modulating their visual attention to a witness's EFEs and their perception of the witness's emotions, and whether this may consequently orient their judicial judgment.

Impact of Positive Versus Negative Emotional States on Legal Information Processing

Emotions are short-lived and intense emotional responses to events of major importance. They influence the content of our thoughts, as well as the way we process information. The same is true for moods, which are more diffuse affective states, often low in intensity. Their origin is more difficult to identify, and they can last for longer. Many studies (for a review, see Fredrickson, 2001) have shown that these emotional experiences, which fall into the category of emotional states (Dalle & Niedenthal, 2003; Krauth-Gruber & Ric, 2000), can have different effects on information processing. According to the affect infusion model (Forgas, 1995), a positive mood, as opposed to a negative one, leads to more superficial processing of case evidence and less steady attention, as well as to a more global perception, where details are given less consideration (Fiedler & Bless, 2000; Isen & Daubman, 1984;

Isen & Means, 1983; Park & Banaji, 2000). According to the hedonic perspective, this superficial processing is conducive to maintaining a pleasant state, as it avoids having to encounter other sources of information that might modify this state (Wegener, Petty, & Smith, 1995). Sad people engage in more elaborated and effortful processing, in an effort to repair their mood by being more accurate (Schwarz & Clore, 1996). From a similar, informational perspective, a positive emotional state informs individuals that their environment is sufficiently safe and they therefore do not need to analyze their surroundings more carefully (Bless, Clore, Schwarz, Golisano, Rabe, & Wölk, 1996). A negative emotional state informs us of a problem and therefore commits us to processing the environmental data in order to manage this problem and regain a positive emotional state. Finally, according to cognitive evaluation theories, the perceived controllability of the situation directs information processing. Thus anger, like joy, is associated with a situation perceived of as certain and that therefore does not require individuals to engage in thorough processing of the information (Ortony, Clore, & Collins, 1988), whereas fear or sadness are associated with a situation perceived of as uncertain (Tiedens & Linton, 2001).

Most experimental studies of legal decision-making have confirmed these findings. Thus, Bodenhausen, Kramer, and Süsner (1994) showed that a joyful emotional state, compared with a neutral one, fosters superficial, stereotypical processing, and therefore leads to more severe judgments if the target belongs to a stereotypical group that is relevant to the purpose of the judgment. This reliance on stereotypes under a positive mood can nevertheless be thwarted if specific information about the case clearly contradicts the stereotype (Krauth-Gruber & Ric, 2000). By contrast, a negative mood leads to closer consideration of the specific data of the situation (Bless, 2000). For instance, mock jurors experiencing a sad emotional state following emotional testimony more accurately identified inconsistencies in the testimony than mock jurors who were in a neutral emotional state, indicative of more

systematic information processing (Semmler & Brewer, 2002). However, according to appraisal theory (Lerner & Tiedens, 2006; Ellsworth & Dougherty, 2016), different negative emotional states can have different effects on legal judgments.

Instead of looking at negative and positive emotions, much research focused on different types of negative emotion, as anger, sadness, fear and sometimes disgust (Salerno & Peter-Hagene, 2013), because negative emotions are more frequently experienced during a trial than positive emotions (Estrada-Reynolds, Schweitzer, & Nuñez, 2016). Sadness was recently shown to be the most common negative emotion expressed in victim impact statements and appears to be more pervasive than anger (Myers, Nuñez, Wilkowski, Kehn, & Dunn, 2018). Most research on the emotional effects of victims' s impact statements on mock jurors suggest that sentencing judgments are likely to be influenced, but only when the jurors are angry, and not when they are sad (Nuñez, Schweitzer, Chai, & Myers, 2015; Nuñez, Myers, Wilkowski, & Schweitzer, 2017). However, a recent study based on a sample of 192 capital trial victim impact statements transcripts analysed for the linguistic content of their emotionality shows that sadness could also be a predictor of severe punishment (Myers et al., 2018). In summary, the question of the effects of sadness, especially of its differential effects compared to those induced by anger, is relatively well documented in terms of both its impact on the processing of evidence (Bodenhausen, Sheppard, & Kramer, 1994; Tiedens & Linton, 2001) and its effects on judicial judgments (Nuñez, Estrada-Reynolds, Schweitzer, & Myers, 2016). However, to our knowledge, no study has specifically addressed the differential effects of such opposite emotional states as sadness and amusement. While it is unlikely that amusement is an emotion that is experienced frequently in a criminal trial, the jurors themselves may be in a personal, positive emotional state. Consequently, the main goal of this study was to analyse the impact of sadness induction among jurors compared to a positive emotional state, i.e., amusement. Secondly, several authors recommend to consider, on top of

verbal statements, more "subtle" factors that convey emotions, such as the facial expressions of witnesses during their depositions (Myers et al., 2018).

Emotional States, Visual Attentional Focus, and Perception of Emotional Facial Expressions

If emotional states influence the way we process information, then presumably they also have an impact on how we attend to our environment. Numerous studies have revealed that emotional states determine the degree of attentional focus on relevant information in decision-making tasks. The common view is that positive affect generates a broader attentional focus, and negative affect a narrower one (Fredrickson & Branigan, 2005; Gasper, 2004; Gasper & Clore, 2002). The visual search tasks used to investigate whether the mechanisms underlying visual selective attention are modulated by observers' mood are often derived from traditional flanker tasks, designed to measure the ability to focus on meaningful information and resist distractors. Several studies in which the target-defining features varied across trials have shown that distractors have a significantly stronger impact on reaction times under negative mood induction than under positive or neutral mood induction. In other words, negative mood induction increases the processing of peripheral details and therefore the reporting of information (Gruber, Schmid, & Krummenacher, 2012; Wegbreit, Franconeri, & Beeman, 2015). Other studies have suggested that negative emotional state affects attentional scope, providing more informative clues about what is happening in the visual scene (Huntsinger, 2012). More specifically, these effects have been observed during the detection of EFEs, which are regarded as a very important source of social information (Keltner et al., 2003), particularly the emotion conveyed by the eyes (Emery, 2000). During face perception, happy individuals are more likely to focus their attention on people's eyes than sad individuals, who tend to avoid eye contact in social situations and experimental settings (Hills & Lewis, 2011). However, in these experimental settings, sad-induced participants are better

able to discriminate changes in head shape than happy-induced participants are. Hence, people in a positive mood are not necessarily concentrated when they focus their attention on people's eyes, whereas sad people are more likely to detect specific people's features. In other words, focusing on the eyes prevents happy-induced participants from detecting evidence that is more discreet. As Hills and Lewis (2011) point out, happy people's fixations on other people's eyes may be due to a need for social categorization via the gaze, allowing faster interaction (Macrae, Hood, Milne, Rowe, & Mason, 2002). Another interpretation put forward by Hills and Lewis (2011) is that the induction of happy moods may have caused an overall increase in wakefulness levels, which may cause participants' inability to turn their attention away from the target's eyes.

According to these previous findings, the emotional states of observers should impact their EFE processing by modifying the way they detect, identify and focus their attention on different facial features. This adaptive and automatic process directs observers' attention to the regions of the face that are considered to be the most informative, such that these regions receive more fixations than those assessed as less instructive (Henderson, Weeks, & Hollingworth, 1999). This raises the question of the extent to which attention to EFEs is conditioned by the observers' emotional states, which may well influence their EFE perception and, consequently, their decision-making.

Emotional Facial Expressions and Orientation of Judicial Judgment

According to the affect-as-information model (Clore, Schwarz, & Conway, 1994; Damasio, 1994), people may interpret their emotional states as direct information about the target of their judgment. However, several studies have shown that observers' emotional states are prone to interference from their targets' emotional states, and more particularly their EFE valence. According to the embodiment effect (Bush, Barr, Mchugo, & Lanzetta, 1989; Niedenthal, Brauer, Halberstadt & Innes-Ker, 2001), EFE interpretation is linked to an

automatic imitation process that allows the observer to intimately feel the emotion felt by another person, which facilitates emotion recognition (Hatfield, Bensman, Thornton, & Rapson, 2014; Hatfield, Cacioppo, & Rapson, 1993). Thus, mood congruence seems to be important for stimulus detection (Rokke & Lystad, 2015), but the interrelation between emotional state, attention and local processing of emotional faces remains a complex issue. Mokhatari and Buttle (2015) have pointed out the need to take into account elements such as the duration of the mood experience, the mood induction techniques and the specificity of the task. Based on musical mood inductions, these authors have shown that a negative facial expression, compared to a positive one, can effectively lead to a better treatment of the local characteristics of faces. This local treatment was altered following the induction of a happy mood rather than a sad mood, but this was only observed when the induced mood, whether sad or happy, was prolonged for a long time. In other words, the observer's emotional states have an impact on visual processing, but this impact depends on the duration of involvement in the mood.

To our knowledge, no research has experimentally looked for these effects of jurors' emotional states on local processing of witnesses' EFEs, and consequently on the construction of judicial judgments. The only available research concern facial stereotypes influence on criminal judgments. In particular, judgments of guilt or innocence were shown to be mediated by the extent to which the defendant's face matches the criminal stereotype for that particular case (Macrae & Sheperd, 1989). Moreover, according to the emotion-congruency effect (Keltner, Ellsworth, & Edwards, 1993), an angry emotional state may reduce the depth of processing, leading to greater reliance on stereotypes, which may amplify blame if the target's behavior is stereotype-consistent (Bodenhausen, Sheppard, & Kramer, 1994). However, this research do not approach information processing from the perspective of visual attention to witnesses' EFEs. Witnesses, just like lawyers and magistrates, are powerful sources of

influence for the formation of impressions by the jurors who will have to make the final legal judgment. Jurors' eyes fixations on witnesses' faces are objective indications of their degree of concentration on the target faces, which, due to their emotional components, are potentially very informative. Based on pre-existing research, the present study assumes that the jurors' emotional states modulate their visual attention to witness' EFEs and influence the way they process the associated emotional information. However, to our knowledge, no study sought to find out to what extent this interaction between the jurors' and witnesses' emotional states, mediatized by the jurors' visual attention, may guide legal decision-making. From an applied perspective, this question is interesting for the judicial procedure based on the intimate conviction instruction². This decision rule, which is based on impression formation and moral certainty, is used in mixed courts of lay and professional judges in many civil law systems (close to the instruction that the decisions must be taken "beyond a reasonable doubt" in the Common Law legal tradition). The intimate conviction principle guides the judges in their assessment of the evidence (e.g., expert reports, witnesses' testimony), from the initial sessions of the assize court to the deliberation. Recent experimental studies (Dumas & Esnard, 2019, Esnard & Dumas, 2019a) tested the impact of the intimate conviction instruction on legal evidence processing. These authors showed, via a qualitative study based on the systematic analysis of 60 interviews conducted among professional judges, jurors and layperson, that jurors, contrary to magistrates, highlight the importance of the subjective and emotional experience associated with the construction of the intimate conviction involved in judicial decision-making (Esnard & Dumas, 2019b). In this perspective, the aim of study was to explore the relevant relationships between emotion, information processing and judicial judgment.

² The intimate conviction instruction, one of the features of legal systems based on civil law, governs the decision-making process in most continental judicial systems (e.g., France, Germany and Belgium). This instruction refers to a decision principle whereby magistrates and jurors have "to question themselves in silence and reflection and to seek in the sincerity of their conscience what impression has been made on their reason by the evidence brought against the accused and the arguments of his defense" (Article 353 of the French Code of Criminal Procedure).

In summary, the more information needs to be processed in order to make a judgment, the more jurors' mood comes into play and affects their judgment. We therefore investigated how mock jurors' emotional states affect their attentional focus and, by so doing, their judicial judgments.

First, in accordance with the affect infusion model (Forgas, 1995) and previous experimental results about positive versus negative emotional states and information processing, we predicted that the sadder the mock jurors' induced emotional state, the more they would process the information. Hence, they would pay more steady visual attention to the scene with a narrower attentional focus, resulting in less scanning of the visual scene, and more and longer fixations on the target's face (H1).

Second, we expected the mock jurors' emotional states to influence their perception of the target's EFE. The sadder the mock jurors' emotional state, the less they would search for easily accessible information through the target's EFE, and the less permeable they would be to the target's emotions (H2).

Third, according to previous studies, which showed that mock jurors experiencing a sad emotional state were more engaged in thorough processing of information and more accurately identified inconsistencies in emotional testimony, we expected that sadness of the mock jurors would influence their judgment in the sense of taking greater account of contradictory evidence. In this perspective, the sadder the mock jurors' emotional state, the more likely their judgment would be in favor of defense (H3).

Method

Participants and Design

A total of 128 first-year psychology undergraduates (90 women, 38 men; $M_{\text{age}} = 20.02$ years, $SD = 3.2$, range: 17-44) from the Université de Poitiers (France) took part in the study

in exchange for a course credit. The design was a one-factor (positive: amusement vs. negative: sadness vs. neutral mood induction) between-participants design. Participants were randomly assigned to one of the three conditions.

Procedure and Material

Participants were individually greeted in the laboratory. They signed the consent form, provided their age, and were seated in front of a TV screen. They were then told that the experiment had two distinct parts. First, they were told that the objective was to find out whether a person's mood can affect their degree of memorization. Each participant completed the Brief Mood Introspection Scale (BMIS; Mayer & Gaschke, 1988; French translation by Dalle and Niedenthal, 2003), and watched one of three mood induction video sequences, after being instructed to memorize as many elements in it as possible.

The three mood induction videos, which each lasted 10 minutes, were compilations of movie extracts taken from a database of 64 movie sequences coded according to their degree of emotional arousal for six types of emotion (amusement, tenderness, sadness, anger, fear, and disgust) and neutral (Schaefer, Nils, Sanchez & Philippot, 2010). The positive mood induction video contained sequences high on the amusement dimension, the negative mood induction video sequences high on the sadness dimension, and the neutral mood induction video sequences high on the neutral dimension. At the end of each video, each participant completed the BMIS again.

Second, in accordance with the mock jury paradigm (Bornstein, 1999), participants were asked to take on the role of jurors in a criminal court, which implied that they would have to give a legal decision. After reading factual information about the trial (six slides that gave the defendant's identity, his socio-professional profile, the charges and the circumstances of the occurrence of the acts for which the defendant was charged) on a PC screen, they sat in front of a Tobii TX 300 eye-tracker screen and the experimenter carried out

the eye-tracker calibration phase. For 6 minutes, each participant then watched the same video extract based on Esnard, Dumas, and Bordel (2013)'s experimental material. This was an extract of a witness filmed while giving testimony in a French criminal court in an appeal hearing for a murder charge. In France, the Act of 15 June 2000 allows a case to be re-judged in its entirety by the appeal court, thus obviating the need to rely on the original decision. The defendant had already been found guilty once (negative preliminary information). In the original trial, the defendant had been sentenced to 10 years' imprisonment for attempting to murder his best friend when he found out that he was having an affair with his wife. For his appeal, the defendant did not deny the facts. Thus, the judgment did not concern the defendant's culpability but rather his intentionality, mitigating circumstances, and the potential revision of the initial custodial sentence in the light of new testimony, notably from his ex-wife, Mrs P. This testimony was chosen for the present study because the jurors learned that Mrs P had simulated a scene of adultery in order to make her husband jealous. Mrs P expressed herself with embarrassment and hesitation, confessing that she was responsible for the tragedy. Consequently, exposure to this testimony, showing Mrs P's face in close-up (the whole video was zoomed up to the witness' face), might generate strong and possibly contradictory emotions among the mock jurors.

After watching the video extract from the trial, participants completed the Differential Emotional Scale (DES; Izard, Dougherty, Bloxom, & Kotsch, 1974) twice: first to evaluate their own emotions, and second to evaluate the witness's emotions. Half the participants began by evaluating their own emotions (condition A), and half by evaluating the witness's emotions (condition B). Then they completed the judicial judgment measures. Finally, participants were thanked and debriefed.

Measures

In the BMIS, participants were asked to rate their *emotional state* on a 4-point scale ranging from 1 (*Not at all*) to 4 (*Totally*) in relation to 16 adjectives. The emotional score ranged from 16 (most negative mood) to 64 (most positive mood). Participants were then asked to rate their general mood state on a 21-point scale ranging from -10 (*Very bad*) to +10 (*Excellent*). Four scores were computed for each participant: one emotional state score (ESS1) and one general mood score (GMS1) before exposure to the mood induction video, and one emotional score (ESS2) and one mood score (GMS2) after exposure to the mood induction video.

Participants' visual attention was measured using eye-tracking methodology that recorded the visual scanpath (saccades, fixation durations) in relation to a visual stimulus. The number and duration of eye fixations are typically used to measure the amount of visual attention paid to visual information. The most informative emotional details or regions of a scene are the ones that receive the most eye fixations. Eye-tracking also highlights what the observer did not look at versus what she or he fixated, sometimes unconsciously.

Participants' eye fixations on the video extract were recorded with a Tobii TX 300 eye-tracker. The Tobii plots participants' visual path via an infrared light camera. The external use of infrared eliminates external light variations and means that there is a fixed point in the image (corneal reflection of the source). The Tobii TX 300 (i.e. 300 Hz) records an eye movement every 3.33 ms with black pupil eye-tracking, which allows for a better contrast between pupil and iris and eliminates a number of problems, especially with regard to pale eyes, which are more difficult to capture. We computed two scores: the number of fixations, and the mean duration of fixations on the witness's face when she spoke from the vantage point of the witness box. Eye-tracking data also provided further evidence for the special nature of eyes in face perception. Henderson, Falk, Minut, Dyer, and Mahadevan (2001) observed that 90% of fixation time is spent on the eyes, nose and mouth, with the eyes accounting for no less than 60% of the total fixation time. We therefore defined two areas of

interest (AOIs): the witness's eyes, and the witness's nose and mouth. Finally, we compared the number of fixations and the mean duration of fixations on the eyes AOI, nose and mouth AOI, and outside the AOIs. We initially recruited 65 participants in the positive mood induction condition, 62 in the negative condition and 60 in the neutral condition, i.e., 187 participants. However, only the 128 participants with at least 70% validity of eye movement data (i.e., 50 participants in the positive mood condition, 40 in the negative condition and 38 in the neutral condition) were retained for further analysis.

Participants' own emotions after watching the witness video and their *perception of the witness's emotions* were both measured with the DES. Participants were asked to rate their emotional state on a 5-point scale ranging from 1 (*Not at all*) to 5 (*Totally*) in relation to 10 triads of adjectives. We chose to consider participants' scores on each triad of adjectives. Accordingly, for each participant, we produced two series of 10 scores, one for the participant's own emotions, and one for the witness's perceived emotions.

Participants' *judicial judgment* was measured with six items, each rated on a 10-point scale. They were asked to rate the defendant's intention to commit the crime on a scale ranging from 1 (*No intention at all*) to 10 (*Full intention to kill*), whether the defendant should benefit from mitigating circumstances on a scale ranging from 1 (*Not at all*) to 10 (*Totally*), and whether they deemed that Mrs P (the witness) was responsible for the events on a scale ranging from 1 (*Not at all*) to 10 (*Totally*). Second, participants were asked to rate their judgment orientation on a 15-point scale ranging from -7 (*Favorable to the defense*) to +7 (*Favorable to the prosecution*), and their level of confidence in their judgment about the witness on a 10-point scale ranging from 1 (*Not at all*) to 10 (*Totally*).

Results

Effects of Mood Induction (Manipulation Check)

[Insert Table 1 near here]

To test the effect of the mood induction, participants' ESS and GMS before and after the exposure to the mood induction video were analyzed using two-way ANOVAs with time as a within-participants factor and mood induction condition (negative, neutral or positive) as a between-participants factor (see Table 1). Effect sizes were computed as partial eta squares (η^2_p). As expected, both analyses revealed a significant interaction between the two factors ($F(2,125) = 19.67, p < .001, \eta^2_p = .239$ for the ESS, and $F(2,125) = 22.55, p < .001, \eta^2_p = .265$ for the GMS). Subsequent planned comparisons demonstrated that the three groups of participants did not significantly differ on either ESS1, (all $F_s(1,125) < 1.24, p > .26$), or GMS1, (all $F_s(1,125) < 1.23, p > .26$). As expected, the mood induction procedure had a significant impact on participants' ESS, which increased for PM participants ($F(1, 125) = 11.62, p < .001$), decreased for NM participants ($F(1, 125) = 26.93, p < .001$) and was not significantly modified for nM participants ($F(1, 125) = .87, p = .35$). As a result, the three groups of participants differed on ESS2, since PM participants' ESS2 was higher than NM participants' ($F(1, 125) = 12.09, p < .001$) and marginally higher than nM participants' ($F(1, 125) = 3.25, p = .074$). No significant difference was observed between NM participants' and nM participants' ESS2 ($F(1, 125) = 2.39, p = .12$). Similarly, the mood induction procedure had a significant impact on participants' GMS, which increased for PM participants ($F(1, 125) = 14.02, p < .001$), decreased for NM participants ($F(1, 125) = 31.52, p < .001$) and was not significantly modified for nM participants ($F(1, 125) = .04, p = .85$). As a result, the three groups differed on GMS2, since PM participants' GMS2 was higher than NM participants' ($F(1, 125) = 35.22, p < .001$) and marginally higher than nM participants' ($F(1, 125) = 3.65, p = .058$). In addition, NM participants' GMS2 was lower than nM participants' ($F(1, 125) = 14.01, p < .001$). We noticed that ESS and GMS were significantly, but rather slightly correlated both before (ESS1 and GMS1: $r = .20, p < .05$) and after EES2 and GMS2: $r = .32,$

$p < .001$) the mood induction procedure. In summary, as expected, the mood induction procedure did affect participants' emotional states, but differences were only observed between PM participants and NM and nM participants. Because it is based on a questionnaire that includes 16 different items, the Emotional State Score (ESS) is a more accurate measure than the overall General Mood Score, which is based on participants' answer to a single item. For this reason, we chose to test the hypotheses using linear regression analyses in order to estimate the effects of ESS2 on measured variables.

Effect of Mock Jurors' Emotional State on Their Visual Attention

[Insert Table 2 near here]

Linear regression analyses were used to estimate the effects of ESS2 on the eye-tracking measures (see Table 2). In addition, we carried out an a posteriori power analysis using the rules set out by Cohen (1988), which divides the effect sizes according to whether absolute value of correlation coefficient are small ($r = 0.1$), medium ($r = 0.3$) or large ($r = 0.5$), for the interpretation of all significant results.

ESS2 had a significant and negative effect on the number of fixations on the eyes AOI ($\beta = -1.71$, $SE = .82$, $t = -2.07$, $p < .05$, 95% CI [-3.33, -.08]) associated to a small effect size ($r = -0.18$), but not on the number of fixations on the mouth and nose AOI or the number of fixations outside the AOIs. Moreover, ESS2 had a significant and negative effect on the mean duration of fixations on the eyes AOI ($\beta = -.0068$, $SE = .0012$, $t = -5.58$, $p < .001$, 95% CI [-.0092, -.0043]) associated to a medium effect size ($r = -0.45$), the mean duration of fixations on the mouth and nose AOI ($\beta = -.0050$, $SE = .0014$, $t = -3.48$, $p < .001$, 95% CI [-.0079, -.0022]) associated to a medium effect size ($r = -0.30$), and the mean duration of fixations outside the AOIs ($\beta = -.0054$, $SE = .0011$, $t = -4.85$, $p < .001$, 95% CI [-.0076, -.0032])

associated to a medium effect size ($r = -0.40$). As expected, these results showed that the sadder the mock jurors' emotional state was, the longer the mean duration of their fixations both on and outside the AOIs. In other words, a sad emotional state decreased mock jurors' scanning of the visual scene and increased their attentional focus on the witness's face and, more generally, on the whole video.

Effect of Mock Jurors' Emotional State on Emotions Felt and Perceived During the Witness Video

Effect of mock jurors' emotional state on emotions felt during the witness video.

[Insert Table 3 near here]

Linear regression analyses were used to estimate the effects of ESS2 on the ratings of the 10 emotions felt by participants while watching the witness video (see table 3). The effect of ESS 2 was only significant on two of the 10 emotions measured with the DES. The sadder mock jurors' emotional state was, the more attentive to the testimony ($\beta = -.021$, $SE = .009$, $t = -2.37$, $p < .05$, 95% CI [-.039, -.003]), small effect size : $r = -0.21$) and the less anxious ($\beta = .025$, $SE = .010$, $t = 2.43$, $p < .05$, 95% CI [.005, .046], small effect size : $r = 0.21$) they declared themselves to be.

Effect of mock jurors' emotional state on witness's perceived emotions during the witness video.

[Insert Table 4 near here]

Linear regression analyses were used to estimate the effects of ESS2 on the ratings of the witness's 10 emotions perceived by the participants while watching the witness video (see Table 4). ESS2 had a positive and significant effect on six of the emotions measured with the DES. The sadder the mock jurors' emotional state, the less the witness was perceived to be attentive ($\beta = .024$, $SE = .010$, $t = 2.29$, $p < .05$, 95% CI [.003, .043], small effect size : $r = 0.20$), sad ($\beta = .055$, $SE = .010$, $t = 5.56$, $p < .001$, 95% CI [.036, .075], medium effect size : $r = 0.44$), afraid ($\beta = .028$, $SE = .010$, $t = 2.82$, $p < .01$, 95% CI [.008, .048], small effect size : $r = 0.24$), anxious ($\beta = .077$, $SE = .012$, $t = 6.40$, $p < .001$, 95% CI [.053, .100], large effect size : $r = 0.50$), disgusted ($\beta = .026$, $SE = .009$, $t = 2.97$, $p < .01$, 95% CI [.009, .044], small effect size : $r = 0.26$), and surprised ($\beta = .021$, $SE = .008$, $t = 2.54$, $p < .05$, 95% CI [.005, .038], small effect size : $r = 0.22$).

Effect of Mock Jurors' Emotional States on Their Judicial Judgments

[Insert Table 5 near here]

Linear regression analyses were used to estimate the effects of ESS2 on the judicial judgment measures (see Table 5). The effects of ESS2 on the defendant's mitigating circumstances and participants' confidence in their judgment about the witness were not significant. However, ESS2 had a significant positive effect on participant's judgment orientation ($\beta = .117$, $SE = .025$, $t = 4.72$, $p < .001$, 95% CI [0.068, 0.167]), associated to a medium effect size : $r = 0.39$) in that the sadder the mock jurors' emotional state, the less they declared themselves to be favorable to the accusation. In addition, several results underlined the consistency of the mock jurors' judicial judgment. There was a significant negative correlation between **their judgments on the** defendant's intention to commit the crime and on his mitigating circumstances ($r = -.31$, $p < .05$), and a significant positive correlation between **their assessments of the witness'** responsibility and of the defendant's mitigating

circumstances ($r = .35, p < .01$). The two dimensions of judicial judgment were positively correlated with participants' confidence in their judgment about the witness (estimation of witness's responsibility: $r = .38, p < .001$; and defendant's mitigating circumstances: $r = .22, p < .05$). However, participants' confidence in their judgment about the witness was not correlated with their judgment orientation.

Discussion

The present study evaluated the impact of inducing positive (amusement), negative (sadness) or neutral emotional states on mock jurors' visual attentional focus, as measured by the number and duration of their fixations on the face of a witness filmed while giving testimony in a criminal court. The objective was to explore the way that the mock jurors processed their perceptions of the witness's emotions, and whether this consequently swayed their judicial judgments. In accordance with Hypothesis 1, results showed that the sadder the mock jurors' emotional state, the longer the mean duration of fixations both on and outside the witness's face. In other words, a positive emotional state increased mock jurors' scanning of the visual scene, rendered their visual attention less steady, and broadened their attentional focus, suggesting that they processed information in a superficial mode. In parallel, sadness decreased mock jurors' scanning of the visual scene, made their visual attention more steady, and narrowed their attentional focus, suggesting that they processed information in a more effortful mode. Hypothesis 2 predicted that the sadder the mock jurors' emotional states, the less they would treat the target's emotions (via EFEs) as relevant information. Results showed that the sadder the mock jurors' emotional state, the more attentive they were to the testimony but the less anxious they were. Moreover, results showed that the sadder the mock jurors' emotional state, the less the witness was perceived to be attentive, sad, afraid, anxious, disgusted and surprised. In others words, under positive emotional state, mock jurors' anxiety appeared to reflect their emotional empathy toward the witness. The more positive the mock

jurors' emotional state, the more permeable they were to the target's emotions. Conversely, we can interpret these results as follows: the more negative the mock jurors' emotional state, the longer their mean fixations both on and outside the witness's face, the more they engaged in elaborated and effortful information processing, and the more they processed the complexity of the testimony regardless of emotional empathy. As predicted by Hypothesis 3, results showed an effect of mock jurors' emotional state on the direction of their judgment in relation to the target's emotions. The sadder the mock jurors' emotional state, the more pro-defense they were. However, this orientation of their judgment appears to have been based on an overall impression, and was not consistent with the characteristics of the accused, such as the intentionality of the criminal act and any mitigating circumstances. This can be explained by the fact that the defendant was not seen by the participants, who were only shown the video of the witness testimony. However, the more pro-accusation the mock jurors, in terms of mitigating circumstances, the more they perceived the witness to be responsible for the events that led the defendant to commit the criminal act, and the higher their level of confidence in their judgment about the witness.

In summary, when they were in a sad emotional state, the mock jurors could process information in an effortful mode, with more steady visual attention. When they were in a positive emotional state, information processing was based on the witness's emotions, which in this case happened to be against the defendant. Positive emotional states therefore appeared to favor emotional empathy with the witness's testimony, a source of useful clues for establishing the judicial judgment. This judgment was therefore based on an overall impression, in accordance with the legal requirement of intimate conviction (Esnard & Dumas, 2019).

While these results were consistent with our hypotheses, they did not reflect any causal relations between mock jurors' induced emotional state, their visual attention, and the orientation of their judicial judgment. Mock jurors' induced emotional state was correlated

with their visual attention, as well as with the emotions they felt during the witness's testimony, and their judgment orientation. However, as we did not observe a correlation between their visual attention and their judgment orientation, we could not conduct analyses to test whether visual attention mediated the relationship between emotional state and judgment orientation.

As this was an exploratory study, it had several methodological limitations that may well explain this lack of a direct effect of visual attention on judgment orientation. First, the observed correlations showed patterns of results that resembled those in the literature, but a larger sample would have increased the robustness of the results. We nevertheless noted modest effect sizes and many correlations that pointed to the likelihood of finding meaningful effects. Second, although we paid particular attention to the ecological validity of our study (video showing extracts of a real-life court hearing), an actual trial probably has a greater emotional impact. Experimental findings may understate the strength of emotional influences on legal judgments. There is, of course, a difference between the strength of the emotions induced by laboratory manipulations and those aroused in actual trials (Tetlock et al., 2007), especially criminal cases (Bandes & Salerno, 2014). In addition, typical undergraduates responding to hypothetical cases for course credits are unlikely to experience the level of personal involvement and concern that tends to accompany decision making about real people's fates, heightening emotional intensity and hence possibly the impact of those emotions on judicial judgments (for a review, see Wiener, Krauss, & Lieberman, 2011). That said, the impact of participants' status (student vs. unselected) is not systematically observed in the relevant literature (Bornstein, 1999; Greene et al., 2002; Nietzel, McCarthy, & Kern, 1999). Third, this study was conducted in a legal context of harm to a person. In real-life, this context is probably quite challenging on affective dimensions (e.g., love, anger), and emotional mobilization can vary in both nature and intensity. Further studies are needed to take into account the emotional arousal elicited by the legal context, either to control for its

potential impact or to have a deeper understanding of how emotions contribute to information processing. Finally, in this study, we focused on individual pre-deliberation judgments.

Although these judgments have been found to be good predictors of a jury's final verdict (Sandys & Dillehay, 1995), it would nevertheless be useful to consider the impact of jurors' emotional states during jury deliberations too, particularly since collective decision-making differs from individual decision-making, in that it involves specific processes arising from processes of social influence. To settle this issue, we would have to analyze the outcome of collective discussions after the jurors had viewed the trial.

Conclusion

This experimental study provided several insights into implicit cognitive attentional processes related to emotional states that are not discernable at a declaratory level, but which may subtend jurors' construction of their judicial decisions. The place of emotion in the assize court is ambiguous (Gissinger-Bosse, 2018). Witnesses, victims and defendants are allowed to express their own emotional experiences, but none of the other actors, be they members of the public, experts, jurors or legal professionals, are allowed to let their emotions show. The intimate conviction instruction, one of the features of legal systems based on civil law, governs the decision-making process in most continental judicial systems (e.g., France, Germany and Belgium). In France, jurors are required to take an oath under Article 304 of the Code of Criminal Procedure that they will decide on the charges and defenses according to their "conscience" and "intimate conviction", "with the impartiality and firmness befitting a person of integrity and freedom". This impartiality requires them to guard against their prejudices and emotions: neither hatred nor malice, neither fear nor affectation, all of which may have negative or positive connotations that could be inspired by the personality of the accused, the nature of his or her crime, or the victim. However, for judges and jurors alike, intimate conviction represents a strong and trying emotional experience, in terms of both the

nature of the case and what is at stake in the decision (Esnard & Dumas, 2019a; Esnard & Dumas, 2019b). This is consistent with the legal framework, which clearly states the need to include a subjective assessment of the evidence in order to individualize the sentence, but excludes any subjective judgment that is liable to be based on emotions, preconceptions and any other extralegal factor that could be a source of potential discrimination. Consequently, our results have several implications for legal decision-making in the assize court. Our results highlight the need for greater interest in and deeper investigation of the processes subtending the influence of juror's emotional states on the construction of judicial decisions, in order to be able to clearly inform judicial systems.

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