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### ► To cite this version:

Hugo Mercier, Anne-Sophie Hacquin, Nicolas Claidière. Being easy to communicate might make verdicts based on confessions more legitimate. *Journal of Cognition and Culture*, 2021, 21 (3-4), pp.203-225. 10.1163/15685373-12340104 . ijn\_03451139

**HAL Id: ijn\_03451139**

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Submitted on 26 Nov 2021

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1           Being easy to communicate might make verdicts based on confessions more legitimate

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8                                           Author Note

9           This research was supported by the grant EUR FrontCog ANR-17-EURE-0017 and ANR-10-

10                                           IDEX-0001-02 PSL.

11

12   Data availability statement:

13   Data and scripts used to analyze the data are available online

14   ([https://osf.io/ntmqf/?view\\_only=a1eaf3ffe1cc4ea88d29eef276cf7ec6](https://osf.io/ntmqf/?view_only=a1eaf3ffe1cc4ea88d29eef276cf7ec6)).

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### Abstract

In many judicial systems, confessions are a requirement for criminal conviction. Even if confessions are intrinsically convincing, this might not entirely explain why they play such a paramount role. In addition, it has been suggested that confessions owe their importance to their legitimizing role, explaining why they could be required even when other evidence has convinced a judge. But why would confessions be particularly suited to justify verdicts? One possibility is that they can be more easily transmitted from one individual to the next, and thus spread in the population without losing their convincingness. 360 English-speaking participants were asked to evaluate the convincingness of one of three justifications for a verdict, grounded either in a confession, eyewitnesses, or circumstantial evidence, and to pass on that justification to another participant, who performed the same task. Then, 240 English-speaking participants evaluated the convincingness of some of the justifications produced by the first group of participants. Compared to the other justifications, justifications based on confessions lost less of their convincingness in the transmission process (small to medium effect sizes). Modeling pointed to the most common forms the justifications would take as they are transmitted, and results showed that the most common variant of the justification based on a confession was more convincing (small to medium effect sizes).

*Keywords:* Confessions, legitimacy, communication, cultural transmission.

36

37

38 Someone who confesses should know what they are talking about—their own actions—and, by  
39 contrast with denials, confessions do not appear self-interested. This makes confessions  
40 extremely convincing (Kassin & Neumann, 1997; see also, e.g., Henkel, 2008; Neuschatz et al.,  
41 2012), and has led many judicial systems to put much weight on them. However, other types of  
42 evidence—such as eyewitness testimony—can also be of high evidentiary value, and prove very  
43 convincing (e.g., Martire & Kemp, 2009). It is not immediately clear, then, why confessions  
44 should play a paramount role in so many judicial systems, where they are a *de facto* or even *de*  
45 *jure* requirement for conviction. This is particularly striking when other types of evidence would  
46 be sufficient to convince a judge or a jury, and yet a confession is still required for conviction.  
47 These requirements provide incentives for the judge or the prosecution to obtain confessions,  
48 requirements which they often meet by means ranging from psychological pressure to torture  
49 (Peters, 1996). In turn, these methods increase the rate of false confessions, and thus of wrongful  
50 convictions (Peters, 1996). Given that confessions, in spite of their intrinsic convincingness, do  
51 not have to play a paramount evidentiary role, and that incentives to obtain them have dire  
52 consequences, why are they granted such a special status in many judicial systems?

53

54 It has been suggested that confessions become a requirement because they render judicial  
55 decisions legitimate, as the public finds them convincing (e.g. Langbein, 2012). However, if  
56 other types of evidence could convince judges, it is not clear why they could not also convince  
57 the public. Here, we attempt to explain why confessions are perceived as a good way of

58 legitimizing judicial decisions by showing that they make for easy to communicate judgments  
59 which can be transmitted with relatively little loss of convincingness.

60

61 We start by briefly reviewing the role played by confessions in judicial systems across the world,  
62 showing that confessions often have a privileged status. We then turn to the problem of the  
63 legitimacy of judicial decisions, and the effects this has on judicial institutions. Historical  
64 evidence shows that confessions might have been favored because of their perceived capacity to  
65 legitimize judicial decisions. We highlight a previously largely ignored issue with legitimizing  
66 judicial decisions: the role played by interpersonal communication, and the challenges this raises  
67 due to the noisiness of human communication. We formulate our hypothesis—judgments based  
68 confessions are a good way of legitimizing judicial decisions because they can be communicated  
69 easily while remaining convincing—and test it with two experiments.

70

71 *The role of confessions in judicial systems across the world*

72

73 In many contemporary judicial systems, for which we have reliable statistical data, an  
74 overwhelming majority of criminal convictions are based on confessions. In Japan, at least 90%  
75 of convictions are based on confessions (Futaba & McCormack, 1984; Ramseyer & Rasmusen,  
76 2001). In China, defendants confess in three-quarters of cases (Lu & Miethe, 2003). In the U.S.,  
77 where it is preferable to look at plea bargains, a “functional analogue” of confessions (Ramseyer  
78 & Rasmusen, 2001, p. 57), we find that “97 percent of federal convictions and 94 percent of state  
79 convictions are the result of guilty pleas” (*Missouri v. Frye*, 2011, p. 2) (for more on the analogy  
80 between confessions and guilty pleas, see, e.g. Redlich, 2010). The importance of confessions is

81 also attested in many societies throughout history, from Tokugawa Japan (Ishii, 1964), to the  
82 ancient middle-east (Boyer, 1964; Brunschvig, 1964), or Rome after Constantine (Thomas, 1986).

83

84 In all too many cultures, the prominence of confessions is indirectly suggested by the use of  
85 judicial torture, whose main function is to extract confessions. In contemporary societies,  
86 “torture is used, formally or informally, in one country out of every three” (Peters, 1996, p. 5).  
87 The use of torture to extract confessions is also recurrent in the historical record (continental  
88 Europe after the thirteenth century, e.g., Langbein, 2012; China since the Han, Conner, 2000;  
89 Tokugawa Japan, Ishii, 1964; ancient Athens, Bonner, 1905; Rome after Constantine, Thomas,  
90 1986; ancient India, Rocher, 1964; more generally, see Peters, 1996), as well as in the  
91 anthropological record (e.g. the Barotse, Gluckman, 1967; or the Haya, where “torture was  
92 commonly used to extract a confession of guilt,” Cory & Hartnoll, 1945, p. 271). Beyond  
93 outright torture, several judicial processes—such as oaths, ordeals, or lie detectors—have been  
94 used—and continue to be used—to threaten the accused and obtain confessions (on ordeals, see,  
95 e.g., Hyams, 1981, p. 111; on lie detectors, see, e.g., Segrave, 2004; more generally, see, Mercier,  
96 2020; Mercier & Boyer, 2020).

97

98 In some cultures, the paramount role of confessions is enshrined in the law. The two best studied  
99 examples are Imperial China and medieval continental Europe. If confessions had been, in  
100 practice, nearly necessary and sufficient for conviction since at least the Tang (618 - 907), they  
101 became an absolute necessity under the early Qing (1644 - 1911), with very rare exceptions  
102 (Conner, 2000, p. 135). In continental Europe, starting in the thirteenth century, the requirements  
103 for a conviction in capital cases came to be strictly regimented: they required either two

104 eyewitnesses, or a confession (e.g., Langbein, 2012; Lévy, 1964). Since people tend to avoid  
105 committing crimes in front of multiple eyewitnesses, “European criminal procedure had no  
106 alternative; the law of proof was absolutely dependent upon coerced confessions” (Langbein,  
107 2012, p. 8).

108

109 Whether *de facto* or *de jure*, confessions are the cornerstone of many judicial systems. If the  
110 persuasiveness of confessions is undeniable, their evidentiary value on its own is not necessarily  
111 sufficient to explain their overwhelming dominance—in particular the fact that confessions are  
112 often mandatory, or quasi-mandatory for conviction, even when other evidence is sufficient to  
113 convince judge or jury. A complementary explanation for this dominance is the legitimacy  
114 confessions can lend judicial decisions.

115

116 *Confessions and the legitimization of judicial decisions*

117

118 It has been argued that the pressure to render legitimate decisions—decisions that are broadly  
119 accepted by the population—explains some central features of judicial systems (e.g. Caldeira &  
120 Gibson, 1995; Clark, 2009; Gleeson, 2000; Mercier & Boyer, 2020; Stephenson, 2004). Of  
121 particular relevance, Langbein (2012) has argued that Europe witnessed a shift in the means of  
122 legitimizing judicial decisions during the twelfth and thirteenth centuries. In earlier centuries,  
123 judicial decisions—in particular on capital crimes—were legitimized by the ordeal and its appeal  
124 to divine authority (see, Mercier, 2020). As the practice receded, two alternatives arose to meet  
125 the need for legitimizing decisions: the jury in England (although there was still a heavy reliance  
126 on confessions, see, Kamali, 2019), and the abovementioned rules of evidence in continental

127 Europe. Juries fulfilled their legitimizing function because judicial decisions rested with well-  
128 known and typically well-respected community members (see also, Fisher, 1997). More  
129 relevantly here, the rules of evidence found in continental Europe would have legitimized  
130 decisions through the intuitive convincingness of either a combination of two eyewitnesses, or a  
131 confession by the accused.

132

133 A significant piece of evidence showing the legitimizing role played by confessions is the  
134 explicit link drawn by medieval jurists between confession and notoriety. Notoriety was the  
135 highest level of proof one could attain, designating a “well known fact” (Lévy, 1964, p. 160).  
136 Notoriety was originally any fact that the public seemed to agree on (and thus similar to the  
137 related concept of *fama*, see, e.g. Vitiello, 2016), but it was then restricted to things the public  
138 could positively know. For a time, this only included things that everyone could directly perceive  
139 (Lévy, 1964, p. 161). However, since direct perception by the public is an impossible standard  
140 for criminal convictions, in the late twelfth and early thirteenth century, it is confessions that  
141 became “the essence of notoriety” (Lévy, 1964, p. 162). There is thus, in medieval Europe, a  
142 direct line between concerns about what the public believes (i.e. what is notorious) and the  
143 primacy of confessions in judicial decisions. Boyer has suggested that confessions played a  
144 similar role in ancient Middle-Eastern law, in which confession “not only made the judge’s task  
145 easier, but eased the acceptance of the sentence and its execution” (Boyer, 1964, p. 78).

146

147 The legitimizing role of confessions is also attested by less direct cues, such as the contrasting  
148 roles of judicial and extrajudicial confessions. In medieval European law, extrajudicial  
149 confessions were only one piece of evidence that judges could consider, by contrast with the



150 supreme role played by confessions gathered during the official course of the trial—including  
151 under torture (Lévy, 1964, p. 152; for a similar observation in ancient Middle-Eastern law, see  
152 Boyer, 1964, p. 79). If the main value of confessions was evidential, the difference between  
153 judicial and extrajudicial confessions should be largely immaterial.

154

155 The use of torture to extract confessions is also revealing. In most societies, legal scholars would  
156 have been conscious of the unreliability of torture as a mean of gathering evidence (in medieval  
157 Europe, “every jurist knew that torture represented a dangerous investigative device,” Fraher,  
158 1989, p. 29; on Imperial China, see, Conner, 2000; Imperial Rome, Langbein, 2012, p. 8; ancient  
159 Athens, Harrison, 1971, p. 147). Moreover, the official use of torture required that a significant  
160 amount of evidence already pointed to a culprit (in Imperial China, “the accused’s guilt should  
161 already have been established before an official employed torture to obtain a confession” Conner,  
162 2000, p. 138; on medieval Europe, see, Langbein, 2012; Lévy, 1964; ancient Athens, Bonner,  
163 1905, p. 69; Imperial Rome, Peters, 1996, p. 34). It is thus striking that judicial systems would  
164 require the use of torture, unreliable as it was known to be, to complement evidence that was  
165 strong enough to have someone tortured in the first place. This suggests that some evidence was  
166 deemed insufficient to convict not because of it lacked evidentiary weight (since it was deemed  
167 sufficient to have someone tortured), but because it did not make the decision appear legitimate  
168 enough.

169

170 In a variety of judicial systems—most clearly in medieval continental Europe, but also in  
171 Imperial China and others—the evidence points to confessions playing a paramount role in  
172 legitimizing judicial decisions. However, if it makes sense that confessions should be convincing,

173 other types of evidence can also be convincing—such as the evidence deemed sufficient to  
174 submit someone to judicial torture. If some evidence is good enough to convince the judge, why  
175 would it not also be good enough to convince the population?

176

177 *Legitimization and the problem of noisy communication*

178

179 A legitimate judicial decision is one whose justification is accepted by the population. Judges  
180 provide justifications in their judgments, and the people who have been involved in the trial, or  
181 who have followed it closely, should be able to evaluate these justifications properly, accepting  
182 them as legitimate if they provide good grounds for the verdict. However, in any but the smallest  
183 polities, some members of the public will be interested in the adequacy of a trial's outcome  
184 without having the opportunity of following the trial closely (even if only because of constraints  
185 on the size of the tribunal, restrictions on access, etc.). In modern societies, a proper justification  
186 for the verdict is typically available to all in the form of the judgment. However, very few people  
187 go to the trouble of perusing the details of judgments. Instead, they hear about the trial's outcome  
188 through third parties, such as journalists, or acquaintances who were involved or followed the  
189 trial closely.

190

191 The importance of interpersonal communication in the formation of public opinion has already  
192 been noted in other domains, for instance in political science (e.g. Druckman et al., 2018; Jensen,  
193 2016; Katz & Lazarsfeld, 1955), or in marketing (e.g. Berger, 2014; De Matos & Rossi, 2008).  
194 There is no reason to doubt that interpersonal communication also plays an important role in  
195 shaping public opinion as it relates to trial outcomes. The role of interpersonal communication

196 would have been even more important in past centuries, when few people could read, and there  
197 were no mass media or even local newspapers to publicize the outcome of trials. As a result, the  
198 justification offered by the judges for the verdict would often reach members of the public after  
199 several episodes of transmission, from the judge, to the audience who attended the trial, to those  
200 they shared the news with, to those these people then share the news with, etc. For example,  
201 Pettegree (2014, p. 120) notes how, in the sixteenth century, and in spite of the population being  
202 largely illiterate, “accounts of notorious crimes circulated widely, and for long after the event,”  
203 such accounts often describing the trial subsequent to the crimes.

204  
205 When information is transmitted across multiple steps, it is well known that it will suffer  
206 dramatic changes and losses. This phenomenon has been studied with transmission chains  
207 studies: experiments in which a participant is provided with a piece of information, must tell it to  
208 someone else, who then tells it to someone else, etc. With very few exceptions (e.g., Claidière et  
209 al., 2017), such chains lead to rapid losses of content (for reviews, see Mesoudi & Whiten, 2008;  
210 Miton & Charbonneau, 2018). For example, in Bartlett’s pioneering studies, a cogent, five-step,  
211 180-words argument related to speciation was reduced, after three transmission episodes to “Mr  
212 Garlick says isolation is the cause of modification of species. This seems proved by the test-case  
213 of Ireland with regard to snakes, toads and reptiles” (Bartlett, 1932a, pp. 166, 167). A very  
214 convincing argument was thus promptly made completely ineffective. The same deterioration  
215 would apply to the justification for a verdict. A justification that is very convincing, but that rests  
216 on a convergence of arguments, should lose much of its convincingness during the process of  
217 transmission, as people modify some elements, and forget others altogether. As a result, only few

218 members of the public—those with more intimate knowledge of the trial—would find the  
219 justification convincing, and it would fail to legitimize the verdict.

220

221 By contrast with verdicts grounded in relatively long or sophisticated justifications, a verdict  
222 based on a confession is easy to transmit while maintaining its convincingness. It's enough to say  
223 "he confessed" to provide a solid justification for nearly all criminal verdicts. This justification is  
224 readily remembered, and can be easily transmitted. Moreover, a loss of information might make  
225 a justification based on a confession more convincing. For example, if someone mentions that  
226 the confession might have been coerced, this makes the justification based on the confession less  
227 convincing (in some cases at least, see, Kassin & Wrightsman, 1980, 1981; Kassin & Sukel,  
228 1997). But if the mention of the coercion is forgotten, the justification should become more  
229 convincing. By contrast, other justifications, such as "there's evidence" or "someone saw him do  
230 it" call for more information to be convincing (What's the evidence? Is the eyewitness reliable?).

231

232 We thus formulate the following hypothesis: confessions have long played, and still play such a  
233 crucial legitimizing role in judicial systems not only because they make for convincing  
234 justifications, but also because they make for easy to transmit justifications. If we cannot directly  
235 test the historical role played by ease of transmission, we can test whether the basic premise—i.e.  
236 that confessions make for easy to transmit justifications—is observed in controlled settings. In  
237 two experiments, we test whether justifications based on confessions are easier to transmit, and  
238 whether their convincingness is more robust to repeated transmission than that of the two most  
239 salient alternatives: eyewitness testimony and circumstantial evidence.

240

241 *Experiment 1*

242

243 In Experiment 1, a first generation of participants was asked to read the descriptions of one of  
244 two crimes, provided with one of three arguments to the suspect's guilt (that he confessed, that  
245 there were eyewitnesses, or that there was circumstantial evidence), asked to evaluate the  
246 suspect's guilt, and then to explain to someone who hadn't been provided with these arguments  
247 why the suspect was thought guilty. Participants from a second generation read these  
248 explanations, rated how much they believed the suspect guilty, and explained to someone else  
249 why he was thought guilty. Finally, the procedure was repeated for participants from a third  
250 generation.

251

252 *Participants*

253 For each generation, the final sample consisted of 120 English-speaking participants recruited on  
254 the online crowdsourcing platform Prolific Academic, and thus 360 participants in total (245  
255 women,  $M_{Age} = 34.69$ ,  $SD = 12.07$ ). This sample size was reached after excluding 99 participants  
256 who had failed the attention check (see below). All experiments were approved by the  
257 [REDACTED], approval number [REDACTED].

258

259 *Materials*

260 The description of the two crimes read as follows: "Amanda Jenkins has been found unconscious  
261 in her front yard. She had been severely beaten" (Assault), and "Andres Souza's home has been  
262 vandalized, with broken furniture, and paint thrown all over" (Vandalism). The arguments read  
263 as follows. For the Assault story:

264

265 Confession: “Michael Jenkins, her husband, has been apprehended. After an interrogation  
266 by the police, he confessed to having beaten his wife. He said he was jealous and thought  
267 he’d found evidence of her unfaithfulness. He said he regretted his actions. However, the  
268 police had been detaining him for hours, and they might have exerted undue pressure on  
269 Michael before he confessed.”

270

271 Evidence: “Michael Jenkins, her husband, has been apprehended. The police forensics  
272 department found traces of Amanda Jenkins’ blood on his hands and clothes, as well as  
273 contusions on his hands best explained by violent shocks. Michael has no alibi, and a  
274 history of violent behavior.”

275

276 Eyewitness: “Michael Jenkins, her husband, has been apprehended. Two neighbors  
277 identified him as the culprit, saying they’d seen him arguing with his wife, accusing her  
278 of infidelity, then beating her violently and leaving her in the front yard.”

279

280 For the Vandalism story:

281

282 Confession: “Ethan Paul, Andres Souza’s neighbor, has been apprehended. After an  
283 interrogation by the police, Ethan Paul confessed to having vandalized the house. He said  
284 he and Andres Souza had been fighting over various issues for years, and that Souza had  
285 recently violently insulted him. However, the police had been detaining him for hours,  
286 and they might have exerted undue pressure on Paul before he confessed.”

287

288 Evidence: “Ethan Paul, Andres Souza’s neighbor, has been apprehended. The police  
289 found in Souza’s house a can of spray paint with Paul’s fingerprints. At Paul’s house, they  
290 found a baseball bat, and proved it had been used to vandalize Souza’s house. Ethan Paul  
291 has no alibi, and a history of violent behavior.”

292

293 Eyewitness: “Ethan Paul, Andres Souza’s neighbor, has been apprehended. A policeman  
294 found a maid hidden in a closet, terrified. She said she had seen it was Ethan Paul who’d  
295 vandalized the house. She was positive in her identification, being used to see Paul  
296 staring at Andres Souza’s house as she would go in.”

297

298 We chose a scenario involving a crime against a person, and one a crime against property, since  
299 both types of crimes might be processed differently, and this increases the validity of the  
300 experiment. A pre-test had suggested that participants found the Evidence and Eyewitness  
301 arguments at least as convincing as the Confession argument, so that any bias in the transmission  
302 chain in favor of confessions could not be attributed to their initial convincingness (a result that  
303 will be confirmed in the guilt ratings of first generation below).

304

305 It might appear surprising that Confession arguments were not judged more convincing than the  
306 other two types of arguments. However, as noted above, even if the confessions ought to be  
307 deemed convincing, there is no reason they should be intrinsically more convincing than any  
308 other evidence. Moreover, the Confession argument mentioned police pressure, a factor that has

309 been shown to influence (even if arguably not sufficiently) the convincingness of confessions  
310 (Kassin & Sukel, 1997; Kassin & Wrightsman, 1980, 1981).

311

312 *Design and procedure*

313 All participants started by completing a consent form, and finished by completing an attention  
314 check and providing demographic information. Participants of the first generation were first  
315 presented with a text introduced as having been read in the Monday newspaper, describing the  
316 crime (Assault or Vandalism, between-participant). They were then presented with the one of the  
317 three seed arguments (Confession, Evidence, Eyewitness, between- participant), introduced as  
318 having been read in the Tuesday newspaper. After having read the argument, participants were  
319 asked the following question: “How likely do you think it is that [the suspect committed the  
320 crime described in the text]?” on a seven-point Likert scale ranging from “Impossible” (1) to  
321 “Completely certain” (7), with the central measure “Somewhat likely” (4). Participants were then  
322 told that they met a friend who knew about the crime (e.g. about “Amanda Jenkins being beaten  
323 and found unconscious in her front yard”), but had no information about the suspect. Participants  
324 were asked to answer to questions raised by this friend: “Who do they think did it?” and “Why  
325 do they think he’s guilty?”

326

327 Participants in the second generation completed nearly exactly the same survey as those of the  
328 first generation. They read about the crime in the Monday newspaper. However, they did not get  
329 more information from the Tuesday newspaper (the seeds presented to participants from the first  
330 generation). They were told that there was information in the Tuesday newspaper, but that they  
331 didn’t know what it was. Instead, they met a friend who had more information, and who told



332 them about who the suspect was, and why they were believed to be guilty. These pieces of  
333 information were the answers provided by one of the participants from the first generation. The  
334 rest of the survey was identical to the first generation.

335

336 Finally, participants in the third generation completed exactly the same survey as those of the  
337 second generation, the only difference being that the arguments they received came from a  
338 participant of the second generation instead of the first.

339

340 At each generation, the answers to the first question (i.e. “who do they think did it”) acted as a  
341 supplementary attention check. Participants who were unable to mention the suspect either by  
342 name, or through their relationship with the victim (husband or neighbor) were deemed not to  
343 have paid sufficient attention and removed. New participants were recruited to fill their place in  
344 the transmission chain.

345

346 All the materials can be found in the Electronic Supplementary Materials (ESM). The survey was  
347 displayed on the platform Qualtrics.

348

349 *Coding*

350 Each post was manually coded by the last author of the article (details can be found in the ESM).

351 The first step consisted in coding whether participants had mentioned the name of the suspect or  
352 his relationship to the victim (i.e. husband or neighbor), in their answer to the question “Who do  
353 they think did it?” The second step focused on the answer to the question “Why do they think  
354 he’s guilty?,” in order to code which elements of the justification for the verdict participants

355 transmitted. The presence or absence of the following elements were coded. In the Confession  
356 Condition: confession; explanation of the crime (e.g. his neighbor had recently violently insulted  
357 him); police pressures to extract the confession. In the Eyewitness Condition: witness or  
358 witnesses; credibility of the witnesses (e.g. the fact that the maid was inside the house when it  
359 was vandalized); mention of the number of witnesses; explanation of the crime (e.g. the husband  
360 accused his wife of infidelity). In the Evidence Condition: first piece of evidence (the can of  
361 spray paint with fingerprints / traces of Amanda Jenkins' blood on Michael Jenkins hands or  
362 clothes); second piece of evidence (the baseball bat / contusions on Michael Jenkins hands); third  
363 piece of evidence (no alibi); fourth piece of evidence (history of violent behavior). In each  
364 condition, one element was deemed to be the central element: the confession, the presence of  
365 eyewitnesses, or the first piece of evidence.

366

367 To ensure the validity of the coding, an independent coder, blind to our hypotheses, coded 20%  
368 randomly selected answers. To measure the inter-rater reliability, we calculated Cohen's Kappa  
369 coefficient. Agreement scores among the coders was 84.86% and the strength of agreement was  
370 considered to be substantial.

371

### 372 *Results and discussion*

373 All analyses were done with R (v.3.6.1, R Core Team, 2020), using R Studio (v.1.2.5019,  
374 RStudio Team, 2015). We refer to being 'statistically significant' as having a  $p$ -value lower than  
375 an alpha of 0.05. Standardized coefficients are shown.

376

### 377 Comparing the overall guilt ratings

378 Our main measure is the guilt rating, which is the answer to the question “How likely do you  
379 think it is that [the suspect committed the crime described in the text]?” Higher ratings mean that  
380 participants rated the suspect as more likely to be guilty. In order to test whether justifications  
381 based on confessions, compared to justifications based on eyewitnesses or circumstantial  
382 evidence, are more likely to remain convincing (and thus to yield high guilt ratings) across  
383 multiple transmission episodes, we use a three-pronged strategy: a three-way analysis of variance  
384 (ANOVA) to observe the overall pattern, a slope analysis, and a comparison of the guilt ratings at  
385 the first and last generations.

386

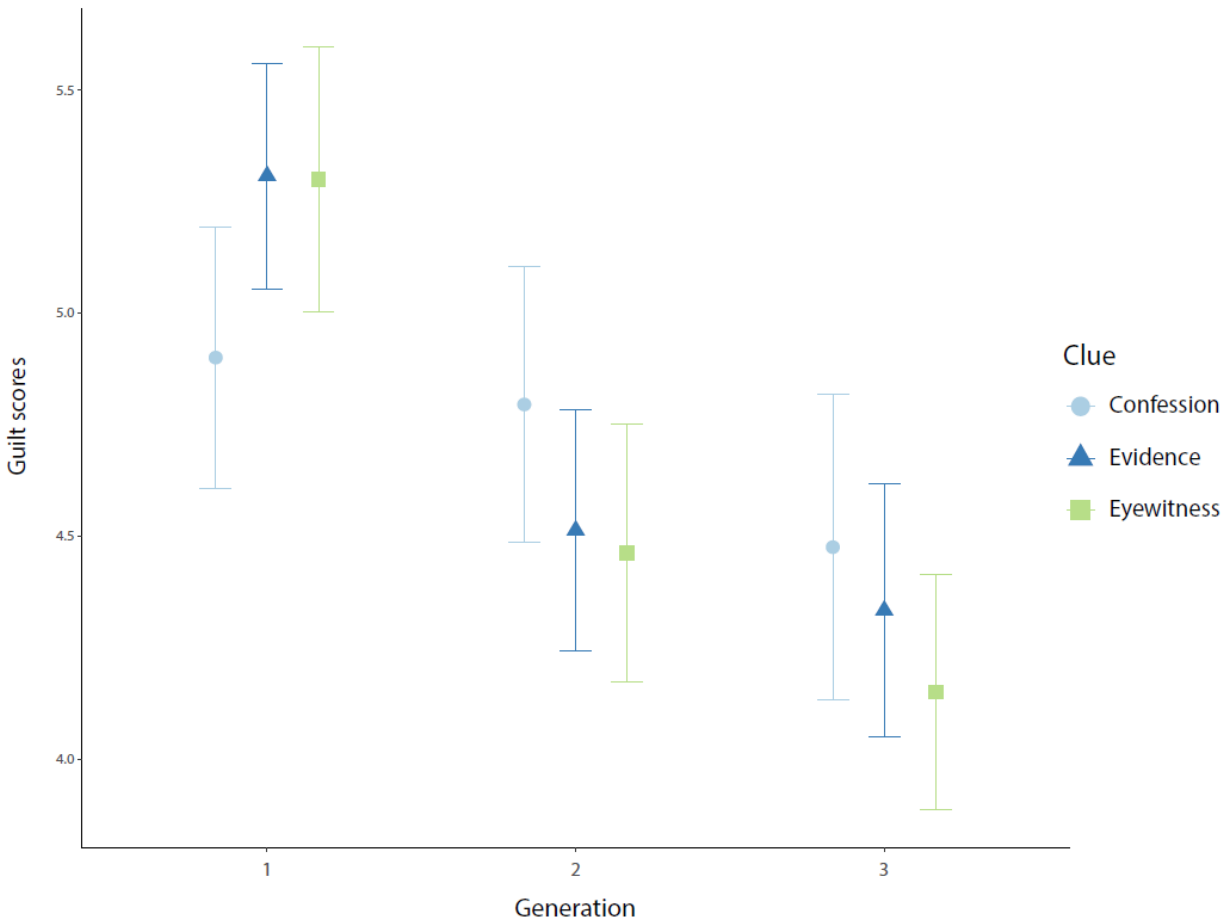
387 First, an ANOVA was conducted to compare the main effects of the type of clue (Confession,  
388 Eyewitness, Evidence), the generation (First, Second, Third), and the interaction between the  
389 type of clue and the generation on the guilt rating. There was a medium effect of the generation  $F$   
390  $(1, 359) = 51.09, p < .001, \eta^2 = 0.12$ , with participants from the first generation ( $M = 5.17, SD =$   
391  $0.90$ ) rating the suspect as more guilty than participants from the second generation ( $M = 4.57,$   
392  $SD = 0.92$ ), Welch’s  $t(237.86) = 5.09, p < .001, d = 0.67$ , and participants from the second  
393 generation rating the suspect as more guilty than participants from the third generation ( $M = 4.32,$   
394  $SD = 0.94$ ), Welch’s  $t(237.89) = 2.07, p = .039, d = 0.27$ . The type of clue had no influence on  
395 guilt ratings,  $F(2, 359) = 0.27, p = .77, \eta^2 = 0.001$ . Crucially, there was a small effect of the  
396 interaction between the type of clue and the generation on the guilt imputed to a suspect,  $F(2,$   
397  $359) = 3.37, p = .03, \eta^2 = 0.02$ . The interaction is detailed in the post-hoc analyses below and can  
398 be visualized in Figure 1.

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403

404 *Figure 1. Effects on guilt ratings of the interaction between the generation (first to third) and the*  
 405 *nature of the clue presented to the participants (confession, eyewitness, circumstantial evidence).*

406 *The full range of guilt rating is [1-7].*

407

408 Next, we compared the slopes (in absolute value) of the effect on guilt ratings of the generations  
 409 (i.e. how quickly the guilt ratings drop across the generations). The comparison between the  
 410 Confession Condition ( $trend = 0.212, SE = 0.103$ ) and the Eyewitness Condition ( $trend = 0.575,$   
 411  $SE = 0.103$ ) was significant,  $t(354) = 2.49, p = .035$ . However, the difference between the

412 Confession Condition ( $trend = 0.212$ ,  $SE = 0.103$ ) and the Evidence Condition ( $trend = 0.487$ ,  $SE$   
413  $= 0.103$ ), was not significant,  $t(354) = 1.89$ ,  $p = .144$ .

414

415 Finally, we compared the guilt ratings of the first and third generations. In the Confession  
416 Condition, there was no significant difference between the guilt ratings of the first generation ( $M$   
417  $= 4.9$ ,  $SD = 0.93$ ) and of the third generation ( $M = 4.48$ ,  $SD = 1.09$ ), Welch's  $t(76.16) = 1.88$ ,  $p$   
418  $= .06$ ,  $d = 0.42$  (small effect). In the Eyewitness Condition, there was a significant decrease in  
419 guilt ratings between the first generation ( $M = 5.3$ ,  $SD = 0.94$ ) and the third generation ( $M = 4.15$ ,  
420  $SD = 0.83$ ), Welch's  $t(76.92) = 5.79$ ,  $p < .001$ ,  $d = 1.3$  (large effect). In the Evidence Condition,  
421 there was a significant decrease in guilt ratings between the first generation ( $M = 5.3$ ,  $SD = 0.79$ )  
422 and the third generation ( $M = 4.33$ ,  $SD = 0.89$ ), Welch's  $t(76.97) = 5.18$ ,  $p < .001$ ,  $d = 1.17$   
423 (large effect).

424

425 Taken together these three analyses suggest that justifications based on confessions, compared to  
426 justifications based on eyewitnesses or circumstantial evidence, lost less of their convincingness  
427 in the process of repeated transmission.

428

#### 429 Guilt ratings associated with the central elements

430 Our hypothesis is that justifications based on confessions remain more convincing because they  
431 can be expressed succinctly (i.e. "the suspect confessed") and convincingly, while the  
432 convincingness of other justifications rests on the conjunction of several elements (e.g. the  
433 presence of eyewitnesses, but also their credibility, their number, etc.). As some of these  
434 elements are lost in the transmission process, the justifications become less convincing. To test

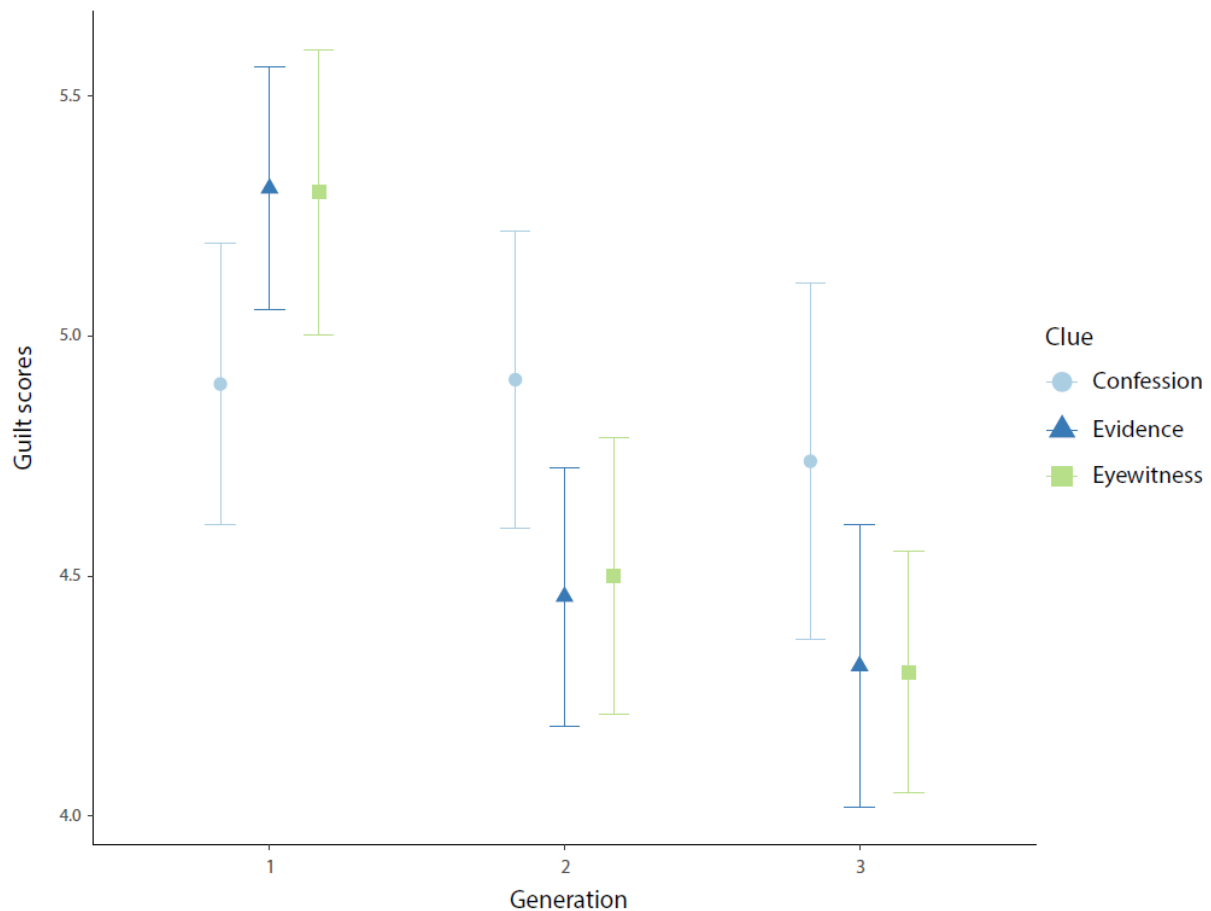
435 this hypothesis, we use the same three-pronged strategy as above, but looking at the guilt ratings  
436 of the participants who received at least the central element of each justification. As noted in the  
437 coding section, the central element was, respectively, the confession, the presence of  
438 eyewitnesses, and the first piece of evidence (which was the piece of evidence most likely to be  
439 transmitted, see table with the transmission probabilities of each element in the ESM).

440

441 First, an ANOVA was conducted to compare the main effects of the type of clue (Confession,  
442 Eyewitness, Evidence), the generation (First, Second, Third), and the interaction between the  
443 type of clue and the generation on the guilt ratings, for participants who received (at least) the  
444 central element in the input justification. There was a medium effect of the generation  $F(2, 303)$   
445  $= 19.07, p < .001, \eta^2 = 0.11$ , with participants from the first generation ( $M = 5.17, SD = 0.90$ )  
446 rating the suspect as more guilty than participants from the second generation ( $M = 4.60, SD =$   
447  $0.92$ ), Welch's  $t(219.21) = 4.63, p < .001, d = 0.62$ , but no difference between the guilt ratings in  
448 the second and third generations ( $M = 4.42, SD = 0.96$ ), Welch's  $t(178.51) = 1.35, p = .18, d =$   
449  $0.20$ . The type of clue had no influence on guilt ratings,  $F(2, 303) = 0.77, p = .46, \eta^2 = 0.004$ .  
450 Crucially, there was a small interaction between the type of clue and the generation,  $F(4, 303) =$   
451  $3.38, p = .01, \eta^2 = 0.04$ . The interaction can be visualized in Figure 2.

452

453



454

455 *Figure 2. Effect on guilt ratings of the interaction between the generation and the nature of the*  
 456 *clue presented to the participants, for participants who received at least the central element of*  
 457 *the justification. The full range of guilt rating is [1-7].*

458

459 Next, we compared the slopes (in absolute value) of the effect on guilt ratings of the generations  
 460 (i.e. how quickly the guilt ratings drop across the generations). The comparison between the  
 461 Confession Condition (*trend* = 0.07, *SE* = 0.12) and the Eyewitness Condition (*trend* = 0.52, *SE*  
 462 = 0.11) was significant,  $t(306) = 2.74, p = .02$ , as was the difference between the Confession  
 463 Condition (*trend* = 0.07, *SE* = 0.12) and the Evidence Condition (*trend* = 0.51, *SE* = 0.11),  $t$   
 464 (306) = 2.73,  $p = .02$ .

465

466 Finally, we compared the guilt ratings of the first and third generations. In the Confession  
467 Condition, there was no significant difference between the guilt ratings of the first generation ( $M$   
468 = 4.9,  $SD = 0.93$ ) and of the third generation ( $M = 4.74$ ,  $SD = 1.18$ ), Welch's  $t(37.84) = 0.56$ ,  $p$   
469 = .58,  $d = 0.16$  (negligible effect). In the Eyewitness Condition, there was a significant decrease  
470 in guilt ratings between the first generation ( $M = 5.3$ ,  $SD = 0.94$ ) and the third generation ( $M =$   
471  $4.3$ ,  $SD = 0.79$ ), Welch's  $t(66.96) = 4.82$ ,  $p < .001$ ,  $d = 1.14$  (large effect). In the Evidence  
472 Condition, there was a significant decrease in guilt ratings between the first generation ( $M = 5.3$ ,  
473  $SD = 0.79$ ) and the third generation ( $M = 4.3$ ,  $SD = 0.92$ ), Welch's  $t(63.62) = 4.91$ ,  $p < .001$ ,  $d =$   
474  $1.17$  (large effect).

475

476 To some extent, the stability of the justifications based on confessions comes from many  
477 participants failing to mention the potential role of police pressure which was present in the  
478 initial justification. Justifications that contained this element were much less convincing ( $M = 4.1$ ,  
479  $SD = 1.10$ ) than those which did not ( $M = 5.2$ ,  $SD = 0.91$ ). Moreover, participants were likely to  
480 fail to mention this element: of the participants who received the mention of police pressures,  
481 and mentioned the confession in their justifications, only one third (34%) also mentioned the  
482 police pressures. That most participants do not report the potential police pressures thus helps  
483 explain the continued convincingness of justifications based on confessions.

484

485 Taken together these three analyses show that the central element of justifications based on  
486 confessions, compared to the central element of justifications based on eyewitnesses or  
487 circumstantial evidence, lost less of its convincingness in the process of repeated transmission.



488 However, we cannot rule out that elements besides the central elements should be well  
489 transmitted, and thus that justifications besides convictions remain convincing after multiple  
490 transmission. To better understand the effects of repeated transmission on the justifications, we  
491 use modeling.

492

### 493 **Modeling**

494 To better understand the dynamic of information transmission, and its consequences beyond the  
495 three generations tested in Experiment 1, we can use models to extrapolate from the current data  
496 (on the importance of modeling to link experimental data to cultural trends, see, e.g. Boyd &  
497 Richerson, 2005; Kalish, Griffiths, & Lewandowsky, 2007; Kirby, Dowman, & Griffiths, 2007).  
498 More specifically, we used evolutionary causal matrices to represent the transformations  
499 occurring during transmission (here, the loss in some justificatory elements), and simulate the  
500 long term effects of these transformations (Claidière, Scott-Phillips, & Sperber, 2014; for  
501 examples of studies using this method in conjunction with experimental data, see Altay, Claidière,  
502 & Mercier, 2020; Claidière et al., 2018; Miton, Claidière, & Mercier, 2015). These models  
503 describe a situation in which a new group of participants (a new generation of agents) would  
504 receive the justifications transmitted by our participants, and would behave in the same way as  
505 our participants did, in terms of which elements they mention as a function of which element  
506 they had received.

507

508 The model makes the following assumptions. First, it assumes that the transmission process is  
509 similar to a Markov process in being memoryless: agents at each new generation behave exactly  
510 like those from other generations, conditional on the input they receive. Second, the model

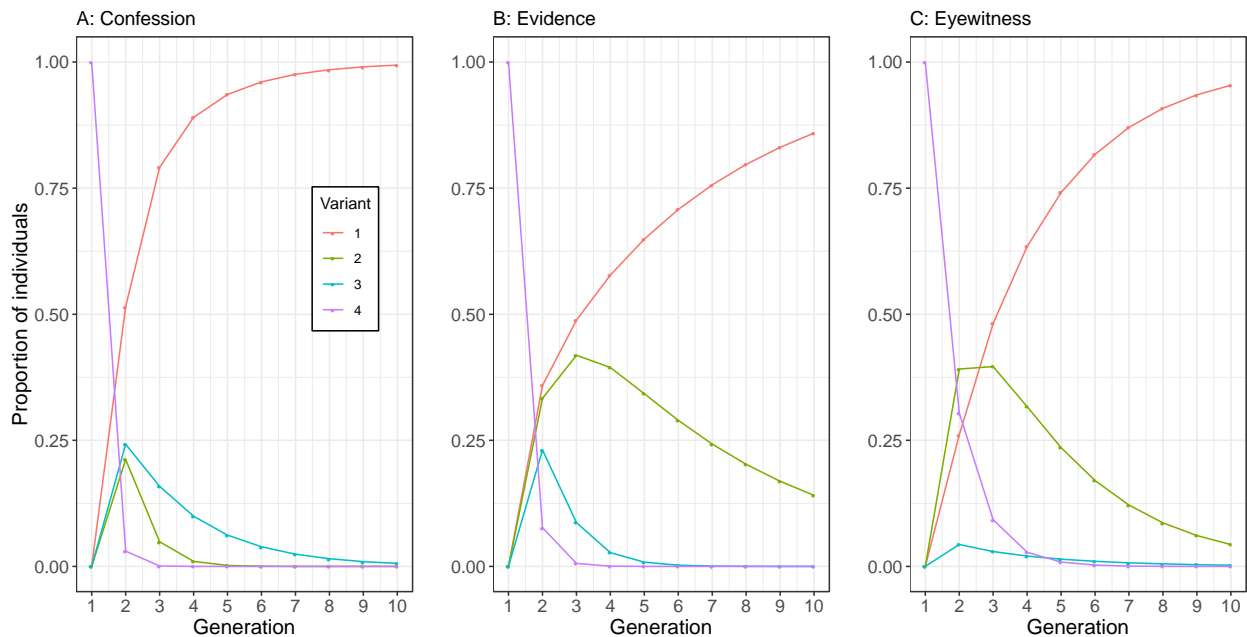
511 assumes that the total number of agents per generation remains constant, neglecting in particular  
512 the participants who fail to report either the central element (in the Confession and Eyewitness  
513 Conditions), or one of the elements (in the Evidence Condition). This assumption is necessary  
514 since otherwise all models would lead to the rapid extinction of the phenomenon of interest due  
515 to the inevitability of loss in simple transmission chains (a phenomenon well-known at least  
516 since Bartlett, 1932). In real life, transmission chains are barely ever linear, with one individual  
517 only transmitting to one other individual; instead, chains are full of redundancies, with each  
518 individual receiving information from, and transmitting information to, several individuals. This  
519 redundancy is typically necessary for cultural elements to persist or to spread (Acerbi & Tennie,  
520 2016; Altay et al., 2020; Claidière et al., 2017; Enquist et al., 2010; Kempe et al., 2014; Morin,  
521 2015). The assumption of a fixed total number of agents is a simple way of taking this into  
522 account.

523

524 For each condition, we generated a matrix with the different variants of each justification, as a  
525 function of which elements were present (see coding above for more details on the elements). In  
526 the Confession Condition, the four variants were: (1) confession only; (2) confession and  
527 explanation of the crime; (3) confession and police pressures to extract the confession; (4)  
528 confession, explanation of the crime, and police pressures to extract the confession. In the  
529 Eyewitness Condition, the four variants were: (1) witness(es) only; (2) witness(es) and  
530 credibility of the witness(es); (3) witness(es) and explanation of the crime; (4) witness(es),  
531 credibility of the witness(es), and explanation of the crime. In the Evidence Condition, the four  
532 variants were: (1) one piece of evidence; (2) two pieces of evidence; (3) three pieces of evidence;  
533 (4) four pieces of evidence.

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For each of these variants, the data from Experiment 1 tells us, when the variant is received by the participants, what variants are then transmitted. For example, of the 41 participants who received variant (4) of the justification based on confession (the one used as the seed), only one retained all the elements to transmit variant (4), eight transmitted variant (3), seven transmitted variant (2), 17 transmitted variant (1), and eight failed to mention the confession (and were thus not taken into account in the model) (full data available in ESM). Based on the equivalent figures for each variant, Figure 3 provides the output of the model for each of the three conditions.



545  
546  
547

Figure 3. Simulation of the evolution of the variants of each of the justifications. The parameters were chosen based on the results of Experiment 1. The initial proportions correspond to the case

548 *in which the full justification (variant (4)) is initially the only variant. See text for details of the*  
549 *variants.*

550

551 These models make it clear which variants dominate in the space between a small number of  
552 transmission episodes (two at most), and for at least 10 transmission episodes (a number large  
553 enough to reach every member of a medium-scale population if we assume even a minimal  
554 amount of redundancy). In the case of justifications based on a confession, the dominant variant  
555 is (1) (confession only). In the case of justifications based on eyewitness(es), the dominant  
556 variants are (1) (witness(es) only), and (2) (witness(es) and credibility of the witness(es)). In the  
557 case of justifications based on circumstantial evidence, the dominant variants are (1) (one piece  
558 of evidence), and (2) (two pieces of evidence).

559

560 Participants receiving variant (1) of the justification based on confession ( $M = 5.2$ ,  $SD = 0.90$ )  
561 rated the suspect as significantly more likely to be guilty than participants receiving variant (1)  
562 of the justification based on eyewitness(es) ( $M = 4.24$ ,  $SD = 0.94$ ), Welch's  $t(40.7) = 3.76$ ,  $p <$   
563  $.001$ ,  $d = 1.05$  (large effect), participants receiving variant (1) of the justification based on  
564 circumstantial evidence ( $M = 4.5$ ,  $SD = 0.86$ ), Welch's  $t(59.83) = 4.76$ ,  $p < .001$ ,  $d = 1.17$  (large  
565 effect), participants receiving variant (2) of the justification based on circumstantial evidence ( $M$   
566  $= 4.24$ ,  $SD = 0.66$ ), Welch's  $t(55.05) = 3.03$   $p = .004$ ,  $d = 0.78$  (medium effect)), and participants  
567 receiving variant (2) of the justification based on eyewitness(es) ( $M = 4.64$ ,  $SD = 0.99$ ), Welch's  $t$   
568 ( $62.23$ )  $= 3.2$ ,  $p = .002$ ,  $d = 0.79$  (medium effect).

569

570 **Experiment 2**

571 Experiment 2 seeks to test the robustness of the differences in convincingness of the five variants  
572 of justifications shown by the models to be the most common after repeated transmission.

573

#### 574 *Participants*

575 We recruited 240 English-speaking participants on the crowdsourcing platform *Prolific*. We  
576 excluded one participant who failed at the attention check (described in the ESM), leaving 239  
577 participants (158 women,  $M_{Age} = 35.64$ ,  $SD = 12.44$ ). This approximatively doubles the sample  
578 available for the five relevant variants in Experiment 1.

579

#### 580 *Materials*

581 For each of the two stories (vandalism and assault), and of the three conditions (Confession,  
582 Eyewitness, Evidence), we selected at random three justifications (among those generated in  
583 Experiment 1) that fit with each of the five most common variants, for a total of 30 different  
584 justifications (all the justifications are available in the ESM).

585

#### 586 *Design and procedure*

587 The design is similar to that of the first generation of Experiment 1, except that participants, after  
588 they had provided guilt ratings, were not asked to transmit the justification.

589

#### 590 *Results and discussion*

591 Participants receiving variant (1) of the justification based on confession ( $M = 4.78$ ,  $SD = 0.99$ )  
592 rated the suspect as significantly more likely to be guilty than participants receiving variant (1)  
593 of the justification based on eyewitness(es) ( $M = 4.21$ ,  $SD = 0.82$ ), Welch's  $t(92) = 3.08$ ,  $p =$

594 .003,  $d = 0.62$  (medium effect), participants receiving variant (1) of the justification based on  
595 circumstantial evidence ( $M = 4.06$ ,  $SD = 0.76$ ), Welch's  $t(90) = 3.97$ ,  $p < .001$ ,  $d = 0.81$  (large  
596 effect), and participants receiving variant (2) of the justification based on circumstantial evidence  
597 ( $M = 4.24$ ,  $SD = 0.80$ ), Welch's  $t(92) = 2.92$ ,  $p = .004$ ,  $d = 0.59$  (medium effect)), but not than  
598 participants receiving variant (2) of the justification based on eyewitness(es) ( $M = 4.43$ ,  $SD =$   
599  $0.93$ ), Welch's  $t(95) = 1.75$ ,  $p = .084$ ,  $d = 0.37$  (small effect).

600

601 Taken together with the results of Experiment 1, the results of Experiment 2 show that the most  
602 common variant of the justification based on confession is more convincing than the most  
603 common variants of the justifications based on eyewitnesses or circumstantial evidence.

604

## 605 **Conclusion**

606 In many historical and contemporary judicial systems, confessions play a crucial role, a role that  
607 might not be entirely explained by their evidential value; in particular, confessions might also  
608 play a legitimizing role. In the present article, we offer further evidence that confessions are apt  
609 to play such a role: their convincingness as justifications is robust to repeated transmission. By  
610 contrast with justifications based on eyewitnesses or circumstantial evidence, justifications based  
611 on confessions retained more of their convincingness as they were transmitted from one  
612 participant to the next (Experiment 1). When participants transmit these three types of  
613 justifications, some elements of the justifications are lost in the process. In the case of  
614 justifications grounded in eyewitnesses and circumstantial evidence, these losses made the  
615 justifications much less convincing (e.g. because the number of pieces of circumstantial evidence  
616 decreased). By contrast, in the case of confessions, these losses did not affect the convincingness

617 of the justification, as long as the central element (i.e. the confession itself) was retained. Indeed,  
618 in some cases the loss increased the convincingness of the justifications, when it was the mention  
619 of potential police pressures that was omitted.

620

621 Modeling showed which types of justifications would be more common after repeated  
622 transmission, and the results of Experiments 1 and 2 show that the most common variant of the  
623 justification based on confessions was more convincing than the most common variants of the  
624 justifications based on eyewitnesses or circumstantial evidence.

625

626 Our experiments have several limitations. First, the convincingness of the confessions was  
627 lowered by the mention of potential coercion, an element that could be specifically manipulated  
628 in further experiments. Second, we only used a small set of vignettes, which are obviously far  
629 from covering the full range of types of justifications for verdicts. Third, the experiments were  
630 only conducted in one cultural group, and ought to be replicated in other settings.

631

632 The stress put on confessions in many judicial systems is theoretically puzzling—i.e. it is not  
633 obvious why it should exist—and practically relevant—given that it brings in its wake very  
634 problematic features, from torture to false confessions. Our results show that ease of  
635 transmission might be one element that compounds the intrinsic convincingness of confessions,  
636 making them particularly suited for legitimizing judicial decisions. The present study also show  
637 that some light can be shone on such matters by combining a variety of methods: analysis of the  
638 historical record (showing, e.g., the explicit importance of legitimacy for medieval jurists),  
639 experimental data, and modeling.

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