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1	Being easy to communicate might make verdicts based on confessions more legitimate
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16 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).

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Keywords: Confessions, legitimacy, communication, cultural transmission.

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

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

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

The role of confessions in judicial systems across the world

In many contemporary judicial systems, for which we have reliable statistical data, an overwhelming majority of criminal convictions are based on confessions. In Japan, at least 90% of convictions are based on confessions (Futaba & McCormack, 1984; Ramseyer & Rasmusen, 2001). In China, defendants confess in three-quarters of cases (Lu & Miethe, 2003). In the U.S., where it is preferable to look at plea bargains, a "functional analogue" of confessions (Ramseyer & Rasmusen, 2001, p. 57), we find that "97 percent of federal convictions and 94 percent of state convictions are the result of guilty pleas" (*Missouri v. Frye*, 2011, p. 2) (for more on the analogy 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 ancient middle-east (Boyer, 1964; Brunschvig, 1964), or Rome after Constantine (Thomas, 1986). 82 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

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

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

Confessions and the legitimization of judicial decisions

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

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

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

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

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

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

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

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

Legitimization and the problem of noisy communication

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

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

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

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

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

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

We thus formulate the following hypothesis: confessions have long played, and still play such a crucial legitimizing role in judicial systems not only because they make for convincing

test the historical role played by ease of transmission, we can test whether the basic premise—i.e. that confessions make for easy to transmit justifications—is observed in controlled settings. In two experiments, we test whether justifications based on confessions are easier to transmit, and

justifications, but also because they make for easy to transmit justifications. If we cannot directly

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whether their convincingness is more robust to repeated transmission than that of the two most

salient alternatives: eyewitness testimony and circumstantial evidence.

# Experiment 1

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

Participants

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

Materials

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

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

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

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

## For the Vandalism story:

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

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

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

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

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

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

Design and procedure

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

Participants in the second generation completed nearly exactly the same survey as those of the first generation. They read about the crime in the Monday newspaper. However, they did not get more information from the Tuesday newspaper (the seeds presented to participants from the first generation). They were told that there was information in the Tuesday newspaper, but that they 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

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

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

Results and discussion

All analyses were done with R (v.3.6.1, R Core Team, 2020), using R Studio (v.1.2.5019,

RStudio Team, 2015). We refer to being 'statistically significant' as having a *p*-value lower than

an alpha of 0.05. Standardized coefficients are shown.

### Comparing the overall guilt ratings

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

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

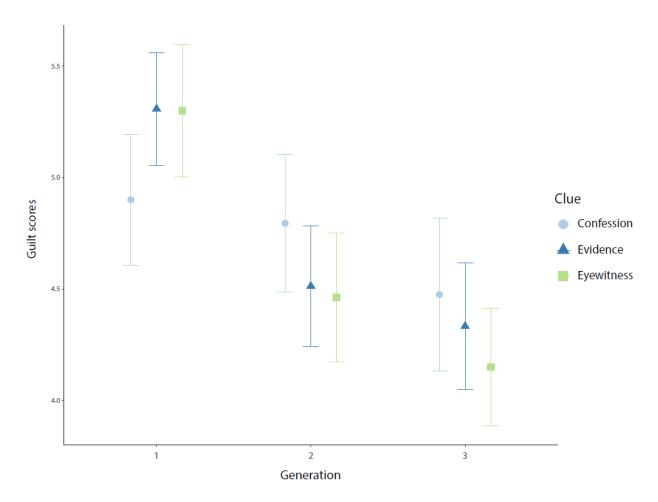


Figure 1. Effects on guilt ratings of the interaction between the generation (first to third) and the nature of the clue presented to the participants (confession, eyewitness, circumstantial evidence).

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

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

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

Finally, we compared the guilt ratings of the first and third generations. In the Confession

Condition, there was no significant difference between the guilt ratings of the first generation (M = 4.9, SD = 0.93) and of the third generation (M = 4.48, SD = 1.09), Welch's t (76.16) = 1.88, p = .06, d = 0.42 (small effect). In the Eyewitness Condition, there was a significant decrease in

SD = 0.83), Welch's t (76.92) = 5.79, p < .001, d = 1.3 (large effect). In the Evidence Condition,

there was a significant decrease in guilt ratings between the first generation (M = 5.3, SD = 0.79)

guilt ratings between the first generation (M = 5.3, SD = 0.94) and the third generation (M = 4.15,

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).

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

#### Guilt ratings associated with the central elements

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

this hypothesis, we use the same three-pronged strategy as above, but looking at the guilt ratings 435 436 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 evewitnesses, 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)= 19.07, p < .001,  $\eta^2 = 0.11$ , with participants from the first generation (M = 5.17, SD = 0.90) 445 446 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 =0.20. The type of clue had no influence on guilt ratings, F(2, 303) = 0.77, p = .46,  $\eta^2 = 0.004$ . 449 Crucially, there was a small interaction between the type of clue and the generation, F(4, 303) =450 3.38, p = .01,  $n^2 = 0.04$ . The interaction can be visualized in Figure 2. 451

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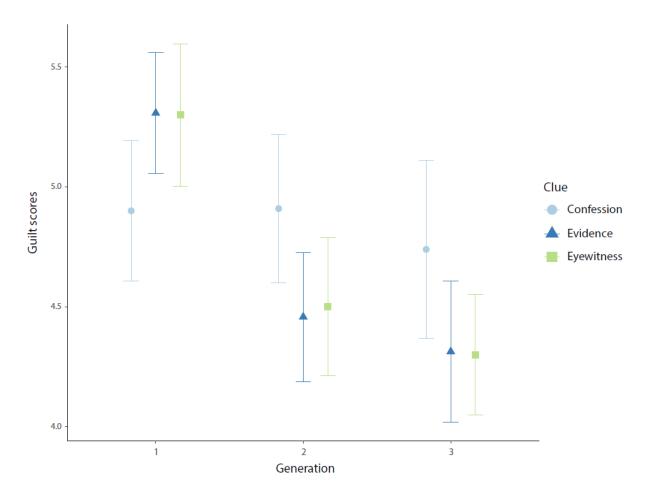


Figure 2. Effect on guilt ratings of the interaction between the generation and the nature of the clue presented to the participants, for participants who received at least the central element of the justification. The full range of guilt rating is [1-7].

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

466 Finally, we compared the guilt ratings of the first and third generations. In the Confession Condition, there was no significant difference between the guilt ratings of the first generation (M 467 468 = 4.9, SD = 0.93) and of the third generation (M = 4.74, SD = 1.18). Welch's t (37.84) = 0.56, p469 = .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 = 0.00474 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. 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

circumstantial evidence, lost less of its convincingness in the process of repeated transmission.

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

### **Modeling**

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

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

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

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

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.

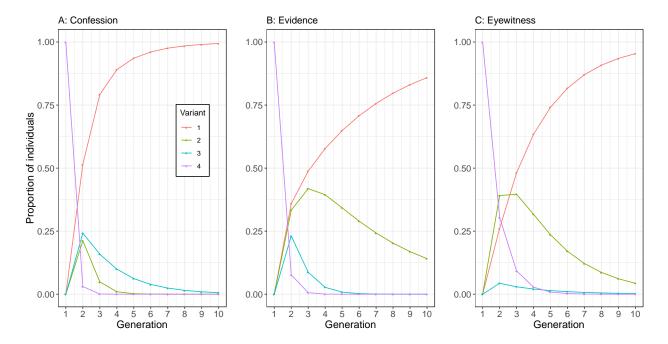


Figure 3. Simulation of the evolution of the variants of each of the justifications. The parameters were chosen based on the results of Experiment 1. The initial proportions correspond to the case

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

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

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

### **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.
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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	
86	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 $t(92) = 3.08$ , $p =$

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

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

#### Conclusion

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

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experimental data, and modeling.

of the justification, as long as the central element (i.e. the confession itself) was retained. Indeed, in some cases the loss increased the convincingness of the justifications, when it was the mention of potential police pressures that was omitted. Modeling showed which types of justifications would be more common after repeated transmission, and the results of Experiments 1 and 2 show that the most common variant of the justification based on confessions was more convincing than the most common variants of the justifications based on eyewitnesses or circumstantial evidence. Our experiments have several limitations. First, the convincingness of the confessions was lowered by the mention of potential coercion, an element that could be specifically manipulated in further experiments. Second, we only used a small set of vignettes, which are obviously far from covering the full range of types of justifications for verdicts. Third, the experiments were only conducted in one cultural group, and ought to be replicated in other settings. The stress put on confessions in many judicial systems is theoretically puzzling—i.e. it is not obvious why it should exist—and practically relevant—given that it brings in its wake very problematic features, from torture to false confessions. Our results show that ease of transmission might be one element that compounds the intrinsic convincingness of confessions, making them particularly suited for legitimizing judicial decisions. The present study also show that some light can be shone on such matters by combining a variety of methods: analysis of the

historical record (showing, e.g., the explicit importance of legitimacy for medieval jurists),

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