

Laypeople's criteria for the discrimination of reliable from non-reliable eyewitnesses

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Abstract

This study aims to determine the subjective and objective indicators that influence the perceived reliability of eyewitnesses. For the reliability assignment task of two eyewitnesses whose identification was incompatible, a total of 200 subjects evaluated the testimonies using the different formats described in the literature for assessing credibility. The results indicate that subjects were able to use objective indicators which have been reported to be robust in the literature with certain precision; notwithstanding, they also resorted to less reliable indicators. Nevertheless, under a "free narrative account interview", subjects tended to resort to several criteria: legal, scientific, content analysis, and nonverbal behaviour indicators. Finally, recommendations for improving the subject's (in legal contexts, the potential decision-maker's) performance in discriminating reliability are discussed.

Keywords: Credibility, reliability, eyewitness, line-up, judgement-making, mock-jurors, potential judges.

Title: Laypeople's criteria for the discrimination of reliable from non-reliable eyewitnesses.

Introduction

The models of information integration (e.g., Wigmore, 1935; Kaplan and Kemmerick, 1974; Kaplan, 1975; Kaplan, 1977; Kaplan, Steindorf, and Iervolino, 1978; Ostrom, Werner and

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Saks, 1978; Hastie, Penrod and Pennington, 1983) have identified two underlying dimensions of judgement-making i.e., reliability and validity. In the context of legal judgement-making, the former is generally associated to credibility of the testimony, and the latter to the weight of the evidence. Both dimensions have shown to be of great value and universal in the creation and prediction of narrative events in judgement-making by both experts and laypeople. In short, recent research (e.g, Arce, Fariña and Real, 2000) has revealed that reliability conferred to the different items of evidence mediates judgement-making in such a way that the evidence becomes polarised into two constellations i.e., one driven to guilt and the other to a not guilty verdict. This effect has been observed in jurors (Fariña, Fraga and Arce, 2000) and in judges (Arce et al, 2001). For example, in a case of rape the verdict frequently rests on the credibility assigned to the victim's or aggressor's testimony. Thus, if credibility is assigned to the victim, a guilty verdict will be reached or vice-versa. Moreover, gender has also found to mediate in the assignation of credibility in cases of rape (Arce, Fariña and Fraga, 2000). In other words, the assignation of credibility and validity of testimonies may bias judgement-making. Furthermore, research on metamemory and assignation of credibility underline that we overestimate our own and each others memory capabilities, and confer a considerable degree of reliability to eyewitness accounts, in particular those leading to a guilty verdict (McAllister and Bregman, 1986).

The two most prominent approaches to the evaluation of the credibility, reliability or perceptions of accuracy of judicial testimonies are based on legal and scientific criteria. According to legal doctrine, the reliability of a testimony is determined by the opportunity to observe (the ability to have observed the events, etc.), bias (control over possible interests), credit, temporal and inter-witnesses consistency, and plausibility (Wigmore, 1937; Schum, 1977; Hastie, Penrod and Pennington, 1983). From a scientific point of view, Wells and Lindsay (1983) confirmed by metanalysis that the inferences of accuracy included three types of information: variables to evaluate (phenomenology of the situation, encoding processes, and information retention), consistency (inter- and intra-testimonies), and biased responses (e.g., confidence). Likewise, two effective research tools for estimating the credibility of testimonies have been designed: one based on the verbal characteristics of the testimony (e.g., CBCA, and Reality Monitoring), the other relies on non-verbal behavioural analysis (see Vrij, 2000 for a review). In the assessment of credibility, however, people may resort to the use of subjective indicators, i.e., subjective models instead of the objective indicators i.e.,

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objective models, reported in the literature, regardless of whether such behaviour is an accurate or reliable indicator of deception (Vrij, 2000). Furthermore, in judgement-making tasks, jurors have been found to be mediated in the assignation of credibility by variables such as attitudes towards the death penalty (Cowan, Thompson and Ellsworth, 1984), political attitudes, or gender (Fariña et al., 1999). Consequently, in order to estimate the consistency of a testimony three terms have been used in the literature: reliability, credibility and inferences of accuracy, according to whether the task refers to judgement making, evaluation of the credibility of a statement, and the perception of the accuracy of eyewitness identification. Nevertheless, these concepts share similar underlying mechanisms e.g., opportunity to observe, consistency in the statement).

Bearing in mind that the estimation of the credibility, reliability and the perception of accuracy of a testimony is a key point for judgement-making, this study aims to assess the criteria used by laypeople to assign reliability to the identification of two conflicting eyewitness testimonies on the bases of their statements. Moreover, we evaluate the scientific criteria for estimating credibility/reliability and the degree to which laypeople adequately employ the scientific criteria described in the literature, i.e., non-verbal behaviour and statement content analysis.

Method

Subjects

A total of 200 subjects, mainly university students (70.4%) were selected, of which 34.7% were men and 65.3% women. The age ranged from 18 to 76 years with a mean age of 24.68 years and a standard deviation of 11.01.

Material

The material used was a police video recording of two eyewitness accounts of a real-life case of robbery. The statements of the eyewitnesses were obtained using the cognitive interview procedure, and eyewitness identifications in the line-up were incompatible.

Procedure and design

The subjects were shown a police video of the conflicting statements of two real eyewitnesses, that is, they had identified two different suspects. Thereafter, subjects were asked to complete a questionnaire in which they had to:

- Decide which of the two testimonies was the most reliable, credible or accurate.
- Explain, in response to an open-ended question, why they believed one of the witness's testimonies was reliable and the other was not.
- Independently evaluate the behaviour and the testimony of both witnesses using a questionnaire designed for this task (see "*measurement variables*").

Measurement variables

Bearing in mind the objectives of this study, a battery of questions was designed to evaluate the following measurement variables:

- 1) First, using a one option only format, subjects had to select which of the two testimonies was reliable.
- 2) Thereafter, subjects underwent a "free narrative account interview" where subjects were required to motivate their reasons for considering one testimony as reliable and the disregarding the other. This interview was recorded on video.
- 3) The list of possible measurement variables of non-verbal behaviour indicative of deception is so extensive that only the measurement variables that have been reported in the literature as being objective and subjective indicators of lying were included in the study (Vrij, 2000). In order to ensure that these categories of analysis were present in the questionnaire, 10 experienced encoders classified the material into the 17 categories of the study using the procedures described by Thurstone. In this way, unproductive categories

of analysis that were not detected in the material by at least one of the encoders were eliminated from the questionnaire. A total of 10 categories were found to be productive i.e., illustrator movements, smiling, gaze aversion, self-manipulations, high-pitched voice, speech hesitations, speech errors, speech rate, latency period, and hand and finger movements.

- 4) Content analysis criteria related to credibility i.e., C.B.C.A. were also evaluated (Steller and Köhnken, 1989). Similarly, 10 experienced encoders classified the 19 categories of the CBCA using the Thurstone procedure for classifying the material as productive or not. A total of 7 categories were found to be unproductive: accurately reported details misunderstood; pardoning the perpetrator; details characteristic of the offence; related external associations; accounts of subjective mental state; raising doubts about one's own testimony.

Analysis of protocols

Protocols related to motives of reliability or no reliability underwent content analysis in order to identify them. A reliable and valid mutually exclusive category system was designed, what Weick (1985) has labelled as a methodic category system. The categories were designed following the procedures outlined by Anguera (1990). The categories under analysis and their corresponding definitions were as follows:

- Gaze aversion: Looking at the face of the conversation partner.
- Length of the statement.
- Speech hesitations: Use of the words "ah", "um" and so on.
- Lack of consistency with laws of nature.
- Structured account: Organised account of events.
- Clarity: Clarity, definiteness, specification, and vividness of the statement instead of dim and vague comments.
- Plausibility: Logical, coherent, and consistent account.
- Objective meta-statement: The witness describes what he saw and knows (facts), subordinating the interpretation to the facts.
- Authenticity: Degree to which the witness seems natural and relaxed.

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- Confidence: The conviction in his/her testimony, being sure about what s/he saw, and gives a convincing testimony without showing signs of doubt.
- Conditional information: Exposure time, distance from the scene of the crime, was not distracted at that time.
- Contextual embedding: The witness's ability to set an action in a specified time and space.
- Psychological processes: Witness's ability to pay attention (focusing on the facts), perception (i.e., I saw, heard), and recall.
- Impression: Impression that the witness "seemed better", "more sincere", "more reasonable".
- Statement focused on the facts: The testimony focused on the facts and events, without mentioning unrelated facts.
- Amount of details: The number of details provided by the witness's testimony.

Reliability

Two encoders underwent exhaustive training prior to the encoding of the protocols, and were previously required to compare their encoding of protocols with other pattern codings that were not part of this study. The agreement index was taken as the contrastive procedure designed to correct bias in the pre-encoding stage. Moreover, one of the encoders had previous experience in other studies where the same procedure had been used (Jólluskin, 2000).

Thereafter, both encoders analysed the protocols (each encoding 50% of the sample responses). A week later each encoder encoded 10% of their own responses and 10% of the other encoder's protocols.

In order to evaluate the within- and between-encoder consistency a concordance index was used with cut-off point of .80 (Tversky, 1977). The results obtained are shown in Table 1.

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The results show that the data are within- and between-encoder consistent. Moreover, our encoders have also shown to be reliable in other studies (Jólluskin, 2000). Bearing in mind the within- and between-encoder consistency, the inter-studies consistency of the encoders, and the categorical system reliability, we can conclude that the input data is reliable (Wicker, 1975).

Table 1. *Within- and between-encoder consistency. Concordance Index (CI).*

Variable	B-1/2	B-2/1	W-1	W-2
Psychological processes	1.00	0.80	1.00	1.00
Confidence	1.00	1.00	1.00	1.00
Conditional information	1.00	1.00	1.00	1.00
Amount of details	1.00	0.90	1.00	0.90
Speech hesitations	1.00	1.00	1.00	1.00
Gaze aversion	1.00	1.00	1.00	1.00
Clarity	0.80	0.90	1.00	0.90
Objective meta-statement	1.00	0.90	1.00	1.00
Structured account	1.00	1.00	1.00	1.00
Statement focused on the facts	1.00	1.00	1.00	1.00
Contextual embedding	1.00	1.00	1.00	1.00
Length of the statement	1.00	1.00	1.00	1.00
Authenticity	1.00	1.00	1.00	1.00
Lack of consistency with laws of nature	1.00	1.00	1.00	1.00
Impression	1.00	1.00	1.00	1.00
Plausibility	1.00	1.00	0.90	1.00

Note: CI= Agreements / (agreements + disagreements) X 100. B-1/2= Concordance index between-encoders 1 and 2 from the material of encoder 1; B-2/1= Concordance index between-encoders 2 and 1 from the material of encoder 2; W-1= Concordance index within encoder 1; W-2= Concordance index within encoder 2.

Results

Nonverbal Behaviour (Vrij, 2000)

The multivariate contrasts reveal that the reliability factor (“reliable witness vs. not reliable witness”) mediates significant differences in nonverbal behaviour, $F(10,261)=7.350$; $p<.001$; $T.E.=.220$. In other words, laypeople base reliability judgement-making on nonverbal behaviour.

Univariate analysis (see Table 2) show that lay assign credibility to those witnesses with fewer hand and finger movements, high speech rate, fewer smiles and speech hesitations and speech errors, with a low tone of voice, and a shorter latency period.

In short, laypeople link reliability, in line with the objective indicators, to a higher speech rate); fewer speech hesitations, fewer speech errors (repetitions of words and/or sentences, incompletions, slips of tongue); and fewer high-pitches of voice. Nevertheless, their interpretation may differ from the objective indicators (Vrij, 2000) by assigning value to reliability to control of non-functional hand and finger movements without moving arms, though the control of these movements is an objective indicator of unreliability. Likewise, smiling and laughing are not objectively evaluated by laypeople given that they are associated to little reliability, but objective models inform that there is no relation with the reliability of testimony. Moreover, illustrator movements, self-manipulations, gaze aversion, and latency periods are not considered by laypeople in assigning reliability; though this is not to say that these criteria are not taken into account in other contexts.

Table 2. *Univariate effects in Non-Verbal Behaviour.*

Variable	MS	F	p	Eta ²	M _{re}	M _{nre}
Illustrators	.88	.22	.638	.001	4.64	4.53
Hand and finger	18.08	5.19	.023*	.019	3.1	3.62
Self-manipulations	.251	.08	.778	.000	4.01	4.08
Speech rate	124.77	52.73	.001***	.163	4.63	3.28
Smiling	19.46	7.96	.005**	.029	3.1	3.56
Speech hesitations	35.23	9.23	.003**	.033	3.63	4.35
Gaze aversion	6.252	1.88	.172	.007	3.22	3.53
Speech errors	36.34	13.01	.001***	.046	3.21	3.94
High-pitched voice	43.92	13.	.001***	.046	2.99	3.79

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Latency period 4.47 2.2 .139 .008 2.35 2.61

Note: D.F.(1,271). ***p< .001; **p< .01; *p< .05. M_{re} = Mean of reliable eyewitness;

M_{nre} = Mean of not reliable eyewitness.

In short, nonverbal behaviour is a useful parameter for laypeople in estimating the reliability of testimonies. However, though it may be of value for assessing reliability, this does not imply that they are used correctly i.e., in line with objective models described in the scientific literature.

Criteria Based Content Analysis (Steller and Köhnken, 1989)

The existence of significant differences in the *Content Analysis Based on Criteria* (Steller and Köhnken, 1989) mediated by the reliability assignation factor (reliable witness vs. not reliable witness) was verified, $F(12, 331) = 7.465$; $p < .001$; T.E.=.213.

The univariate effects (see Table 3) reveal that the testimony of reliable witnesses is perceived as being well set in time and space; makes more references to the perpetrator's mental state; provides more detailed descriptions of people and places; describes in greater depth social interaction; and the accounts are logically structured. In contrast, the testimony of not reliable witnesses show more lacks of memory and spontaneous corrections.

Table 3. *Univariate effects in CBCA criteria.*

Variable	MS	F	p	Eta ²	M_{re}	M_{nre}
Logical structure	100.67	37.85	.000***	.100	5.19	4.11
Amount of details	216.18	58.18	.000***	.145	4.89	3.3
Contextual embedding	104.11	38.32	.000***	.101	4.85	3.75
Descriptions of interactions	18.64	5.33	.022*	.015	3.47	3.01
Reproduction of conversations	3.24	.69	.406	.002	3.32	3.12
Unespected complications	10.43	2.79	.096	.008	3.68	3.33
Unusual details	.17	.05	.817	.000	3.3	3.25
Superfluous details	.01	.01	.981	.000	3.4	3.4
Perpetrator's mental state	29.29	9.33	.002**	.027	3.01	2.42

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Spontaneous corrections	30.86	9.29	.002**	.026	2.71	3.31
Admitting lack of memory	97.16	24.33	.000***	.066	3.13	4.19
Self-depreciation	.24	.08	.779	.000	2.52	2.47

Note: D.F.(1,343). ***p< .001; **p< .01; *p< .05. \underline{M}_{re} =mean of reliable eyewitness; \underline{M}_{nre} =mean of not reliable eyewitness.

Table 4. *Lay criteria of reliability.*

Variables	N° (%)	Z
Focused on the facts	3 (1.5%)	-2.27
Clarity	29 (14.5%)	6.17*
Amount of details	103(51.5)	30.19*
Structured account	2 (1%)	-2.6
Inconsistent with the laws of science	4 (2%)	-1.94
Length of the statement	1 (0.5%)	-2.92
Location in time and space	1 (0.5%)	-2.92
Speech hesitations	4 (2%)	-1.94
Gaze aversion	1 (0.5%)	-2.92
Impression	23 (11.5%)	4.22*
Objective meta-testimony	16 (8%)	1.94
Conditional information	44 (22%)	11.04*
Plausibility	23 (11.5%)	4.22*
Psychological processes	35 (17.5%)	8.12*
Confidence	60 (30%)	16.22*
Authenticity	45 (22.5%)	11.36*

Note: * the number of case observed is greater p<.001 than expected (.05).

Briefly, Criteria Based Content Analysis is sensitive to the reliability assigned by laypeople which coincides with empirical predictions. Nevertheless, the univariate effects indicate that not all of the variables were relevant and, contrary to the scientific predictions of the objective model, the admission of lack of memory and spontaneous corrections are linked to an unreliable testimony. This lack of consistency with the empirical findings has also been reported in other studies (e.g., Biland, Py and Rimboud, 1999).

Lay criteria of reliability

Table 4 shows the criteria mentioned by laypeople to an open-ended question concerning their reasons for assigning reliability or not. The data reveal that laypeople use multiple criteria including criteria pertaining to content analysis of the statement (e.g., amount of details, logical structure), non-verbal behaviour criteria (e.g. vocal characteristics and non-vocal), criteria (e.g., plausibility), scientific criteria (e.g., conditional information and psychological processes), metamemory (confidence), testimony validity criteria (inconsistent with the laws of science).

Nevertheless, the fundamental criteria, that is, those who significantly exceed the critical value of 5% of the motives, reduce the number, of a initial total of 16, the next 8:

- Clarity: Clarity and vividness of the testimony (criteria of the content of the testimony).
- Confidence: the witness's conviction during the testimony, that is, the witness is sure what s/he saw, and made a convincing testimony without doubting (scientific criteria of metamemory).
- Amount of details: quantity of details during the testimony (content criteria of the testimony).
- Impression: Impression that the eyewitness was "better", "more sincere", "more reasonable" (criteria of nonverbal behaviour referring to personality of the speaker).
- Conditional information: exposure time, distance from the crime scene, not distracted at the time of the crime (scientific criteria for estimating variables, legal criteria of opportunity)
- Plausibility: logical structure, coherence and internal consistency of the account (legal criteria of plausibility, content criteria of logical structure, scientific criteria of reconstructability of the story).
- Psychological processes: ability to pay attention (focused on the facts, distraction), perception (i.e., I saw, heard) and witness recall of events (scientific criteria for estimating variables).
- Authenticity: relaxed or tense witness (criteria of nonverbal behaviour centred on nonvocal characteristics).

It is worth noting that in free recall tasks, subjects remember the most prominent information and they do so in a scale of importance (Loftus et al., 1992) which mediates judgement-making. According to our findings laypeople in discrimination tasks of reliable or unreliable witnesses rest judgement-making on several criteria: legal, scientific, content analysis, and nonverbal behaviour. The objective value of the scientific, legal, content analysis and nonverbal behaviour criteria has been well documented in the literature. Moreover, most of the criteria are properly used i.e., in line with the predictions of objective models, notwithstanding some exceptions such as the witness's confidence in his/her testimony that is interpreted as a sign of reliability. Yet, it is well known that confidence and accuracy are not synonymous. Similarly, the nonverbal behaviour criteria used by laypeople to discriminate are not considered by the literature to be objective indicators of reliability. In fact, the authenticity can lead to the "Othello Error" (Ekman and O'Sullivan, 1989), and the relationship between impressions of reliability and accuracy is imprecise (Riggio and Friedman, 1983). Furthermore, these strategies are closely associated to bias in judgement-making which involves more than the implicit knowledge of laypeople about their own and others memory (Wells and Lindsay, 1983; Lindsay et al., 1986).

Discussion

It is worth pointing out that care should be taken concerning the generalisations inferred from the findings. First, this study performed on mock decision makers who do not have to perform as real ones (Fariña et al., 1994). Second, the empirical models applied i.e., Non-Verbal Behavior and CBCA, were specifically designed to measure lying and deception of a victim's statement, and not eyewitness reliability in an identification task as was the purpose of this study. Third, the measures of the scientific criteria were drawn from a recognition task but this does not imply it is of value in the laypeople's evaluation of eyewitness reliability. Fourth, given that laypeople and legal experts are said to perform the same task in the evaluation of the reliability of an eyewitnesses testimony, universality in the estimation of reliability can be assumed, which supposes that the data may be generalised to legal experts (Schooler, Gerhard and Loftus, 1986).

Bearing in mind these limitations, the results obtained enable us to draw the following conclusions:

- a) Laypeople are able to recognise with a degree of reliability the scientific criteria of nonverbal behaviour linked to the reliability of a testimony.
- b) Likewise, laypeople can recognise with a high degree of accuracy the objective interpretation of the content criteria outlined in the CBCA designed for the discrimination of reliable from non reliable witnesses.
- c) Content analysis models of testimonies and of nonverbal behaviour are generally valid from laypeople's point of view if and when they are provided with the criteria.
- d) Without guidelines, laypeople rest their judgement-making on several criteria such as content criteria, scientific criteria, legal criteria, and non-verbal behaviour. Furthermore, most of the criteria they use are in line with the predictions of objective models. However, they perform the task with other valueless unempirical criteria, referred to as subjective indicators.

Consequently, it is possible to train subjects to use objective indicators of content analysis and nonverbal behaviour in judgement-making. Under the assumption that it is possible to correct informal judgement-making, judges, jurors and other legal decision makers may be trained to mitigate their metacognitive deficits which have been identified as the main source of informal reasoning (Perkins, 1989). That is, once they are made aware of the subjective indicators they have used in judgement-making, it is expected they employ selfcorrection towards objective indicators.

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