

The Effect of Administrator Knowledge on Eyewitness Decision-Making and Confidence

Assessment in a Simultaneous Line-up Procedure

Cody Palumbo

University of Adelaide

This thesis is submitted in partial fulfilment of the Honours degree of Bachelor of

Psychological Science (Honours)

Word Count: 8953

Contents

List of Figures	5
List of Tables.....	9
Abstract	11
Declaration.....	12
Acknowledgments.....	13
1.1.0 Introduction.....	14
1.1.1 Background	14
1.1.2 Estimator and System Variables.....	14
1.1.3 Administrator Knowledge Effects.....	15
1.1.4 Eyewitness Confidence and Administrator Knowledge effects	16
1.2.0 Study Methodology.....	17
1.2.1 Replication of Previous Methodology	17
1.3.0 Current Research and Present Study Predictions.....	19
1.3.1 Administrator Knowledge Effects on Witness Identification-Decision	
Propensity	19
1.3.2 Administrator Knowledge Influence – Witness Confidence Interaction	20
1.3.3 Study Hypotheses.....	23
2.0.0 Methodology	24
2.1.0 Design	24
2.2.0 Participants.....	24
2.3.0 Materials	24

2.3.1 Videotaped Mock Theft	24
2.3.2 Self-Reported Perception of Administration Bias Measure.....	25
2.3.3 Self-reported Items Assessing Witness Ratings of Memory Accuracy.....	25
2.3.4 Line-up Administrator Training-Video	25
2.3.5 Photo-array.....	26
2.3.6 Administrator to Witness Line-up Instructions, Confidence Rating, and Decision-Style.....	26
2.3.7 Behaviour Coding Scheme	27
2.4.0 Dependent Measures	27
2.5.0 Procedure	28
3.0.0 Results.....	31
3.1.0 Data Analysis & Screening	31
3.1.1 Hypothesis Tests	31
3.2.0 Manipulation Checks	32
3.3.0 Test of Hypothesis 1.....	34
3.3.1 Bayesian Binomial Test Analysis.....	34
3.3.2 Evaluation of Test	34
3.4.0 Test of Hypothesis 2.....	39
3.4.1 Bayesian Independent Samples T-Test.....	39
3.4.2 Evaluation of Test	40
3.5.0 Test of Hypothesis 3.....	42
3.5.1 Bayesian Pearson Correlation Test	42

3.5.2 Evaluation of Test	42
4.0.0 Discussion	47
4.1.0 Research Findings	48
4.2.0 Strengths and Limitations of Research	52
4.3.0 Future Research Directions and Practical Implications	55
4.4.0 Conclusions	56
References	58
Appendix A	65
Appendix B	68
Appendix C	69
Appendix D	70
Appendix E	72
Appendix F	73
Appendix G	79

List of Figures

<i>Figure 1.</i> Selection Cue Integration Framework as represented by Charman et al. (2010).....	19
<i>Figure 2:</i> Posterior and Prior distribution plotting of correct and suspect identifications of the Single-blind condition. Bayes Factor and the updated median for the effect size range with corresponding 95% CI is also indicated.....	34
<i>Figure 3:</i> Posterior and Prior distribution plotting of rejections and foil identifications of the Single-blind condition. Bayes Factor and the updated median for the effect size range with corresponding 95% CI is also indicated.....	35
<i>Figure 4:</i> Posterior and Prior distribution plotting of correct and suspect identifications of the double-blind condition. Bayes Factor and the updated median for the effect size range with corresponding 95% CI is also indicated.....	36
<i>Figure 5:</i> Posterior and Prior distribution plotting of rejections and foil-identifications of the double-blind condition. Bayes Factor and the updated median for the effect size range with corresponding 95% CI is also indicated.....	37
<i>Figure 6:</i> Posterior and Prior effect size distribution plotting. Bayes Factor and the updated median for the effect size range with corresponding 95% CI is also indicated.....	39
<i>Figure 7:</i> Witness Confidence – Administrator Pressuring Behaviours scatterplot for Single-Blind Condition.	41

<i>Figure 8.</i> Posterior and Prior Witness Confidence - Administrator Pressuring Behaviours population correlation distribution plotting of Double-blind condition. Bayes Factor and the updated median for the effect size range with corresponding 95% CI is also indicated.....	42
<i>Figure 9:</i> Witness Confidence – Administrator Pressuring Behaviours scatterplot for Single-Blind Condition.	44
<i>Figure 10.</i> Posterior and Prior population Witness Confidence - Administrator Pressuring Behaviours population-correlation distribution plotting of the Single-blind condition Witness Confidence. Bayes Factor and the updated median for the effect size range with corresponding 95% CI is also indicated.....	45
<i>Figure 11.</i> Questionnaire with item ratings for measurement of Administrator’s perceived self-biasing behaviour expression.	63
<i>Figure 12.</i> Questionnaire with item ratings for measurement of Witness’s perceived administrator biasing behaviours.....	64
<i>Figure 13.</i> Questionnaire with item ratings for measurement of Witness’s perceived memory-accuracy strength.	65
<i>Figure 14.</i> Extract of the instructions that were provided to the participant administrator to be read to the participant witness, prior to laying out the photo-array.....	66

<i>Figure 15.</i> (A) Images of photos utilised within the study. Photo 1 was the guilty-suspect, and photo 7 was the innocent suspect. Photos 2, 3, 4, 5, and 6 were line-up foils. (B) The 2 x 3 photo-array configuration used within the eyewitness line-up procedure.....	67
<i>Figure 16.</i> Bayes Robustness check for the Bayesian independent samples T-Test comparing witness-confidence across blinding conditions.....	71
<i>Figure 17.</i> Bayes sequential analysis for the Bayesian independent samples T-Test comparing witness-confidence across blinding conditions.....	72
<i>Figure 18.</i> Bayes Robustness check for the Bayesian alternative of the Pearson's-r Correlational analysis of the confidence-pressure relationship within the double-blind condition.....	73
<i>Figure 19.</i> Bayes sequential analysis for the Bayesian alternative of the Pearson's-r Correlational analysis of the confidence-pressure relationship within the double-blind condition.	74
<i>Figure 20.</i> Bayes Robustness check for the Bayesian alternative of the Pearson's-r Correlational analysis of the confidence-pressure relationship within the single-blind condition.....	75

Figure 21. Bayes sequential analysis for the Bayesian alternative of the Pearson's-r
Correlational analysis of the confidence-pressure relationship within the single-blind
condition.76

List of Tables

Table 1. <i>Tests of Normality and Equal Variances</i>	31
Table 2. <i>Coded and Participant Perceived Biasing Behaviours across Blinding Conditions</i>	32
Table 3. <i>Group Descriptive Statistics</i>	32
Table 4. <i>Bayesian Binomial Test: Non-Blinded Administrator Condition</i>	34
Table 5. <i>Bayesian Binomial Test: Blinded Administrator Condition</i>	36
Table 6. <i>Bayesian Independent Samples T-Test: Difference in Confidence Analysis</i>	39
Table 7. <i>Group Descriptive Statistics</i>	40
Table 8. <i>Bayesian Pearson Correlation: Double-Blind Condition</i>	42
Table 9. <i>Bayesian Pearson Correlation: Single-Blind Condition</i>	44
Table 10. <i>Binomial Test of Proportion of Responses</i>	69
Table 11. <i>Independent Samples T-Test for Difference in Confidence across Blinding Conditions</i>	69

Table 12. *Pearson Correlations for Confidence – Pressure Relationship*.....70

Table 13. *Proportions of Decision-Making Styles by Condition*.....71

Table 14. *Proportions of Responses by Condition*.....71

Abstract

Eyewitness misidentification has been determined to be a major contributor to wrongful convictions. Thus, factors that may deleteriously affect eyewitness decision-making have been the focus of extensive research. Moreover, another point of concern is the amplification effects of eyewitness confidence on the perceived credibility of an identification. However, result inconsistencies and inadequate methodologies within literature fail to meaningfully determine the nature of these effects. Therefore, the aim of this study is to examine the effects of administrator knowledge and perpetrator presence on eyewitness decision-making and confidence assessment, in line-up procedures. This study employed a 2 x 2 design, following a double-blind line-up administration paradigm. A mock police simultaneous line-up investigation was replicated from a study by Zimmerman, Chorn, Rhead, Evelo, and Kovera (2017); whereby, two concurrent participants act as either a line-up administrator or an eyewitness. Data analysis was conducted within a Bayesian framework. A correlational analysis determined that pressuring behaviours expressed by a non-blinded administrator decreased the eyewitness's confidence. Further evaluation of the data through a binomial test determined that witness's choosing from the line-up in the non-blinded and blinded conditions, was at a chance rate. Additionally, no difference in confidence between the single- and double-blinded administrator conditions was found for witnesses who possessed weak memory-accuracy for the perpetrator. The pattern of results suggests that administrator pressuring witnesses has the potential to occur regardless of what the administrator knows; highlighting the importance of recording the administration of lineups and witness confidence so that this can be evaluated in court.

Declaration

This thesis contains no material which has been accepted for the award of any other degree of diploma in any University, and, to the best of my knowledge, this thesis contains no material previously published except where due reference is made. I give permission for the digital version of this thesis to be made available on the web, via the University of Adelaide's digital thesis repository, the Library Search and through web search engines, unless permission has been granted by the School to restrict access for a period of time.

Acknowledgments

Firstly, I would like to extend my deepest thanks to my thesis supervisor Dr. Carolyn Semmler, for her invaluable guidance and kindness during my Honours year.

To my partner, Rebecca, who gave unfailing support, love, and continuous encouragement throughout the progression of this thesis. Thank you.

To my friends, many of which have aided me throughout my research, data-collection, and writing of my thesis. I especially want to thank my close friend, Lachlan, whose constant support was much appreciated. Also, to Rachel, for her vital comments and advice towards writing this thesis. Thank you all.

Finally, to my loving mother, for always giving support and care when I needed it most.

My deepest gratitude to you all,

Cody

The Effect of Administrator Knowledge on Eyewitness Decision-Making and Confidence Assessment in a Simultaneous Line-up Procedure

1.1.0 Introduction

1.1.1 Background

Estimates indicate that wrongful convictions constitute 10% of court cases within the United States alone, potentially amounting to more than 200,000 wrongful convictions (Spencer, 2007). The evidence in these cases points to eyewitness misidentification of an innocent suspect as a leading contributor (Connors, Lundregan, Miller, & McEwen, 2015; The Innocence Project, 2017; Wells et al., 1998). Australian cases, such as that of David Eastman and Andrew Mallard, show the fallout of eyewitness misidentification. Eastman was mistakenly identified as the man who purchased the murder weapon at a gun store, subsequently receiving a conviction with life-imprisonment. Mallard was also sentenced to life imprisonment after being wrongly matched to a description given by multiple eyewitnesses of an individual passing the scene of the crime. These cases show the need to research variables that deleteriously influence eyewitness decision-making processes, and artificially inflate witness-identification credibility (Dioso-Villa, 2015).

1.1.2 Estimator and System Variables

Factors which have been determined to affect eyewitness decision-making processes have been divided into system and estimator variables (Wells, 1983). Estimator variables cannot be controlled by administrative procedures, and include exposure period to the crime, or how clearly the individual witnessed the crime (Haw, 2005; Semmler, Dunn, Mickes, & Wixted, 2018). Whereas system variables can be controlled, and are typically the focus of eyewitness research to improve policy surrounding criminal investigative procedures. This includes whether the guilty-suspect is presented within the procedure or not, as well as the

presence of administrator influence, due to knowledge surrounding the investigation (Charman & Quiroz, 2016; Greathouse & Kovera, 2009; J. T. Wixted & Mickes, 2014).

1.1.3 Administrator Knowledge Effects

The effects of administrator knowledge have long been a focus of eyewitness research (Greathouse & Kovera, 2009). An administrator's knowledge and motivations surrounding the suspect's presence within the line-up modifies the way the line-up procedure is administered and consequently influences the identification provided by the eyewitness (Wells et al., 1998). Using a 'double-blinded' paradigm (the administrator and witness are blind to suspect identity) is recommended, instead of the typical 'single-blinded' approach (the administrator is privy to the suspect's identity), to prevent influence (Clark, 2012; Wells, 1988; Wells et al., 1998). Police departments, particularly in the US, are apprehensive about the use of double-blinded procedures due to the concern of overlooking essential evidence, or the impracticality of locating an officer who is not privy to the investigation (Rodriguez & Berry, 2013).

The impact of administrator knowledge can be understood by the theory of interpersonal-expectancy effects. Unconscious bias (e.g. non-verbal cues) results in the participants aligning their response to what is expected, or anticipated, by the experimenter (Kovera & Evelo, 2017; Rosenthal, 1994; Zimmerman, Chorn, Rhead, Evelo, & Kovera, 2017). Rosenthal and Fode (1963) examined the effect of an experimenter's expectancy on a participants' appraisal of photos as being successful or unsuccessful, and results indicated that participants' response aligned with the knowledge of the experimenter. Such expectancy effects have been found within a range of circumstances including interrogation rooms and courtrooms (Halverson, Hallahan, Hart, & Rosenthal, 1997; Kassin, Goldstein, & Savitsky, 2003). Another study by Rosenthal and Rubin (1978) examined an effect of interpersonal expectancy in various research domains, including psychophysical judgements. Accordingly, individuals in positions of authority can bias those subordinate to them, such as experiment participants, eyewitnesses,

jurors, or suspects within an interrogation. Various studies have been conducted to determine expectancy effects in eyewitnesses (Clark, 2012; Perlini & Silvaggio, 2007; Steblay, Dysart, Solomon, & Lindsay, 2001; Steblay, Wells, & Douglass, 2014).

However, the literature surrounding administrator influence and potential moderating effects has been inconsistent. A study by Perlini and Silvaggio (2007) indicated that a non-blinded administrator effects eyewitness decision-making within a sequential (photos presented individually) line-up, but not within a simultaneous (photos presented concurrently) line-up. Such results are contradictory to research by Greathouse and Kovera (2009), and Haw and Fisher (2004), who report results indicating that non-blinded administrators will effect eyewitnesses within simultaneous line-up, more so than a sequential line-up. Furthermore, studies exist indicating that neither blinded administrators (Garrioch & Brimacombe, 2001) or non-blinded administrators (Perlini & Silvaggio, 2007; Russano, Dickinson, Greathouse, & Kovera, 2006) change eyewitness behaviour. Further research is needed to examine the contradictory results surrounding the effects of administrator knowledge on eyewitness identification, and how perpetrator presence within the line-up may moderate such effects.

1.1.4 Eyewitness Confidence and Administrator Knowledge effects

According to early literature, essential parties in criminal investigations, such as jurors, attorneys, or police officers, regarded confident witnesses as highly credible (Olsson, 2000). However, it was widely believed by policy-makers and researchers that confidence was a weak indicator of identification accuracy (Penrod & Cutler, 1995). Consequentially, policy-changes occurred to prevent reliance on confidence as an indicator of accuracy. A recent study has, however, shown that eyewitness confidence is, in fact, a highly reliable indicator of accuracy, given: (i) the administrator is blinded to the suspect's identity, (ii) the line-up is fair (whereby proportion of identifications across foils were equal), and (iii) the line-ups were either simultaneous or sequential formats (J. T. Wixted, Mickes, Dunn, Clark, & Wells, 2016). While

this study used real-world police investigations, it did not include investigations involving non-blinded administrators. Intuitively, the confidence of an eyewitness upon line-up identification is derived from the evidence strength of the line-up member and their memory of the perpetrator. However, extraneous variables unrelated to the crime produce a different post-identification confidence (Garrioch & Brimacombe, 2001; Luus & Wells, 1994; Wells & Bradfield, 1998). Specifically, confidence fluctuates due to the communication of conscious or unconscious feedback from the administrator, due to their knowledge and expectations. Thus, it is pertinent to examine the interaction between administrator knowledge and witness confidence.

Furthermore, current literature struggles to reconcile the mechanism through which non-blinded administration affects witness confidence (Clark, Brower, Rosenthal, Hicks, & Moreland, 2013). Presently, multiple mechanisms have been proposed that underlie this interaction. Such as, a non-blinded administrator may influence a low-confident witness to make an identification, where the witness would otherwise not identify a line-up member (Greathouse & Kovera, 2009). Contrastingly, recent theories regarding post-identification confidence assessment propose an alternative approach (Charman et al., 2010). Whereby, low-confident witnesses (witnesses with weak internal accuracy-strength) may rely on feedback from a non-blinded administrator, leading to an inflation in confidence (Stebly et al., 2014). Therefore, further research is needed for pre-identification administrator feedback effects on low confidence witnesses, integrated with post-identification feedback, and how this induces confidence inflation.

1.2.0 Study Methodology

1.2.1 Replication of Previous Methodology

Replication of conditions within a study by Zimmerman et al. (2017) will be used as a basis for the current study methodology. Zimmerman et al. examined the effects of administrator knowledge by observing its interaction with witness memory-strength and line-

up format. While predictions surrounding the increased expression of biasing behaviour by a non-blinded administrator were supported, Zimmerman et al. struggled to determine a three-way interaction effect. This can be attributed to the experimental design and the manner of condition manipulation. Therefore, the present study will implement several alterations to overcome these issues.

An issue in the study by Zimmerman et al. was the omission of a 'target-present' condition, arguing that the errors made within 'target-absent' photo-arrays are considered more important. However, this negates the issue of administrator knowledge affecting correct identification rates within a target present line-up. Consequently, this study will include a target-present condition in conjunction with a target-absent condition. Additionally, a simultaneous line-up format will be used exclusively. Prior research has established that sequential line-ups reduce the overall number of identifications (both correct and false identifications) (McQuiston-Surrett, Malpass, & Tredoux, 2006). While sequential line-ups were considered to be superior for a time, later research has elucidated a higher reduction in correct identifications to what was originally found (Lindsay & Wells, 1985). That is, while there is a reduction in false identifications, there is also an undesirably high reduction in correct identifications. Thus, based on this, it is the responsibility of policy-makers to determine whether decreased false identifications at the cost of reduced correct identifications is ethical. Furthermore, using a simultaneous line-up format reduces the overall number of conditions, preventing the dilution of statistical power, as this is another issue within the Zimmerman et al. study (Clark et al., 2013; Greathouse & Kovera, 2009).

1.3.0 Current Research and Present Study Predictions

1.3.1 Administrator Knowledge Effects on Witness Identification-Decision Propensity

According to interpersonal-expectancy effect theory, expectations held by an administrator will cause them to exhibit particular behaviours towards the witness with the witness responding in a manner that is consistent with these expectations (Rosenthal, 1994; Zimmerman et al., 2017). A review by Kovera and Evelo (2017) determined that restriction of an administrator's ability to cue the witness to the location of the suspect, regardless of how this was achieved, reduced the witness's ability to identify them. Furthermore, it was determined that administrators who were not constrained, associated witnesses were more likely to identify the culprit within target-present conditions.

Literature has indicated that non-blinded administrators possess an increased propensity to exhibit biasing behaviours toward the participants. A prominent study by Greathouse and Kovera (2009) found that non-blind administrators would redirect witnesses towards specific images within a line-up if witnesses were uncertain of the identity of the perpetrator, or were about to reject the line-up. Additionally, while the biasing behaviours that non-blinded administrators express increased the number of culprit identifications within target-present conditions, it also increased the rate of innocent-suspect identifications within target-absent conditions (Clark et al., 2013; Greathouse & Kovera, 2009; Rhead, Rodriguez, Korobeynikov, Yip, & Bull Kovera, 2015).

The increase in suspect-identifications is indicative of a liberal criterion shift within the eyewitness. Current literature suggests that biased cues from a non-blinded administrator facilitate a lowering in decision criterion – however, this is yet to be confirmed. A study examining influencing behaviours expressed by an administrator was conducted by Clark, Marshall, and Rosenthal (2009). A reduction in probative value was determined concurrently

with a liberal shift in decision-criterion. A major issue in this study, however, was the non-random allocation of participants into influence conditions. The allocation was dependent on the time taken to respond within the eyewitness identification procedure. Slow participants are likely to have lower memory strength for the perpetrator. The literature indicates that low memory strength results in the participant/witness relying more heavily on external cues to guide their decision (Vela & Smith, 1999). Therefore, participants within the influence conditions were potentially more sensitive to administrator influence. Regardless, results from this study align with previous studies that suggest a reduction in decision-criterion, facilitating an increase in suspect identifications made (Clark et al., 2013; Greathouse & Kovera, 2009). Derived from this, it is predicted that the presence of a non-blinded administrator will increase an eyewitness' propensity to make a suspect-identification, compared to the presence of a blinded administrator.

1.3.2 Administrator Knowledge Influence – Witness Confidence Interaction

Multiple frameworks have been put forth to rationalise mechanisms surrounding witness post-identification confidence reporting. One is the Selection Cue Integration Framework (SCIF), proposed by (Charman et al., 2010). The SCIF posits that a suspect-identifying witness with low memory strength will undergo various stages of cue integration to construct a confidence assessment. The framework stages are outlined in Figure 1 (Charman et al., 2010). The resulting confidence assessment can be artificially inflated due to feedback from a non-blinded administrator. Another model, proposed by Leippe, Eisenstadt, and Rauch (2009), termed the Cue-Belief Model, follows a similar approach. Positing that an eyewitness integrates intrinsic, self -credibility, and extrinsic cues (i.e. administrator biasing behaviours) to evaluate confidence regarding beliefs – beliefs surrounding the overall ability to remember the perpetrator. Essentially, administrator positive (confirmatory) post-identification cues,

whether intentional or not, will bolster self-credibility cues regarding the witness's identification-decision, leading to increased confidence in their identification accuracy.

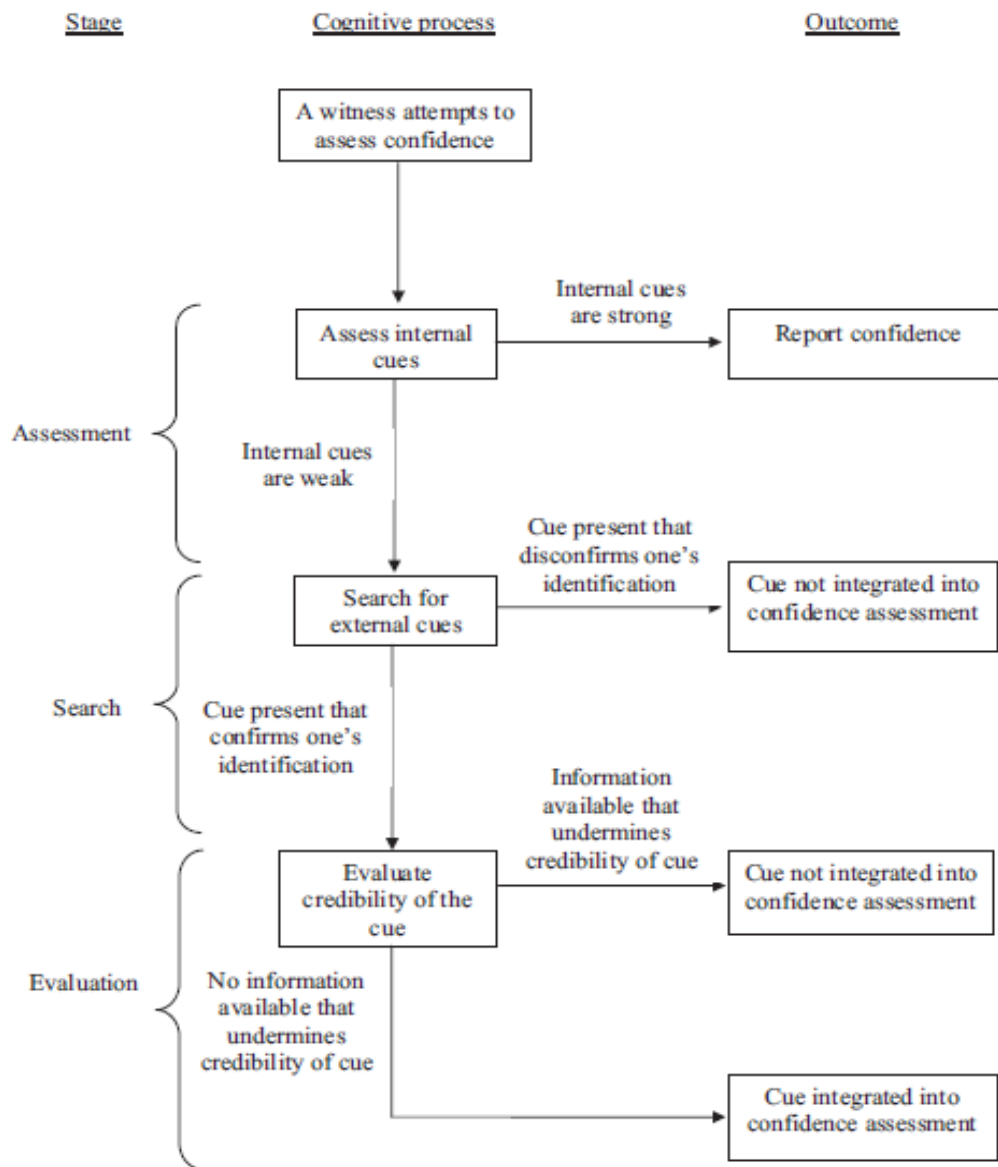


Figure 1. Selection Cue Integration Framework as represented by Charman, Carlucci, Vallano, and Gregory (2010)

Contrasting this approach, another mechanism has been proposed; whereby, the inflation of witness confidence can be predicted based on expectancy effects (Clark et al., 2013; Garrioch & Brimacombe, 2001; Wells & Bradfield, 1998). Cues from a non-blinded administrator will affect a witness with a weak memory-strength to a higher degree than those

with a strong memory (Greathouse & Kovera, 2009; Phillips, McAuliff, Kovera, & Cutler, 1999). Such that a non-identifying witness, due to low confidence, will be influenced by a non-blinded administrator to make an identification. Consequently, the overall pre-identification confidence of a suspect-identifying witness in the presence of a non-blinded administrator should be lower compared to being in the presence of a blinded administrator. An issue with the findings by Greathouse and Kovera (2009) and Phillips et al. (1999), however, is that the lowered confidence trend in non-blinded administrator conditions was typically marginal. Furthermore, indicated differences between single- and double-blinded conditions were not significant. Regardless, in tandem with the cue integration models, this research indicates that a low-memory accuracy witness is more likely to make an identification in the presence of a non-blinded administrator due to pre- and post-identification exhibited expectancy cues. This identification would be reinforced by administrator confirmatory post-identification cues, amplifying the resulting witness confidence assessment. Therefore, the current study will explore post-identification confidence assessment in relation to administrator knowledge. Overall, it can be predicted that increased feedback cues (both verbal and non-verbal) communicated to the low-memory cue witness, by a non-blinded administrator, will result in the inflation of witness confidence.

This approach can be extended to develop a tentative prediction surrounding the pre-identification effects on eyewitness confidence. Literature examining pre-identification pressure on eyewitnesses is severely limited. However, research on how pressure to perform effects self-efficacy provides an insight into the impact of pre-identification pressure on eyewitness confidence assessment. A study by Kiran-Esen (2012) indicates that peer pressure can negatively affect an adolescent's confidence in general and academic capabilities (self-efficacy). Indicating that pressure to unwillingly perform a certain way will reduce an individual's self-efficacy. Extending this to eyewitness identification procedures, the literature

suggests that if the administrator pressures the witness to make an identification, this may have a negative effect on the subsequent confidence assessment. This conclusion is contrary to literature surrounding pre-admonition (a form of pressure to identify) effects on witness confidence (Eisen, Skerrit-Perta, Jones, Owen, & Cedré, 2017; Quinlivan et al., 2016). The presence of pre-admonition suggestion (advice or warning about the possibility of not identifying the perpetrator) increases the witness's confidence in their identification, regardless of target-presence or nature of instruction (biased or unbiased). An issue with these studies, however, is that pre-admonitive suggestion occurs prior to the witness viewing the line-up; this may have primed witnesses to align their subsequent decision with administrators' expectations, therein, not impacting the confidence in their decision. To determine the effect of pressure to choose on the witness confidence, exploratory analysis will be performed within this study to test that if when the eyewitness is pressured to make an identification by the administrator, the resulting confidence assessment will be reduced.

1.3.3 Study Hypotheses

Based upon the literature reviewed above, we made the following primary predictions about the data we would observe: (1) There will be a greater than chance rate of choosing from the line-up (correct identifications and suspect identifications) in the non-blinded condition compared with the blinded condition. (2) There will be a greater level of confidence among inaccurate witnesses in the non-blinded condition compared with the blinded condition. Finally, we will perform exploratory analyses on the following predication: There will be a negative correlation between confidence and the presence of pressure behaviours among witnesses in the non-blinded condition.

2.0.0 Methodology

2.1.0 Design

Participants were randomly assigned to a condition within a 2 (Target Presence: Target present vs. Target Absent) x 2 (Administrator manipulation: Single-blinded vs. Double-blinded) between-subjects design.

2.2.0 Participants

Participants were sampled from the Adelaide region ($N = 104$) through word of mouth, social media, and as a Bachelor of Psychological Science course requirement. Half of the sample was randomly assigned to act as participant witnesses, and the other half acted as participant administrators (61 women, 43 men, $M_{\text{age}} = 26.39$ years). Participants were required to be over 18 years of age, and to speak English fluently. If they possessed a sensory impairment, they were required to have the necessary sensory aids.

2.3.0 Materials

2.3.1 Videotaped Mock Theft

The video depicts a young male individual approaching a house through a side gate, and removing the screening of a window, before entering the house. After approximately eight seconds, the individual re-emerges with a DVD-player. The perpetrator then flees from the scene the same way he entered. The video was recorded from a hand-held recording device and was 29 seconds long, showing the perpetrator's face, either head-on or from an angle, for approximately 13 seconds. The mock crime videotape was produced from a large dataset containing stimulus materials derived from numerous past eyewitness identification studies. This videotape was selected based upon the associated photo-array selection.

2.3.2 Self-Reported Perception of Administration Bias Measure

Administrator bias was measured through a self-reported perception questionnaire, formatted as a 9-item Likert Scale, ranging from 1 (strongly disagree) to 9 (strongly agree). The rating scales were derived from the study by Zimmerman et al. (2017). Both participant administrators and witnesses received a rating scale, the witness measure consisting of 9 items, the administrator measure consisting of 8. All responses were coded to the corresponding scale number; with the exception of items 2, 6, and 9 of the witness scale, and items 2, 4, and 8 of the administrator scale, which were reverse coded. See Appendix A for all measures.

2.3.3 Self-reported Items Assessing Witness Ratings of Memory Accuracy

Similar to the administration bias measure, the assessment of witness memory-accuracy strength was formatted as a 9-item Likert Scale (1 (strongly agree) to 9 (strongly disagree)). Also derived from Zimmerman et al. (2017), this measure is only conducted by the witness and consists of 12 items, and are further coded to corresponding scale number.

2.3.4 Line-up Administrator Training-Video

The simultaneous line-up administration training-video used by Zimmerman et al. (2017) was issued to participant administrators for instruction on the procedures used in eyewitness line-up procedures (Greathouse & Kovera, 2009). The video lasted 1-minute and 53-seconds, whereby a confederate, dressed as a police officer, provided instruction on the basic procedures within a simultaneous photographic line-up procedure. The confederate also conducted a mock line-up procedure with a mock witness. The confederate placed six photographs on the table before the witness in a 2 x 3 configuration. During the mock line-up, the confederate administrator expressed several behavioural cues. During placement of the photographs on the table, the confederate emphasised the placement of the suspect. Further, the witness exhibited more interest in the suspect photograph comparatively to the others, the

confederate focussed on this by questioning the witness if the photograph was recognisable. Finally, the confederate further suggested to the mock witness to view, or imagine, the photograph of interest from different angles, as one may have witnessed the crime from a particular angle. Neither the confederate officer nor the experimenter indicated whether these behaviours were acceptable or not.

2.3.5 Photo-array

The photo-array line-up contained 6 photos; 5 foils and 1 suspect. Overall, there were 5 foils and 2 suspects used within the study; one innocent-suspect and one guilty-suspect. All images depicted mug-shots of young, adult, white, males. Images were produced from the aforementioned dataset and were obtained through a match-to-description method. Stimulus material was selected based upon similar suspect and filler identification, and line-up rejection rates within the high suspect-filler similarity, simultaneous, double- and single-blinded group conditions whom possessed the 30 minute retention period, from the study by Zimmerman et al. (2017). The associated mock-crime video was produced based upon the chosen perpetrator. Selected photos are depicted in Appendix C.

2.3.6 Administrator to Witness Line-up Instructions, Confidence Rating, and Decision-Style

Line-up instructions, eyewitness confidence rating, and recording of decision-style were provided to the administrator on the same form. Instructions were provided to the participant administrators prior to conducting the line-up procedure. The instructions were drawn from the study by Zimmerman et al. (2017), generated within New York State (New York State District Attorney's Association Best Practices Committee, 2011). Instructions read; "As part of the ongoing investigation into a crime we are asking you to view a line-up to see if you recognize anyone involved with that crime." The full instructions are presented in

Appendix B. Administrators also indicated the eyewitness's confidence of their identification decision, anchored to an 11-item Likert Scale (0% (not at all confident) to 100% (completely confident)). The administrators noted the decision-style through matching the witness's decision-process to the following statements: "The perpetrator just popped out at me and I recognised the perpetrator immediately" (coded 0) and "I used a process of elimination when making my identification decision" (coded 1). Confidence and decision-process measurements were derived from Zimmerman et al. (2017). All participants received the same instructions, further the cautionary instruction of whether the perpetrator is or is not in the line-up was omitted.

2.3.7 Behaviour Coding Scheme

Coding of administrator biasing behaviours was completed by a research assistant using a behavioural coding scheme. The behaviours were coded through viewing 49 video tapes, 3 tapes were not useable due to technical malfunction and issues with recording experimental conditions. The scheme consisted of a detailed protocol outlining 48 behaviours to codify, which were divided into pre-identification (30 behaviours) and post-identification (18 behaviours) behaviours. The coder was unaware of research hypotheses and the conditions of each video and interrater reliability (obtained by a second blind coder on 10 randomly selected videos) was good, interrater reliability was 87%. The coding protocol is presented in Appendix G.

2.4.0 Dependent Measures

Upon completion of the line-up procedure, participant administrators recorded whether the participant witness made a filler identification, suspect identification, or a line-up rejection. Administrators also indicated the confidence of the witness's decision, and decision style was also noted. Additionally, a recording of the line-up procedure was taken to code administrator biasing behaviours. Finally, self-report measures (from both the witnesses and the

administrators) of biasing behaviours exhibited by participant administrators were recorded. The witness further reported viewing conditions and identification ease to determine memory-accuracy strength. Self-report measures are presented in Appendix A.

2.5.0 Procedure

Individuals who signed up to participate in the study were randomly allocated to a condition prior to arrival to the laboratory, along with the provision of an ID number to be used throughout the study session. Participants arrived in groups of two to the laboratory, where each participant was randomly allocated to act as either a participant administrator or a participant witness. The experimenter explained to the participants that the purpose of the study was to examine potential factors that may influence the eyewitness decision-making process within line-up procedures. The importance of the study was stressed in relation to improving current knowledge surrounding criminal investigative proceedings within South Australia. Furthermore, the experimenter indicated that the line-up procedure will be audio-visually recorded for the purposes of ensuring correct administration of the procedure in the interest of protecting experimental integrity. It was explicitly made clear that participants were able to decline participation and could withdraw from the experiment at any point. However, it was also made clear that withdrawal from the experiment of either participant resulted in the complete termination of the session and that neither participants were able to re-enter the study. Consent forms from both participants were ascertained prior to the commencement of the session, at which point the participant administrator and witness were separated into different rooms.

Within all conditions, participant witnesses received the same set of instructions from the experimenter. The witness was provided with the videotape of a mock crime. It was stressed that this was not an actual crime, and no one was harmed during its production. The participant witnesses began working on a Raven-Progressive-Matrices (RPM) filler task for 30-minutes

after watching the mock crime. It was not made clear to the witness that the sole purpose of the RPM task was to simulate a real-world delay between witnessing a crime and recognition of the perpetrator.

Participant-administrators were randomly assigned to either the non-blind or double-blind condition. Within all double-blind conditions, administrator participants viewed the training-video, followed by a demonstration by the experimenter on how to conduct the procedure in a simultaneous line-up format. The experimenter indicated that at the commencement of the procedure, they were to read out the provided instructions to the witness. During the demonstration, the experimenter indicated that the photographs be laid out on the table in a 2 x 3 configuration and that the administrator is seated next to the witness. A visual representation of the photo-array configuration is presented in Appendix C. The administrator was told to prompt the witness for a response, the way this was performed was at the discretion of the administrator. The administrator was also urged to withhold the number of the photo that was chosen, from the witness; furthermore, if the line-up was rejected, the administrator was instructed to put a dash in the identification box. Upon completion of the procedure, the administrator was instructed to knock on the door to notify the experimenter. Administrators allocated to the single-blind target present and absent line-ups received identical instructions, however, they were also made aware of which photograph was the suspect.

To simulate a police investigator's motivation within the real-world and to progress through the procedure to find the perpetrator, a reward was given to administrators if their witness identified the suspect (Greathouse & Kovera, 2009). Specifically, the reward consisted of a plain chocolate bar, and the administrator was made of aware of this during the experimenter instruction period. Furthermore, the administrator was strongly urged that the possibility of a reward could not be communicated to the witness at any point throughout the laboratory session.

Upon completion of the 30-minute witness filler task, and all necessary training for the administrator, both participants were reintroduced for the commencement of the eyewitness procedure. During this time, the procedure was set in a separate room to the experimenter, when completed the administrator knocked on the door as instructed. During the procedure, the administrator was required to note down the number of the photographs identified by the witness. Additionally, administrators recorded witness identification decision confidence and decision-process. After the procedure, the participants were separated again, and both were provided with self-report measures consisting of Likert scaled items, which aimed to assess administrator biasing behaviours and memory-accuracy strength. Finally, the participants were reintroduced to be fully debriefed about the main focus of the study and to answer any questions from the participants. Finally, the administrator was rewarded if applicable after the witness participant had departed.

3.0.0 Results

3.1.0 Data Analysis & Screening

All statistical analyses were performed using the free software JASP (JASP Team, 2018). The final sample contained no missing data (total $N = 49$). Frequentist approaches to data analysis require normally distributed data and equality of variances across conditions, particularly for ANOVA. A Levene's test of dependent variables was performed to assess equality of variances. The administrator perceived self-biasing behaviours ($F(1, 47) = 6.826$, $p = .012$) was found to have unequal variance. Finally, a Shapiro-Wilk test was performed to assess normality. This showed that confidence, administrator behaviours, and administrator perceived self-biasing behaviours were not normally distributed, as shown in Table 1. As a Bayesian framework can provide a rich source of information surrounding data with questionable normality and variance equality, it was used for data analysis instead of (frequentist) Null-Hypothesis Significance Testing (Kruschke, 2012). A further advantage to this approach is that the evidence for the null hypothesis can be quantified using a Bayes factor. For completeness and reference, the equivalent frequentist tests are reported in Appendix D.

3.1.1 Hypothesis Tests

To determine whether there would be a greater than chance rate of choosing from the line-up (correct identifications and suspect identifications) in the non-blinded condition compared with the blinded condition (Hypothesis 1), a Bayesian Binomial test was conducted. For Hypothesis 2, a Bayesian Independent Samples t-test was conducted to determine if there will be a greater level of confidence among witnesses in the non-blinded condition compared with blinded condition. Subsequent Bayes robustness check and sequential analysis for evaluation of Hypothesis 2 is presented in Figure 16 and Figure 17 within Appendix F. Finally, an exploratory Pearson's-r analysis was conducted to ascertain whether there was a negative correlational relationship between witness confidence and whether the presence of pressure behaviours from the administrator among witnesses in the non-blinded condition existed.

Figures 18 – 21 presented in Appendix F present Bayes robustness check and sequential analysis for evaluation of Hypothesis 3.

Table 1. *Tests of Normality and Equal Variances*

	W	p
Confidence	0.870	< .001
Witness Perceived Administrator Biasing Behaviours	0.985	0.783
Witness Memory Accuracy	0.975	0.374
Administrator Pressuring Behaviours	0.545	< .001
Administrator Perceived Self-Biasing Behaviours	0.866	< .001 ^a

^a Levene's test is significant ($p < .05$), suggesting a violation of the equal variance assumption

3.2.0 Manipulation Checks

To determine whether the manipulation of line-up administrator knowledge produced the relevant behaviours among administrators and witnesses, a series of Bayesian Independent Samples t-tests were conducted. For all tests, the alternate hypothesis specified that the coded and perceived biasing behaviour levels will be higher within the single-blind conditions compared to the double-blind conditions. The subsequent tests showed that there is insufficient evidence for the alternate hypothesis compared to the null, based on the Bayes Factors presented in Table 2. The descriptive statistics presented in Table 3 also illustrates this conclusion. This indicates that the knowledge manipulation had a negligible effect on the level of biasing behaviours exhibited by the administrators.

Table 2. *Coded and Participant Perceived Biasing Behaviours across Blinding Conditions*

	BF₀	error %
Sum of all Biasing Behaviours	0.157	<0.001
Pressuring Behaviours	0.557	~0.001
Administrator Perceived Self-Biasing Behaviours	0.305	~ 0.013
Witness Perceived Administrator Biasing Behaviours	0.312	~ 0.014

Note. For all tests, the alternative hypothesis specifies that the double-blind group is less than the single-blind group.

Table 3. *Group Descriptive Statistics*

	Group	N	Mean	SD	SE
Sum of all Biasing Behaviours	1	24	1.875	1.801	0.368
	2	25	1.320	1.973	0.395
Pressuring Behaviours	1	24	0.875	1.191	0.243
	2	25	0.600	1.258	2.52
Administrator Perceived Self-Biasing Behaviours	1	24	17.042	8.610	1.757
	2	25	17.280	9.779	1.956
Witness Perceived Administrator Biasing Behaviours	1	24	25.333	8.138	1.661
	2	25	25.640	9.478	1.896

Group 1 = Single-Blinded Conditions

Group 2 = Double-Blinded Conditions

3.3.0 Test of Hypothesis 1

3.3.1 Bayesian Binomial Test Analysis

Through the lens of a Bayesian framework, the Binomial test analyses two binomial proportions to determine if one is greater than the other. The distribution of responses recorded within the present study was binomial, with successes defined as ‘hits’ and failures defined as ‘misses.’ Evaluation of Hypothesis 1 was conducted by collapsing all double-blinded (i.e. double-blinded target-present and double-blinded target-absent) and single-blinded conditions into two variables, respectively. Within this scope, a ‘hit’ is a correct identification (target-present) or a suspect identification (target-absent), and a ‘miss’ is a line-up rejection or foil-identification. Modelling the data through a Bayesian alternative requires the estimation of prior distribution (the anticipated effect size distribution of the present data), which will be implemented in the calculation of a posterior distribution (the updated estimation of the effect size distribution range, given the current data) and the Bayes factor (an estimation of the likelihood of the research hypothesis compared to the null hypothesis) (Halter, 2018). The Null hypothesis refers to the witnesses correctly identifying the suspect at chance levels. The following analyses assumed the Alternate is larger than the Null; the alternative hypothesis specifies the proportion is greater 0.5. Finally, this analysis will utilise a flat non-informative prior distribution (i.e. no prior knowledge is being applied to this analysis) (Halter, 2018; Lee, 2004; Zhu & Lu, 2017).

3.3.2 Evaluation of Test

Preliminary analysis indicated that, across single-blinded conditions, 41.7% of responses were correct or suspect identifications (at Single-Blind Response level 1, or SBR_1 ; misses presented as Response level 2, or SBR_2). However, the calculated Bayes factor, presented in Table 4, for SBR_1 ($BF_{+0} = 0.145$) and SBR_2 ($BF_{+0} = 0.539$) indicates weak evidence for the Alternate hypothesis compared to the Null, following the Bayes Factor

interpretation by Raftery (1995). Plotting of prior and posterior distributions presented within Figure 2 and Figure 3, with subsequent calculation of the Bayes Factor for the Null hypothesis compared to the Alternate for both SBR₁ ($BF_{0+} = 6.887$) and SBR₂ ($BF_{0+} = 1.855$), further supports this conclusion. Indicating that the likelihood of the witnesses identifying the suspect at chance level for SBR₁ was almost 7 times higher than choosing due to the condition effects, and for SBR₂, almost 2 times higher. Finally, Figure 2 and Figure 3 present moderate effect sizes for both R₁ (median = 0.544, 95% CI: [0.502, 0.668]) and R₂ (median = 0.605, 95% CI: [0.507, 0.764]) following effect size interpretation by Wetzels et al. (2011).

Table 4. *Bayesian Binomial Test: Non-Blinded Administrator Condition*

	Level	Counts	Total	Proportion	BF₊
Response	1	10	24	0.417	0.145
	2	14	24	0.583	0.539

Note. For all tests, the alternative hypothesis specifies that the proportion is greater than 0.5.

Response Level 1 = Hits

Response Level 2 = Misses

Once again, preliminary analysis indicated that, across double-blinded conditions, 28.0% of responses were correct or suspect identifications (DBR₁). Similar to the previous binomial analysis, calculated Bayes Factor presented in Table 5 for DBR₁ ($BF_{+0} = 0.078$) indicates weak evidence for the Alternate hypothesis compared to the Null. Contrasting to the previous analysis, however, the Bayes Factor for DBR₂ ($BF_{+0} = 5.292$) positively supports the Alternate hypothesis. However, this provides no evidence to support Hypothesis 1, as it indicates that the witness's choice in rejecting the line-up or incorrectly identifying the foil was

almost 5 times more likely to have not occurred at chance levels, this is also indicated in Figure 5. Contrastingly, Figure 4 illustrates positive evidence ($BF_{0+} = 12.862$) for the likelihood of the Null hypothesis over the Alternate.

Overall, the binomial analysis has determined that there is more evidence for the Null hypothesis than there is for the Alternate, for both the double- and single-blind conditions. This suggests little support for Hypothesis 1.

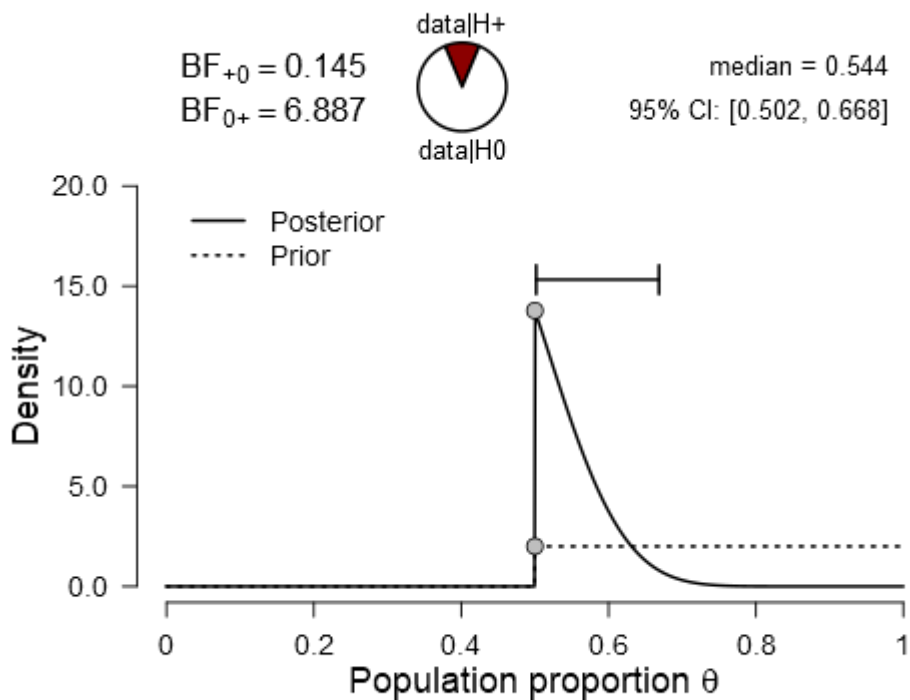


Figure 2: Posterior and Prior distribution plotting of correct and suspect identifications of the Single-blind condition. Bayes Factor and the updated median for the effect size range with corresponding 95% CI is also indicated.

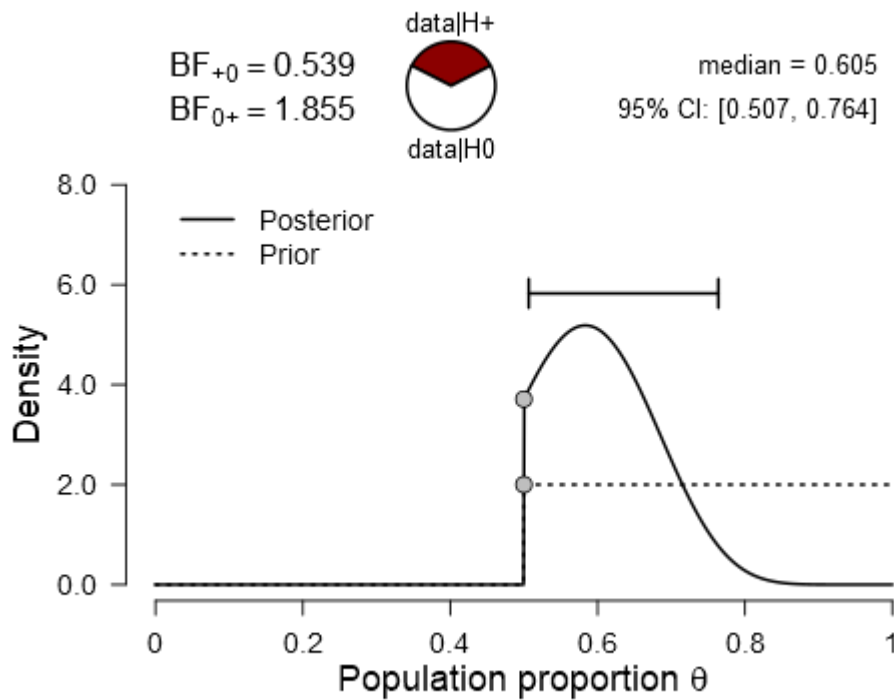


Figure 3: Posterior and Prior distribution plotting of rejections and foil identifications of the Single-blind condition. Bayes Factor and the updated median for the effect size range with corresponding 95% CI is also indicated.

Table 5. *Bayesian Binomial Test: Blinded Administrator Condition*

	Level	Counts	Total	Proportion	BF ₊₀
Response	1	7	25	0.280	0.078
	2	18	25	0.720	5.292

Note. For all tests, the alternative hypothesis specifies that the proportion is greater than 0.5.

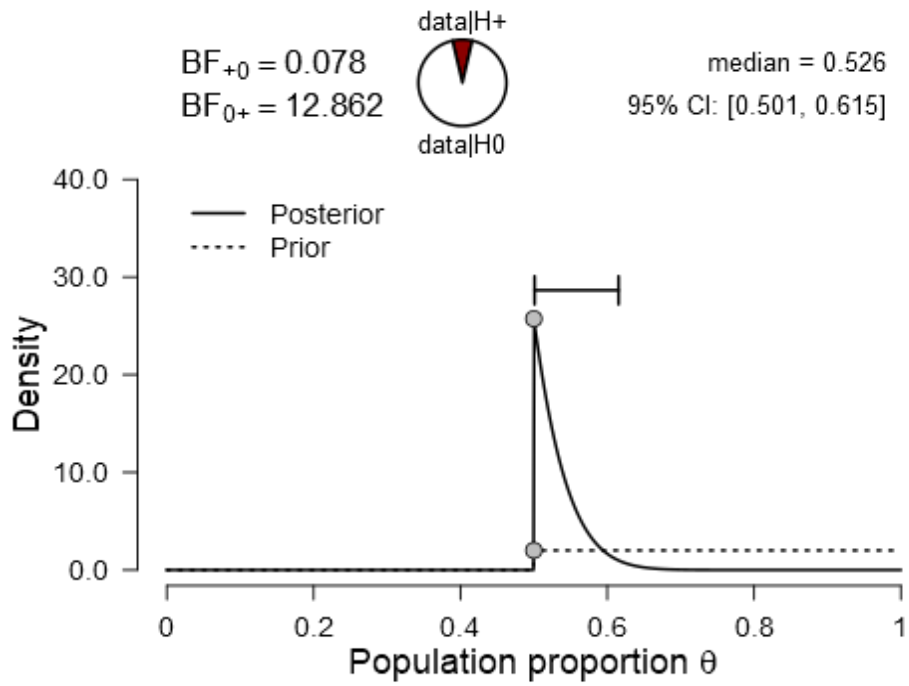


Figure 4: Posterior and Prior distribution plotting of correct and suspect identifications of the double-blind condition. Bayes Factor and the updated median for the effect size range with corresponding 95% CI is also indicated.

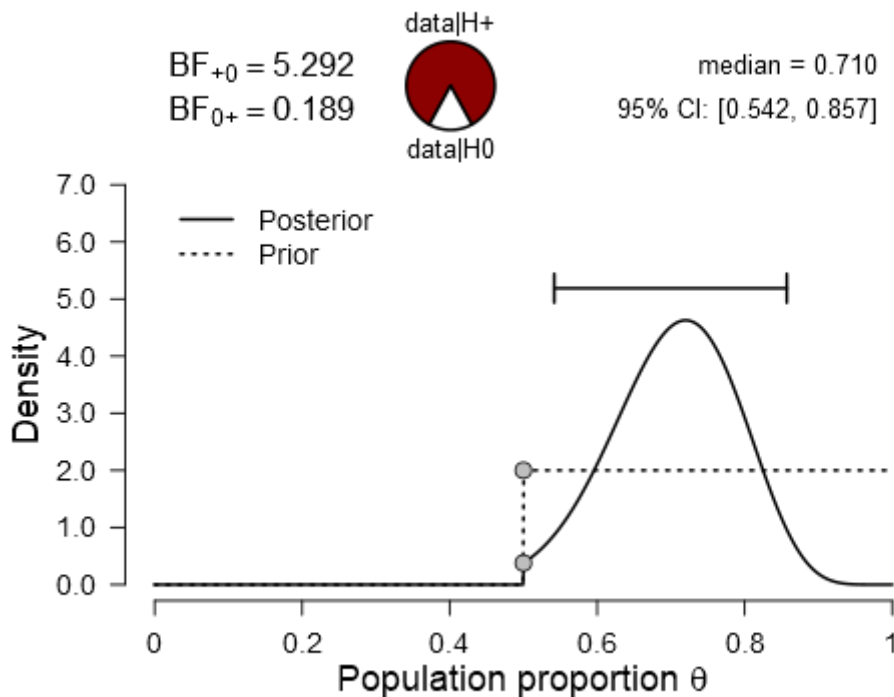


Figure 5: Posterior and Prior distribution plotting of rejections and foil-identifications of the double-blind condition. Bayes Factor and the updated median for the effect size range with corresponding 95% CI is also indicated.

3.4.0 Test of Hypothesis 2

3.4.1 Bayesian Independent Samples T-Test

A Bayesian independent samples t-test was conducted to test Hypothesis 2. Inaccurate witnesses were determined based on placement into measured lower memory-accuracy bin (i.e. scored between 43 and 73 on the Witness Memory-Accuracy Assessment presented in Figure 13 of Appendix A). This test compares two hypotheses for effect size, whereby, the Null states that the effect size is absent, while the Alternate allocates the effect size (δ) a Cauchy distribution prior (i.e. a non-informative prior), with centre = 0, with assigned interquartile range (r) (i.e. $\delta \sim \text{Cauchy}^+(0, r)$) (Halter, 2018; Wagenmakers et al., 2018). In this analysis, the Alternative hypothesis posits that witness confidence will be higher in the single-blinded condition (Group 1, or SBG_1) compared to the double-blinded (Group 2, or DBG_2);

whereas, the Null posits that there is no difference between SBG₁ and DBG₂. As the consequence of deviating from the JASP default range was unknown, prior distribution was set at $r = 0.707$ (i.e. $\delta \sim \text{Cauchy}^+(0, 0.707)$), following the reasoning presented by Wagenmakers et al. (2018).

3.4.2 Evaluation of Test

General group descriptive statistics were calculated and are presented in Table 7. The resulting Bayes Factor calculated from the t-test for difference in confidence between blinding conditions ($\text{BF}_{-0} = 0.206$) indicates weak evidence for the Alternate hypothesis compared to the Null, the results are outlined in Table 6. This suggests that there is no difference in confidence levels between the single- and double-blinded conditions. Inferential plotting of the prior and posterior distributions in Figure 6 provide a visual representation of how the posterior prior changes with respect to the prior considering the current evidence. The Bayes Factor for the Alternate hypothesis compared to the Null ($\text{BF}_{-0} = 0.206$) and the Null hypothesis compared to the Alternate ($\text{BF}_{0-} = 4.861$) is also presented in Figure 6, along with revised median effect size (median = 0.136) based on the distribution of effect sizes. A small median effect size and weak evidence for the Alternate hypothesis compared to the Null lends no support for Hypothesis 2.

Table 6. *Bayesian Independent Samples T-Test: Difference in Confidence Analysis*

	BF₋₀	error %
Confidence	0.206	~ 0.002

Note. For all tests, the alternative hypothesis specifies that group 1 is less than group 2.

Group 1 = Double-Blinded Conditions

Group 2 = Single-Blinded Conditions

Table 7. Group Descriptive Statistics

	Group	N	Mean	SD	SE	95% Credible Interval	
						Lower	Upper
Confidence	1	25	64.40	19.60	3.919	56.31	72.49
	2	24	61.67	18.10	3.694	54.02	69.31

Group 1 = Double-Blinded Conditions

Group 2 = Single-Blinded Conditions

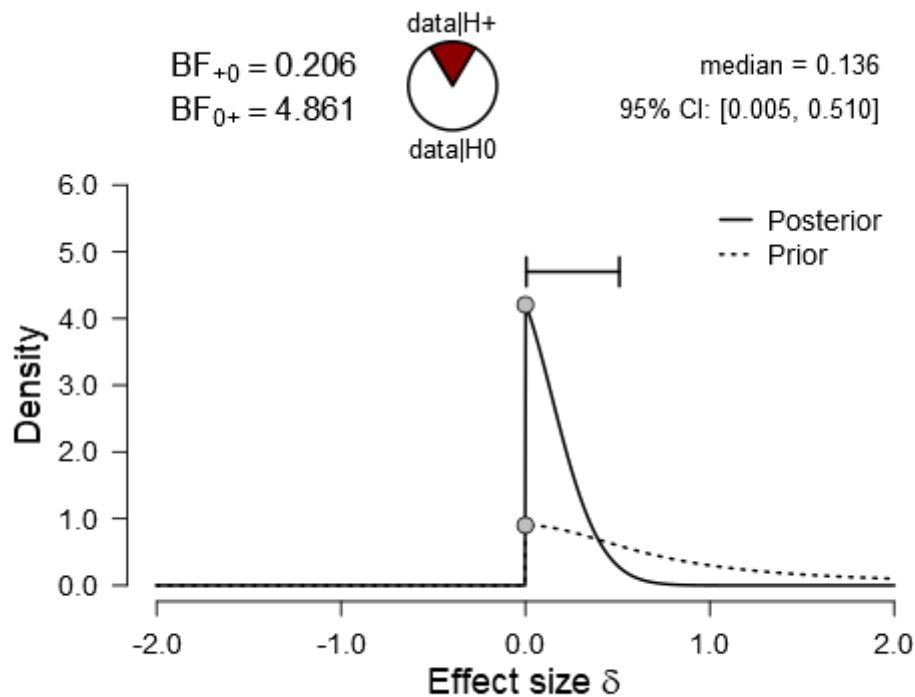


Figure 6: Posterior and Prior effect size distribution plotting. Bayes Factor and the updated median for the effect size range with corresponding 95% CI is also indicated.

3.5.0 Test of Hypothesis 3

3.5.1 Bayesian Pearson Correlation Test

A series of Bayesian Pearson correlation tests were conducted to test Hypothesis 3. The Bayesian alternative to the Pearson correlation test involves the modelling of six parameters: (i) the two marginal distribution means, (ii) the standard deviations, (iii) the degrees-of-freedom which influences the tail heaviness, (iv) and the correlation (ρ). Two tests were conducted on the relationship between witness confidence and administrator pressure within both single- and double-conditions. A (non-informative) uniform prior for ρ was utilised (Barnard, McCulloch, & Meng, 2000). The hypothesis for the double-blind analysis assumes a correlation, however no direction is specified. Whereas, the hypothesis for the single-blind condition assumes a correlation with a negative direction.

3.5.2 Evaluation of Test

The Bayes Factor ($BF_{10} = 0.271$) indicates weak evidence for the Alternate hypothesis compared to the Null, indicating a very weak to non-existent relationship between administrator pressuring behaviours and witness confidence in double-blind conditions ($r = 0.091$).

This is especially indicative in the correlation plot in Figure 7, suggesting that no correlation between administrator pressuring behaviours and witness confidence exists within the double-blinded condition. Plotted prior, and the subsequent posterior, distributions of population correlations in Figure 8 further supports this conclusion, through the Bayes Factor comparing the Null hypothesis to the Alternate ($BF_{01} = 3.686$) and the revised median population correlation (median $\rho = 0.082$).

Table 8. *Bayesian Pearson Correlation: Double-Blind Condition*

				95% Credible interval		
		r	BF₁₀	Lower	Upper	
Confidence	-	Pressure	0.091	0.271	-0.298	0.446

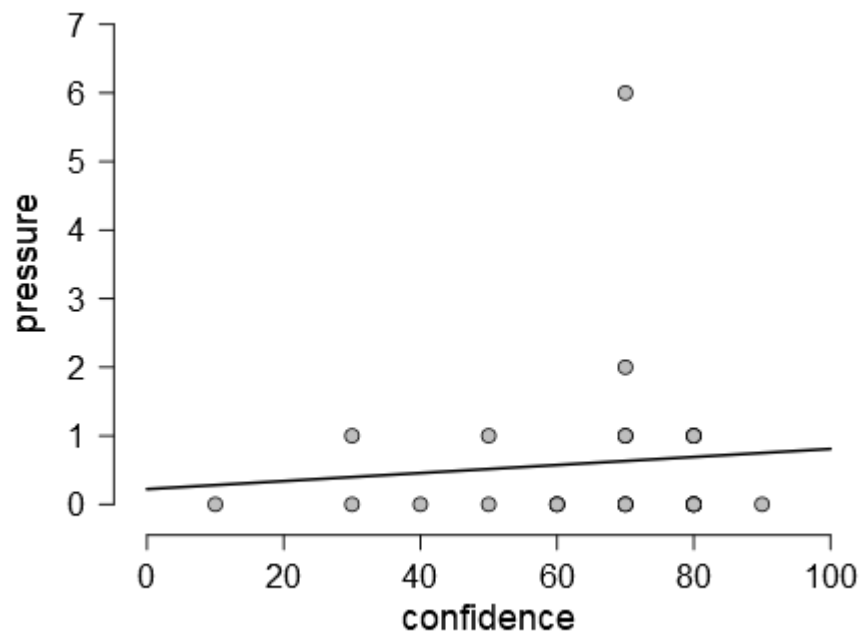


Figure 7: Witness Confidence – Administrator Pressuring Behaviours
 scatterplot for Single-Blind Condition.

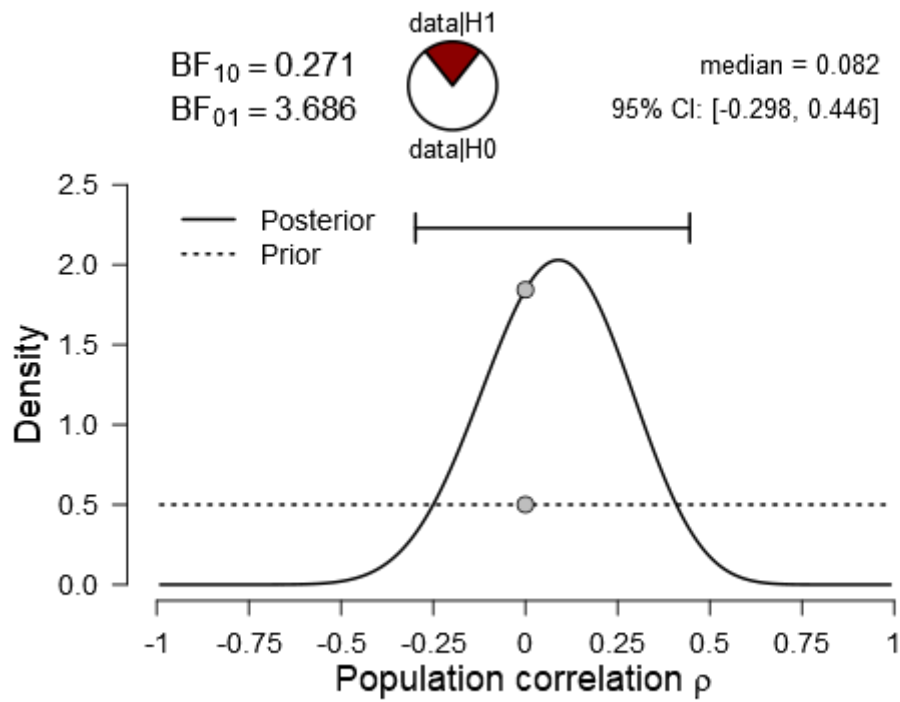


Figure 8. Posterior and Prior Witness Confidence - Administrator Pressuring Behaviours population correlation distribution plotting of Double-blind condition. Bayes Factor and the updated median for the effect size range with corresponding 95% CI is also indicated

The relationship between administrator pressuring behaviours and witness confidence in single-blind conditions ($r = -0.414$) indicates moderate negative correlation. This is particularly evident in the 95% CI presented in Table 9, as it does not contain zero. Figure 9 illustrates the relationship through a scatterplot. The subsequent Bayes Factor ($BF_{-0} = 3.313$) indicates evidence for the Alternate hypothesis compared to the Null. Plotted prior, and the subsequent posterior, distributions of population correlations in Figure 10 further supports this conclusion, through the Bayes Factor comparing the Null hypothesis to the Alternate ($BF_{01} = 0.302$), and the revised median population correlation (median $\rho = -0.379$).

Within Figure 7, of the confidence-pressure relationship in the double-blind condition, an outlier is present, therefore potentially impacting the output of the Bayesian correlational analysis. Removal of the outlier was not performed as it had a negligible effect on the statistical analysis output. Overall, however, the correlational analysis has indicated that there is more evidence for the Alternate hypothesis than there is for the Null for the single-blind condition. This provides support for Hypothesis 3.

Table 9. *Bayesian Pearson Correlation: Single-Blind Condition*

				95% Credible interval		
		r	BF₋₀	Lower	Upper	
Confidence	-	Pressure	-0.414	3.313	-0.677	-0.062

Note. For all tests, the alternative hypothesis specifies that the correlation is negative.

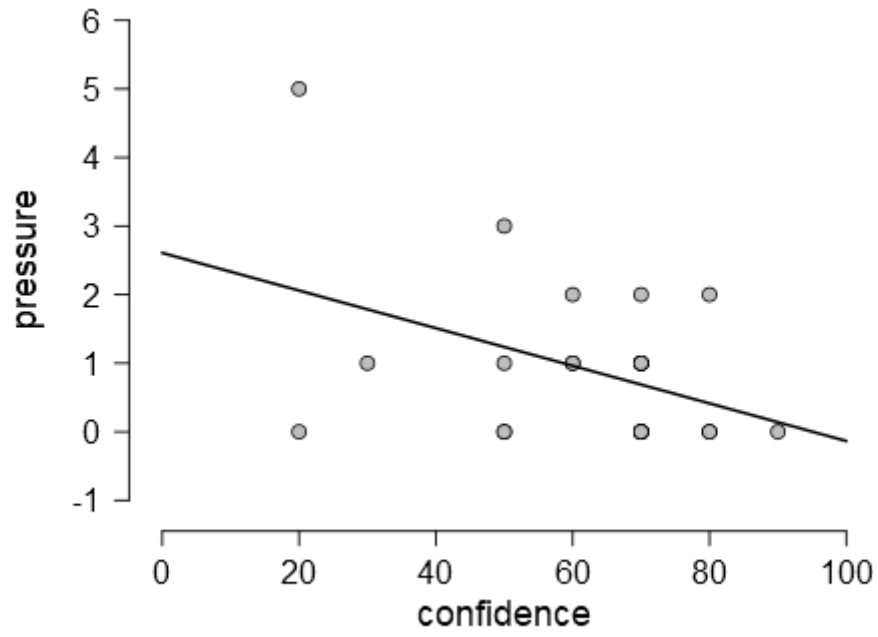


Figure 9: Witness Confidence – Administrator Pressuring Behaviours
scatterplot for Single-Blind Condition.

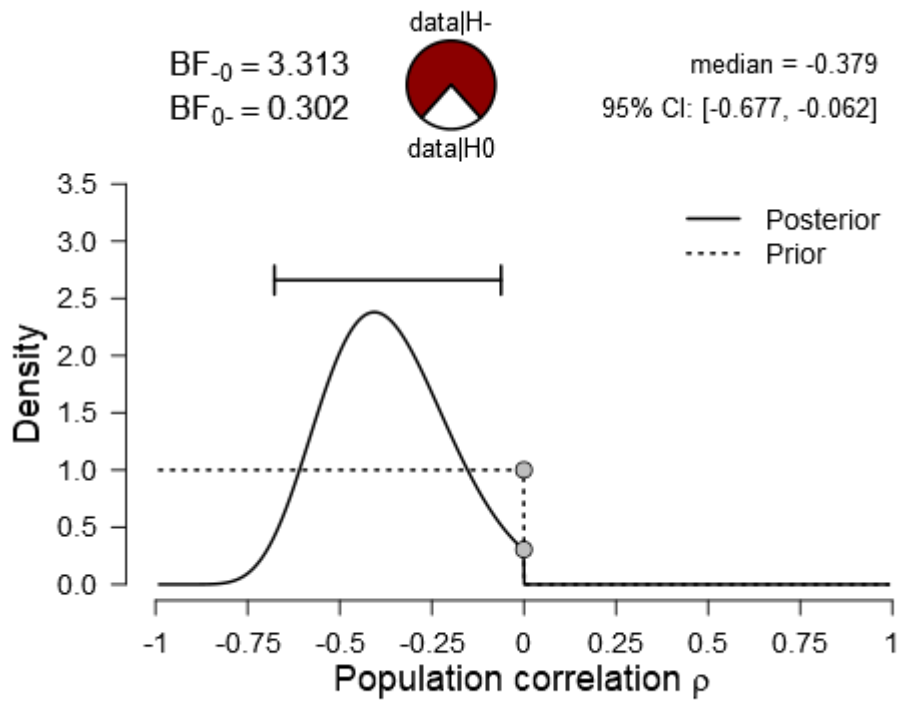


Figure 10. Posterior and Prior population Witness Confidence - Administrator Pressuring Behaviours population-correlation distribution plotting of the Single-blind condition Witness Confidence. Bayes Factor and the updated median for the effect size range with corresponding 95% CI is also indicated.

4.0.0 Discussion

4.1.0 Research Findings

Evaluation of whether there will be a greater than chance rate of choosing from the line-up, in the non-blinded conditions compared with the blinded conditions, indicated that this was not the case. In fact, no identifiable difference in suspect-identification rates existed within both double- and single-blind conditions. This is inconsistent with previous research surrounding the witnesses propensity to make more identifications, and subsequently, more suspect identifications in the presence of a knowledgeable administrator (Clark et al., 2013; Clark et al., 2009; Greathouse & Kovera, 2009).

Presently, there are multiple explanations for this. Foremost, the underpowered nature of the study (due to lack of participants) explicates the difficulty in determining a variation in the proportion of suspect-identifications. Additionally, the fact that the manipulation failed to increase the level of biasing-behaviours expressed by the administrator further explains these results, as indicated within the manipulation-check. However, it should be noted that past research had more compelling material to elicit administrator biasing behaviours. Greathouse and Kovera (2009) presented heavily biasing line-up instructions, whereby the administrator indicated to the witness that the perpetrator was in fact in the line-up. Compared to the present study, which omitted warning the witness of target absence/presence, the more heavily biased instructions within the Greathouse and Kovera study produced conditions which could more potently compel the witness to make an identification.

The sampling and subsequent allocation of participants may also have caused the discrepancy between current and previous results. The study by Clark et al. (2009) allocated participants to the influence condition based upon memory-accuracy strength. That is, individuals who took longer to decide received influencing statements. Contrastingly, the current study randomly allocated participants to conditions and participant roles. This

difference in allocation methodology is critical to clarifying the inconsistency in results, as reduced-memory accuracy has been shown to increase the participant's sensitivity to administrator expectancy effects (Vela & Smith, 1999). The resulting effect may have increased the witness's propensity to make suspect-identification decisions when in the presence of an administrator exhibiting biasing behaviours (Rosenthal, 1994).

Finally, Clark et al. (2013) employs a different methodology regarding administrator training. The current study used the paradigm developed by Phillips et al. (1999), whereby the participants act as either the witness or the administrator in a simulated eyewitness scenario. Comparatively, Clark et al. (2013) employed six research assistants to act as administrators. This is substantial, as administrators have the opportunity to develop and refine biasing behaviours that are more effective in aligning the witnesses' decision with their expectations; administrators in the present study were unable to achieve this. While this reasoning potentially explicates the inconsistency in results, it does bring into question the representativeness of the present study. Unlike the simulated eyewitness paradigm employed within this study, real-world investigators have considerable time to develop the aforementioned biasing behaviours that most effectively produce an identification; this will be later discussed as a potential limitation.

A perplexing inconsistency exists, however, as Zimmerman et al. (2017) produced significant results surrounding administrator knowledge effects on innocent-suspect identifications within a simultaneous line-up format, whereas administrator knowledge effects were constrained in a sequential line-up format. According to previous studies, sequential line-ups facilitate a decreased suspect-identification propensity compared to simultaneous line-ups, resulting in lowered suspect-identifications (Ebbesen & Flowe, 2002; Meissner, Tredoux, Parker, & McLin, 2005). Thus, this illustrates that the lack of a difference between

administrator blinding conditions may be due to either the lack of power within the study or participant-variability, rather than due to an underlying effect within the experiment design.

Analysis of the second hypothesis conveyed no difference in low-accuracy witness confidence assessment between the single- and double-blinded administrator conditions. This suggests that the confidence of low-memory accuracy witnesses is unaffected by feedback cues exhibited by an administrator. This finding moderately coincides with the marginal difference in confidence between blinding conditions observed by Greathouse and Kovera (2009) and Phillips et al. (1999). However, the results are in stark contrast to studies examining witness confidence, and the impact of administrator expectancy effects on it (Clark et al., 2013; Garrioch & Brimacombe, 2001; Wells & Bradfield, 1998). Furthermore, this is also inconsistent with the predictions of the cue integration framework (Charman et al., 2010; Leippe et al., 2009).

This inconsistency can be attributed to the lack of difference in the quantity of biasing behaviours between the blinding conditions, as indicated by the manipulation check. This suggests that the experimental manipulation had little effect on the quantity of biasing cues the administrator communicated to the witness. However, this also suggests that blinding of the administrator had a negligible effect on the amount of pressure they apply to the witness (as is presented in Table 2). If this is the case, while simply blinding the administrator during real-world line-up procedures may prevent 'steering' behaviours, it may not prevent the administrator's propensity to 'push' the witness towards an identification.

Finally, it was hypothesised that as a witness is exposed to administrator pressuring behaviours to make an identification, within a non-blinded condition, the less post-identification confidence they will report. Evaluation of the data has produced support for this hypothesis. As this hypothesis was exploratory in nature, few studies have examined the effect of pre-identification pressuring behaviours on post-identification confidence. However, the

results of the present study align with research surrounding peer pressure and the resulting deleterious effects on individuals' confidence in general and academic capabilities (Kiran-Esen, 2012). That is, the data suggests that as an administrator applies pressure to a witness to make an identification, the witness will develop reduced confidence in their decision. The data also suggests that this can occur whether a rejection or an identification is made. If the witness was intending on rejecting the line-up, cues from the administrator indicating that the perpetrator is in fact present within the line-up, and that the witness must choose from the line-up, will inevitably reduce the witness's confidence in their rejection or identification.

The data within the present study is, however, inconsistent with literature observing the effects of pre-admonition suggestion on eyewitness confidence; as participant-witnesses within a pre-admonitive condition report an increased post-identification confidence assessment (Eisen et al., 2017; Quinlivan et al., 2016). A potential reason that explains this variance lies in a fundamental difference between the pressuring behaviours and the pre-admonition suggestions. Pre-admonition involves the administrator communicating a scripted 'suggestion' (e.g. "...surely you are going to be able to pick the person out of the line-up...") (Quinlivan et al., 2016, p. 239) to the witness prior to viewing the line-up. Contrastingly, pressuring behaviours within the current study occur after the witness views the line-up (e.g. administrator questions the witness's rejection). Unlike pre-admonitions, pressuring behaviours do not prime the witness to make an identification by cuing them into the nature of the line-up, prior to viewing it. Rather, the witnesses would have begun forming their decision before receiving the pressure, subsequently impacting the witness's confidence in the decision. Contrastingly, the responses primed from the pre-admonition would reinforce the witness's confidence in the response; any subsequent biasing behaviours from the administrator would also strengthen the witness's decision-confidence.

4.2.0 Strengths and Limitations of Research

While the purpose of the reward was to incentivise elicitation of suspect identifications from the witnesses, actual police officers do not receive such an immediate reward. Furthermore, investigators are not directly informed of potential rewards for ascertaining a suspect identification. Moreover, while this study's sample is highly heterogeneous, participants do not have the experience and training associated with investigative line-up administration within the police force. A typical investigator may have developed biases throughout their career, which are not present within the community sample of the current study. Also, while investigators do not receive immediate compensation, the incentive for eliciting a suspect identification is exceedingly more compelling; as investigators are responsible for the apprehension of criminals. It should also be noted that, even if a larger, more representative sample, was collected, caution must be practiced when generalizing to police behaviour. Extensive literature exists surrounding the recommended procedures, and subsequent behaviour of investigators; however, literature observing the actual behaviour of investigators is limited. Therefore, results pertaining to the data within the current study, and similar studies, cannot accurately portray the actual behaviour of investigators. By extension, the actual conditions, which may influence the witness decision-making, are unknown. Thus, the present study may have underestimated the presence of biasing behaviours originating from the administrator.

Despite this, unlike many previous studies examining the various facets of line-up administration, this study did not rely on a younger undergraduate sample (e.g. Greathouse and Kovera (2009), Phillips et al. (1999), and Haw and Fisher (2004)). This improves the overall representativeness as investigators are not entirely comprised of a younger demographic. Additionally, increased variability on account of high sample heterogeneity further improves study representativeness, as differences in administration approach better mimics the variation

in real-world scenarios. Thus, while we cannot be certain of accurate portrayal of investigator behaviours, it can be argued that the present study better represents the variability in how investigators conduct line-up procedures, compared to previous research.

Another potential issue within the study, especially from the perspective of the wider academic community, is the use of a Bayesian framework to analyse the data. For reference, a frequentist-based analysis was conducted and is presented in Appendix D. A binomial test, independent t-test, and Pearson's-r correlational analysis was performed, and the results of these analyses were similar to the primary Bayesian analysis presented previously. However, due to the high chance of lack of normality and unequal variance within the data, numerous assumptions would not be maintained if a frequentist approach was used. Whereas, use of a Bayesian framework possesses multiple advantages including the ability to combine prior information with the data to produce inferences, such inferences are not reliant on asymptotic approximation, and the framework proceeds with small sample inferences in the same manner as large samples. Overall, the use of a Bayesian framework is preferable over that of a frequentist methodology.

The research materials derived from the Zimmerman et al. (2017) study may have artificially induced the pressuring behaviours present within this study. The decision to utilize the New York State District Attorney's Association Best Practices Committee (2011) instructions, while omitting the warning about perpetrator presence, was made to increase the effects of administrator knowledge, as the instructions create conditions which increase the propensity for witness identification decisions (Greathouse & Kovera, 2009). Conversely, if different instructions were used, far fewer identifications would have been recorded, producing a substantially smaller administrator knowledge effect. Thus, if unbiased instructions were used, even though previous research has determined administrator knowledge effects under unbiased

conditions, a much larger sample size would have been required to observe an effect in the present study (Charman & Quiroz, 2016).

A brief note should be made about potential factors observed that may have affected the outcome of the line-up procedures. During the training of administrators, the researcher noted that numerous participants would comment on the lack of integrity in the officer within the training-video; stating that the officer was “pushy” and “obviously trying to get an ID”. Comments on the true nature of the experiment were also observed. This may have resulted in these administrators making a conscious effort to maintain neutrality. While biasing behaviours can be unconscious, conscious effort to limit them would irrevocably reduce the amounts exhibited (Kovera & Evelo, 2017). The researcher also noted that a portion of administrators seemed anxious when conducting the line-up procedure; that is, administrators were recorded fidgeting, or repeatedly looking at the camera. This may have resulted in one of multiple outcomes. The anxiety present within the administrator may have masked the biasing behaviours, or the anxiety may have been misinterpreted as impatience by the witness, therein facilitating a similar effect as administrator-expressed pressuring behaviours.

This further brings into question the overt nature of the camera; as recording of the line-up procedure within previous research was conducted surreptitiously (Greathouse & Kovera, 2009; Zimmerman et al., 2017). Ethical obligations disallowed covert recording of participants within the current study, and this may have compelled administrators to maintain their neutrality throughout the course of the experiment. The argument can be made, however, that the presence of an overt camera better represents the conditions of a real-world line-up procedure. It is protocol for legal line-up procedures to be audio-visually recorded; and the acting investigator is fully aware of this (Australian Federal Police, 2013). This presents an issue for past research employing the surreptitious-recording paradigm, as the lack of surveillance reduces the participant-administrator’s accountability for maintaining integrity

throughout the procedure. However, the increase in administrator biasing behaviors may result in an improved ability to observe the impact of such behaviours. Nonetheless, the presence of an overt camera within the present study creates conditions that are representative of real-world scenarios. Thus, this reinforces the idea that the current study is more ecological compared to previous research.

4.3.0 Future Research Directions and Practical Implications

Within the current study, the incidence of pre-identification biasing behaviours (and by extension, pressuring behaviours) occurs at a substantially higher rate compared to the incidence of post-identification behaviours. This was illustrated during development of the administrator biasing behaviour coding scheme, and subsequent coding of behaviours, wherein thirty pre-identification behaviours were observed, compared to only eighteen post-identification behaviours. This is significant, as current literature focuses heavily on administrator expression of post-identification feedback (i.e. through confirmatory or disconfirmatory feedback cues), and the potential effects this may have on the witness's confidence. The present study has indicated to the contrary, however, that this may have been due to the relatively limited opportunities available for administrators to provide post-identification feedback. Nevertheless, it suggests that expectancy cues communicated to the witness during the decision-making process are more prominent. Implications for this are twofold, whereby, in future research, experimental manipulations should aim to elicit more post-identification behaviours from the administrators, allowing the observation of its effects. Secondly, during scrutiny of line-up procedures within real-world situations, more focus should be placed on its administration, to prevent pre-identification biasing cues.

Additionally, analysis of Hypothesis 2, supplemented by the manipulation check, demonstrated the potentiality of administrator blinding having little effect on the amount of pressuring behaviours exhibited. While a demonstrably weaker relationship between witness

confidence and pressuring behaviours was determined in the blinded condition, such behaviour was still present. This highlights the need to direct further research at the effects of pressure behaviours on eyewitness decision-making. Furthermore, it also illustrates the importance of ensuring that administration of line-up procedures is meticulously scrutinised throughout the witness decision-making stages, as well as after the witness decision. Observations from the present study suggest that pressuring behaviours also influence witness confidence. This suggests that confidence may be a good indicator of administrator bias within the line-up procedure. Thus, during criminal proceedings, a reported low-confidence by the eyewitness may warrant further scrutiny regarding the collection of eyewitness evidence.

Finally, another point of interest that can be applied to future research is the methodology used to elicit biasing behaviours within administrators. Due to the difficulty in the recruitment of participants for research comparable to the present study, increasing the propensity for biasing cues will allow an effect, if any, to be more easily delineable. The lack of difference in biasing cues between blinding conditions in the present study illustrates this difficulty. Therefore, future studies, using the simulated eyewitness paradigm developed by Phillips et al. (1999), should look to employ a training scheme that improves the participant-administrators' ability to conduct the line-up procedure, while eliciting increased levels of biasing behaviours. While this may not be considered representative of a real-world scenario, the increased presence of organically produced biasing-behaviours will provide an improved insight into their effects on witness decision-making and confidence assessment.

4.4.0 Conclusions

The results of this study presented trivial support for the prediction that an eyewitness's propensity to make a suspect-identification will increase in the presence of a knowledgeable administrator. Additionally, negligible support was conveyed for the prediction that a low memory-accuracy eyewitness's confidence will increase in the presence of a non-blinded

administrator. However, the study does suggest that when an administrator expresses pressure-biasing behaviours to an eyewitness during a simultaneous line-up procedure, the eyewitness's resulting confidence in their decision, whether it is a rejection or identification, will be lowered. Specifically, this relationship is strongest when the administrator is aware of the suspect's location, reinforcing the recommendation of the use of a double-blinded format during investigative line-up procedures.

References

- Australian Federal Police. (2013). AFP Practical Guide on identification evidence (ACT Policing) ACT: Chief Police Officer ACT Policing. Retrieved from <https://www.afp.gov.au/sites/default/files/PDF/IPS/AG00041%20PG%20on%20Identification%20evidence%20ACT%20Policing.pdf>.
- Barnard, J., McCulloch, R., & Meng, X. (2000). Modeling Covariance Matrices in Terms of Standard Deviations and Correlations, with application to shrinkage. *Statistica Sinica*, 10, 1281-1311.
- Charman, S. D., Carlucci, M., Vallano, J., & Gregory, A. H. (2010). The selective cue integration framework: a theory of postidentification witness confidence assessment. *J Exp Psychol Appl*, 16(2), 204-218. doi: 10.1037/a0019495
- Charman, S. D., & Quiroz, V. (2016). Blind sequential lineup administration reduces both false identifications and confidence in those false identifications. *Law Hum Behav*, 40(5), 477-487. doi: 10.1037/lhb0000197
- Clark, S. E. (2012). Costs and Benefits of Eyewitness Identification Reform: Psychological Science and Public Policy. *Perspect Psychol Sci*, 7(3), 238-259. doi: 10.1177/1745691612439584
- Clark, S. E., Brower, G. L., Rosenthal, R., Hicks, J. M., & Moreland, M. B. (2013). Lineup administrator influences on eyewitness identification and eyewitness confidence. *Journal of Applied Research in Memory and Cognition*, 2(3), 158-165. doi: 10.1016/j.jarmac.2013.06.003
- Clark, S. E., Marshall, T. E., & Rosenthal, R. (2009). Lineup administrator influences on eyewitness identification decisions. *J Exp Psychol Appl*, 15(1), 63-75. doi: 10.1037/a0015185

- Connors, E., Lundregan, T., Miller, N., & McEwen, T. (2015). Convicted by juries, exonerated by science: Case studies in the use of DNA evidence to establish innocence after trial In D. Shaw (Ed.), *Exonerated by DNA : Issues and Case Profiles in the Use of Exculpatory DNA Evidence* (pp. 1 - 92). Alexandria, CA. : Nova Science Publishers, Inc.
- Dioso-Villa, R. (2015). A Repository of Wrongful Convictions in Australia: First Steps Toward Estimating Prevalence and Causal Contributing Factors. *Flinders Law Journal*, 17(1), 163-202.
- Ebbesen, E. B., & Flowe, H. D. (2002). Simultaneous v. Sequential Lineups: What do we really know? Loughborough University Institutional Repository. Retrieved from <https://dspace.lboro.ac.uk/2134/20167>
- Eisen, M. L., Skerrett-Perta, A., Jones, J. M., Owen, J., & Cedré, G. C. (2017). Pre-admonition Suggestion in Live Showups: When Witnesses Learn that the Cops Caught 'the' Guy. *Applied Cognitive Psychology*, 31(5), 520-529. doi: 10.1002/acp.3349
- Garrioch, L., & Brimacombe, C. A. E. (2001). Lineup Administrators' Expectations Their Impact on Eyewitness Confidence. *Law and Human Behaviour*, 25(299-315). doi: <http://dx.doi.org/10.1023/A:1010750028643>
- Greathouse, S. M., & Kovera, M. B. (2009). Instruction bias and lineup presentation moderate the effects of administrator knowledge on eyewitness identification. *Law Hum Behav*, 33(1), 70-82. doi: 10.1007/s10979-008-9136-x
- Halter, C. (2018). *Exploring Statistical Analysis Using Jasp: Frequentist and Bayesian Approaches*: CreateSpace Independent Publishing Platform.
- Halverson, A., Hallahan, M., Hart, A. J., & Rosenthal, R. (1997). Reducing the Biasing Effects of Judges' Nonverbal Behavior With Simplified Jury Instruction. *Journal of Applied Psychology*, 82(4), 590-598.

- Haw, R. M. (2005). A theoretical analysis of eyewitness identification: Dual -process theory, signal detection theory and eyewitness confidence. Doctor of Philosophy (Dissertation), Florida International University Miami, Florida. (3169457)
- Haw, R. M., & Fisher, R. P. (2004). Effects of administrator-witness contact on eyewitness identification accuracy. *J Appl Psychol*, 89(6), 1106-1112. doi: 10.1037/0021-9010.89.6.1106
- JASP Team. (2018). JASP 0.9.1.0. Amsterdam, The Netherlands: University of Amsterdam.
- Kassin, S. M., Goldstein, C. C., & Savitsky, K. (2003). Behavioral Confirmation in the Interrogation Room On the Dangers of Presuming Guilt. *Law and Human Behaviour*, 27(2), 187-203. doi: <https://doi-org.proxy.library.adelaide.edu.au/10.1023/A:1022599230598>
- Kiran-Esen, B. (2012). Analyzing Peer Pressure and Self-Efficacy Expectations Among Adolescents. *Social Behavior and Personality: an international journal*, 40(8), 1301-1309. doi: 10.2224/sbp.2012.40.8.1301
- Kovera, M. B., & Evelo, A. J. (2017). The case for double-blind lineup administration. *Psychology, Public Policy, and Law*, 23(4), 421-437. doi: 10.1037/law0000139
- Kruschke, J. K. (2012). Bayesian estimation supersedes the t-test. *Journal of Experimental Psychology: General*, 142(2), 573-603. doi: doi: 10.1037/a0029146
- Lee, M. D. (2004). Models, Parameters and Priors in Bayesian Inference. Department of Psychology. University of Adelaide. South Australia, 5005, AUSTRALIA.
- Leippe, M. R., Eisenstadt, D., & Rauch, S. M. (2009). Cueing confidence in eyewitness identifications: influence of biased lineup instructions and pre-identification memory feedback under varying lineup conditions. *Law Hum Behav*, 33(3), 194-212. doi: 10.1007/s10979-008-9135-y

- Lindsay, R. C. L., & Wells, G. L. (1985). Improving Eyewitness Identifications From Lineups: Simultaneous Versus Sequential Lineup Presentation. *Journal of Applied Psychology, 70*(3), 556-564.
- Luus, C. A. E., & Wells, G. L. (1994). The Malleability of Eyewitness Confidence: Co-Witness and Persistence Effects. *Journal of Applied Psychology, 79*(5), 714-723.
- McQuiston-Surrett, D., Malpass, R. S., & Tredoux, C. G. (2006). Sequential vs. Simultaneous Lineups: A Review of Methods, Data, and Theory. *Psychology, Public Policy, and Law, 12*(2), 137-169. doi: 10.1037/1076-8971.12.2.137
- Meissner, C. A., Tredoux, C. G., Parker, J. F., & McLin, O. H. (2005). Eyewitness decisions in simultaneous and sequential lineups: A dualprocess signal detection theory analysis. *Memory & Cognition, 33*(5), 783-792.
- New York State District Attorney's Association Best Practices Committee. (2011). Photo Array Form. Retrieved from http://www.criminaljustice.ny.gov/ops/training/other/story_content/external_files/photoarrayform.pdf.
- Olsson, N. (2000). A comparison of correlation, calibration, and diagnosticity as measures of the confidence-accuracy relationship in witness identification. *Journal of Applied Psychology, 83*(4), 501-511. doi: 10.1037/0021-9010.83.4.501
- Penrod, S., & Cutler, B. L. (1995). Witness Confidence and Witness Accuracy: Assessing Their Forensic Relation. *Psychology, Public Policy, and Law, 1*(4), 817-845. doi: 10.1037/1076-8971.1.4.817
- Perlini, A. H., & Silvaggio, A. D. (2007). Eyewitness Misidentification Single vs Double-Blind Comparison of Photospread Administration. *Psychological Reports, 100*, 247-256. doi: <http://dx.doi.org/10.2466/pr0.100.1.247-256>

- Phillips, M. R., McAuliff, B. D., Kovera, M. B., & Cutler, B. L. (1999). Double-Blind Photoarray Administration as a Safeguard against instigator bias. *Journal of Applied Psychology, 84*, 940-951. doi: <http://dx.doi.org/10.1037/0021-9010.84.6.940>
- Quinlivan, D. S., Wells, G. L., Neuschatz, J. S., Luecht, K. M., Cash, D. K., & Key, K. N. (2016). The Effects of Pre-admonition Suggestions on Eyewitnesses' Choosing Rates and Retrospective Identification Judgments. *Journal of Police and Criminal Psychology, 32*(3), 236-246. doi: 10.1007/s11896-016-9216-7
- Raftery, A. E. (1995). Bayesian model selection in social research. *Sociological Methodology, 25*, 111-163. doi: 10.2307/271063
- Rhead, L. M., Rodriguez, D. N., Korobeynikov, V., Yip, J. H., & Bull Kovera, M. (2015). The Effects of Lineup Administrator Influence and Mortality Salience on Witness Identification Accuracy. *Journal of Forensic Psychology Practice, 15*(3), 248-274. doi: 10.1080/15228932.2015.1041362
- Rodriguez, D. N., & Berry, M. A. (2013). Eyewitness Science and the Call for Double-Blind Lineup Administration. *Journal of Criminology, 2013*, 1-10. doi: 10.1155/2013/530523
- Rosenthal, J. B. (1994). Interpersonal Expectancy Effects: A 30-year Perspective. *Current Directions in Psychological Science, 3*(6), 176-179. doi: 10.1111/1467-8721.ep10770698
- Rosenthal, J. B., & Fode, K. L. (1963). Psychology of the scientist: V. Three experiments in experimenter bias. *Psychological Reports, 12*, 491-511. doi: <http://psycnet.apa.org/doi/10.2466/pr0.1963.12.2.491>
- Rosenthal, J. B., & Rubin, D. B. (1978). Interpersonal expectancy effects: the first 345 studies. *Behavioral and Brain Sciences, 1*(03). doi: 10.1017/s0140525x00075506

- Russano, M. B., Dickinson, J. J., Greathouse, S. M., & Kovera, M. B. (2006). "Why Don't you Take Another Look at Number Three?": Investigator Knowledge and its Effects on Eyewitness Confidence and Identification Decisions. *Cardozo, Public Law, Policy, and Ethics Journal*, 4, 355-379.
- Semmler, C., Dunn, J., Mickes, L., & Wixted, J. T. (2018). The Role of Estimator Variables in Eyewitness Identification. *J Exp Psychol Appl*. doi: 10.1037/xap0000157
- Spencer, B. D. (2007). Estimating the Accuracy of Jury Verdicts. *Journal of Empirical Legal Studies*, 4(2), 305-329. doi: <https://doi-org.proxy.library.adelaide.edu.au/10.1111/j.1740-1461.2007.00090.x>
- Stebly, N. K., Dysart, J., Solomon, F., & Lindsay, R. C. L. (2001). Eyewitness Accuracy Rates in Sequential and Simultaneous Lineup Presentations A Meta-Analytic Comparison. *Law and Human Behaviour*, 25(5). doi: <https://doi-org.proxy.library.adelaide.edu.au/10.1023/A:1012888715007>
- Stebly, N. K., Wells, G. L., & Douglass, A. B. (2014). The eyewitness post identification feedback effect 15 years later: Theoretical and policy implications. *Psychology, Public Policy, and Law*, 20(1), 1-18. doi: 10.1037/law0000001
- The Innocence Project. (2017). Innocence Project. Retrieved 2018, from <https://www.innocenceproject.org/>
- Vela, E., & Smith, S. M. (1999). Environmental context-dependent memory: A review and meta-analysis. *Psychonomic Bulletin & Review*, 8(2), 203-220. doi: <https://doi.org/10.3758/BF03196157>
- Wagenmakers, E. J., Love, J., Marsman, M., Jamil, T., Ly, A., Verhagen, J., . . . Morey, R. D. (2018). Bayesian inference for psychology. Part II: Example applications with JASP. *Psychon Bull Rev*, 25(1), 58-76. doi: 10.3758/s13423-017-1323-7

- Wells, G. L. (1988). *Eyewitness identification: A system handbook*. Toronto, Ontario, Canada: Carswell Legal Publications.
- Wells, G. L., & Bradfield, A. L. (1998). "Good you identified the suspect": Feedback to eyewitnesses distorts their reports of the witnessing experience. *Journal of Applied Psychology*, 83(3), 360-376.
- Wells, G. L., Small, M., Penrod, S., Malpass, R. S., Fulero, S. M., & Brimacombe, C. A. E. (1998). Eyewitness Identification Procedures Recommendations for Lineups and Photospreads. *Law and Human Behaviour*, 22(603). doi: <https://doi-org.proxy.library.adelaide.edu.au/10.1023/A:1025750605807>
- Wetzels, R., Matzke, D., Lee, M. D., Rouder, J. N., Iverson, G. J., & Wagenmakers, E. J. (2011). Statistical Evidence in Experimental Psychology: An Empirical Comparison Using 855 t Tests. *Perspect Psychol Sci*, 6(3), 291-298. doi: 10.1177/1745691611406923
- Wixted, J. T., & Mickes, L. (2014). A Signal-Detection-Based Diagnostic-Feature Model of Eyewitness Identification *Psychological Review*, 121(2), 262-276. doi: 10.1037/a0035940
- Wixted, J. T., Mickes, L., Dunn, J. C., Clark, S. E., & Wells, W. (2016). Estimating the reliability of eyewitness identifications from police lineups. *Proc Natl Acad Sci U S A*, 113(2), 304-309. doi: 10.1073/pnas.1516814112
- Zhu, M., & Lu, A. Y. (2017). The Counter-intuitive Non-informative Prior for the Bernoulli Family. *Journal of Statistics Education*, 12(2). doi: 10.1080/10691898.2004.11910734
- Zimmerman, D. M., Chorn, J. A., Rhead, L. M., Evelo, A. J., & Kovera, M. B. (2017). Memory strength and lineup presentation moderate effects of administrator influence on mistaken identifications. *J Exp Psychol Appl*, 23(4), 460-473. doi: 10.1037/xap0000147

Appendix A

ID Number:

Date:

Participant Administrator Questionnaire

Gender: Male Female Other

Age:

Please indicate your agreeance with the following statements regarding the line-up procedure you just participated in.

Question	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1 I pressured the witness to identify someone in this lineup.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 The instructions I provided the witness were unbiased.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 I gave the witness instructions that encouraged the witness to choose someone in particular.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 I was fair and impartial throughout the lineup administration.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 I tried to get the witness to pick a particular person in the lineup.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6 I arranged the lineup in a biased manner (for example, the photos were shown in a biased order or pattern).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7 I believe that my behavior influenced the decision made by the witness in this lineup.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8 All things considered, the lineup administration was fair and unbiased.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 11. Questionnaire with item ratings for measurement of Administrator's perceived self-biasing behaviour expression.

ID Number:

Date:

Participant Witness Questionnaire

Gender: Male Female Other

Age:

Please indicate your agreement with the following statements regarding the line-up procedure you just participated in.

	Question	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1	I felt pressure to identify someone in this lineup.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	The instructions provided to me by the lineup administrator of this lineup were unbiased.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	The lineup administrator knew who the suspect was.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	The lineup administrator was trying to get me to pick a particular person in the lineup.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	The instructions given to me during this lineup were biased in favor of me choosing someone in particular.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	The administrator of this lineup was fair and impartial throughout the lineup administration.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	The suspects were presented in a biased manner (for example, the photos were shown in a biased order or pattern).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	The administrator's behavior while conducting the lineup influenced my identification decision.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	All things considered, the lineup administration was fair and unbiased.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 12. Questionnaire with item ratings for measurement of Witness's perceived administrator biasing behaviours.

ID Number:		Date:								
	Question	Strongly Disagree	Disagree	Disagree	Disagree	Neither Agree nor Disagree	Disagree	Disagree	Disagree	Strongly Agree
1	During the video, I had a good view of the perpetrator.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	During the video, I had a good opportunity to view the perpetrator's face.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	I paid attention to the perpetrator during the videotaped crime.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	I had a good basis to make identification.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	I felt that it was easy to make an identification.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	I identified the perpetrator quickly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	I would be willing to testify about my identification decision at trial.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	I have a good memory for strangers' faces.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	I can clearly see the image of the perpetrator in my mind.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	I would trust an eyewitness who had a similar viewing experience to mine.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11	I would trust an eyewitness who had a similar line-up administrator experience.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12	My identification decision would provide useful information for the police if this were a real-life criminal investigation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 13. Questionnaire with item ratings for measurement of Witness's perceived memory-accuracy strength.

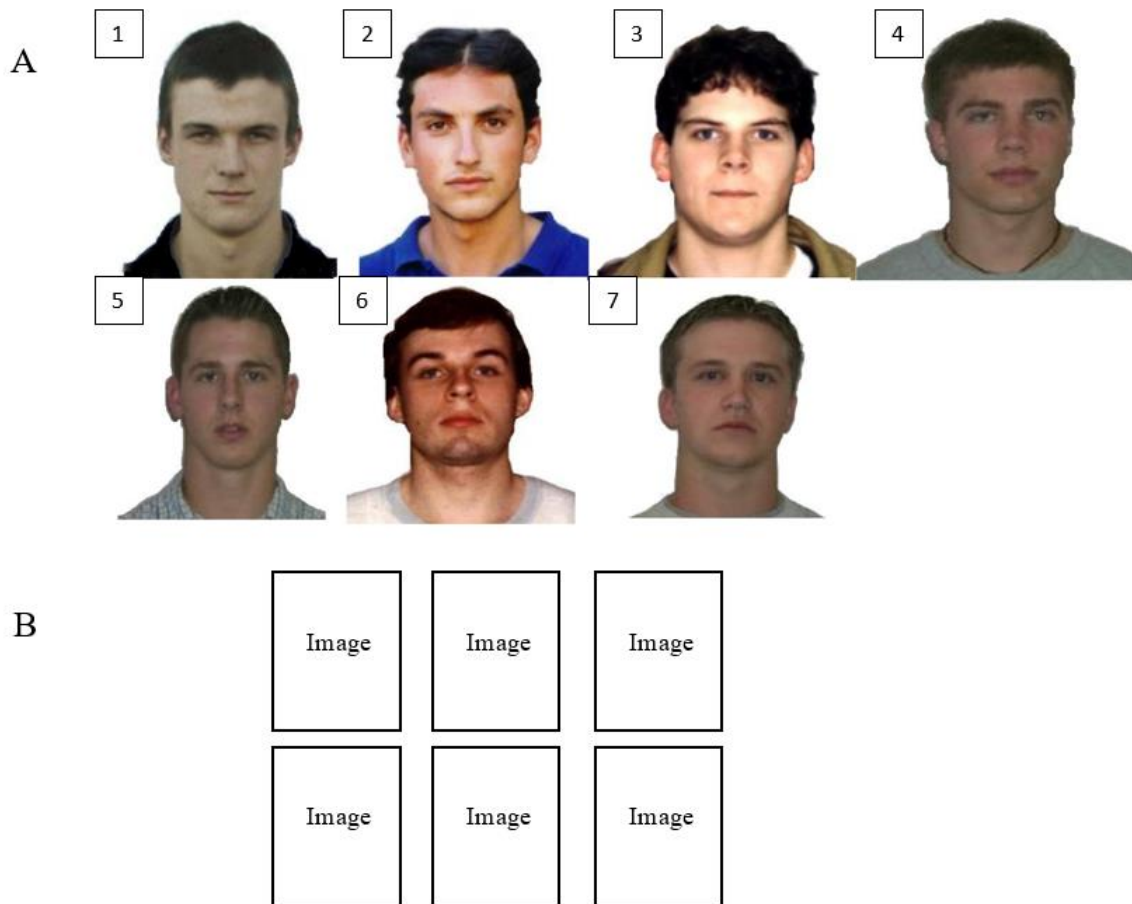
Appendix B

Read the following to the Witness *PRIOR* to showing the Photo Array

-
- As part of the ongoing investigation into a crime we are asking you to view a line-up to see if you recognize anyone involved with that crime
-
- It consists of six photographs of individuals. Each photograph has a number underneath the photograph.
-
- Take whatever time you want to view the photo array.
-
- Do not look to me for guidance during the procedure.
-
- Do not assume that I know who the perpetrator is.
-
- Individuals presented in the photo array may not appear exactly as they did on the date of the incident because features, such as head and facial hair, are subject to change.
-
- Photographs may not always depict the true complexion of a person; it may be lighter or darker than shown in the photo.
-
- Pay no attention to any markings that may appear on the photos, or any other difference in the type or style of the photographs.
-

Figure 14. Extract of the instructions that were provided to the participant administrator to be read to the participant witness, prior to laying out the photo-array.

Appendix C



Appendix D

Hypothesis 1

Table 10. *Binomial Test of Proportion of Responses*

	Response Level	Counts	Total	Proportion	p
Double-Blind	1	7	25	0.280	0.993
	2	18	25	0.720	0.022
Single-Blind	1	10	24	0.417	0.846
	2	14	24	0.583	0.271

Note. For all tests, the alternative hypothesis specifies that the proportion is greater than 0.5.

Response level 1 = Correct or Suspect Identification (Hit)

Response Level 2 = Rejection or Foil Identification (Miss)

Hypothesis 2

Table 11. *Independent Samples T-Test for Difference in Confidence across Blinding*

Conditions

	t	df	p
Confidence	-0.408	29.00	0.657

Note. Student's t-test.

Note. For all tests, the alternative hypothesis specifies that group 0 is greater than group 1.

Hypothesis 3

Table 12. *Pearson Correlations for Confidence – Pressure Relationship*

	Pearson's r	<i>p</i>	Lower 95% CI	Upper 95% CI
Double-Blind	0.091	0.664	-0.315	0.469
Single-Blind	-0.414	0.022	-1.000	-0.081

Appendix E

Table 13. *Proportions of Decision-Making Styles by Condition*

	n	Decision-Style		
		Rejection	Recognition	Process of Elimination
DB-TP	12	0	0.42	0.58
SB-TP	12	0	0.25	0.75
DB-TA	13	0.46	0.46	0.08
SB-TA	12	0.33	0	0.67

DB = Double-Blind, SB = Single -Blind, TP = Target-Present, TA = Target-Absent

Table 14. *Proportions of Responses by Condition*

	Response			
	Correct ID	Miss	Correct Rejection	False Alarm
DB-TP	0.42	0.58	-	-
SB-TP	0.75	0.25	-	-
DB-TA	-	-	0.46	0.54
SB-TA	-	-	0.33	0.67

DB = Double-Blind, SB = Single -Blind, TP = Target-Present, TA = Target-Absent

Appendix F

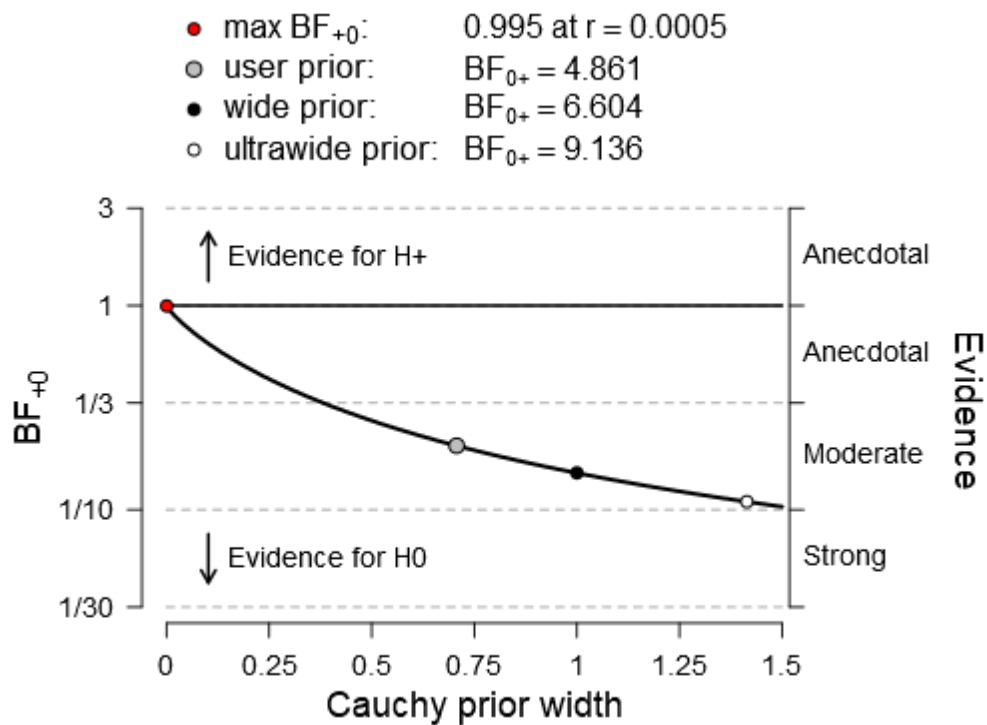


Figure 16. Bayes Robustness check for the Bayesian independent samples T-Test comparing witness-confidence across blinding conditions.

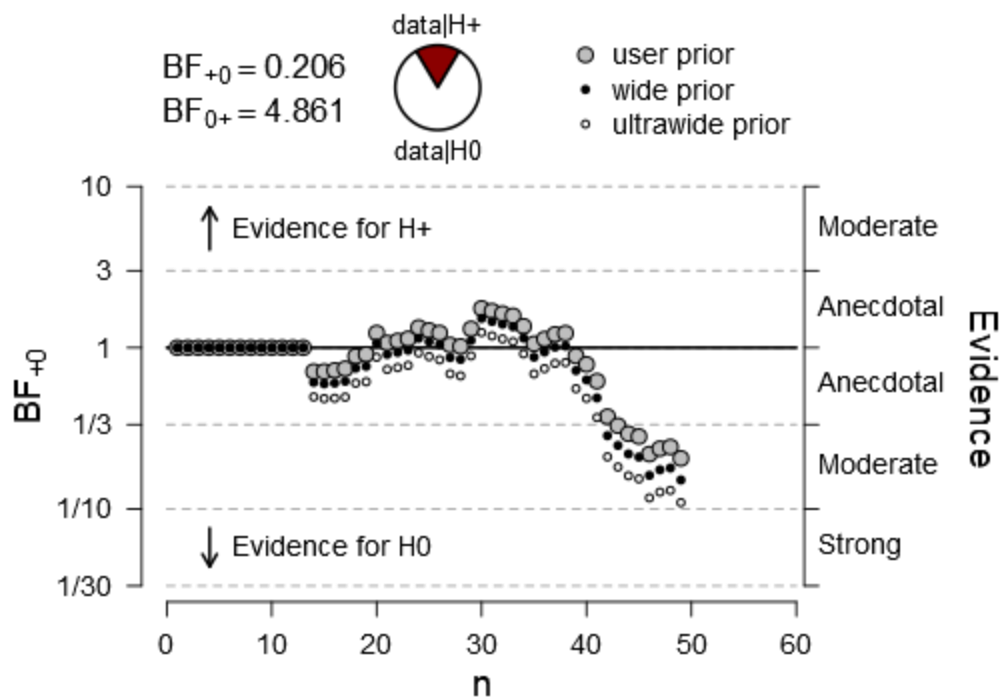


Figure 17. Bayes sequential analysis for the Bayesian independent samples T-Test comparing witness-confidence across blinding conditions.

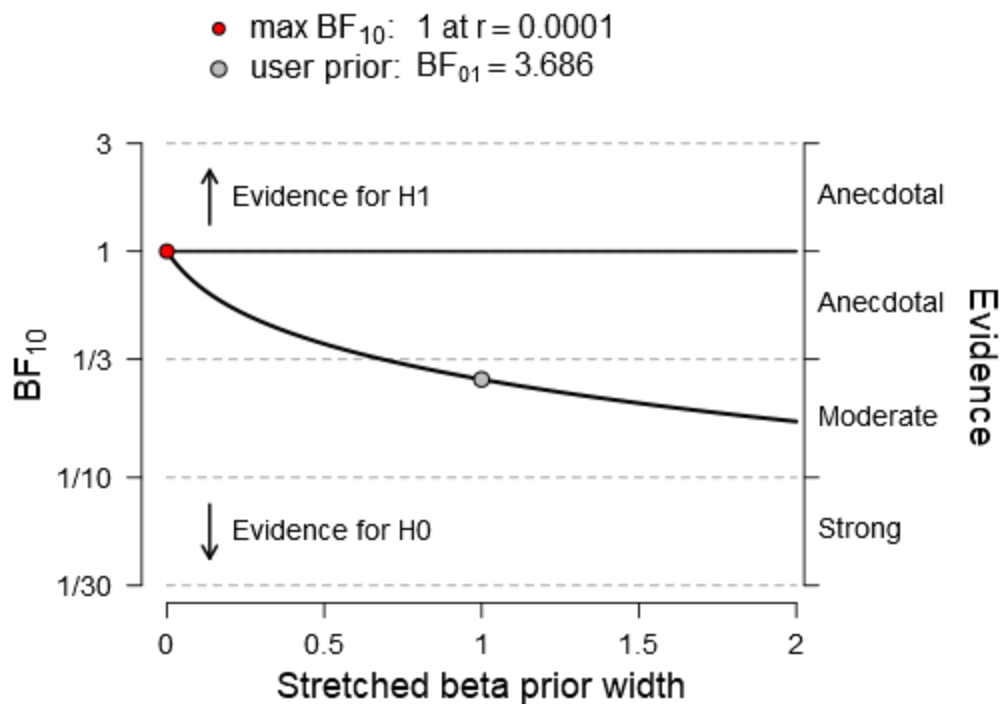


Figure 18. Bayes Robustness check for the Bayesian alternative of the Pearson's-r Correlational analysis of the confidence-pressure relationship within the double-blind condition.

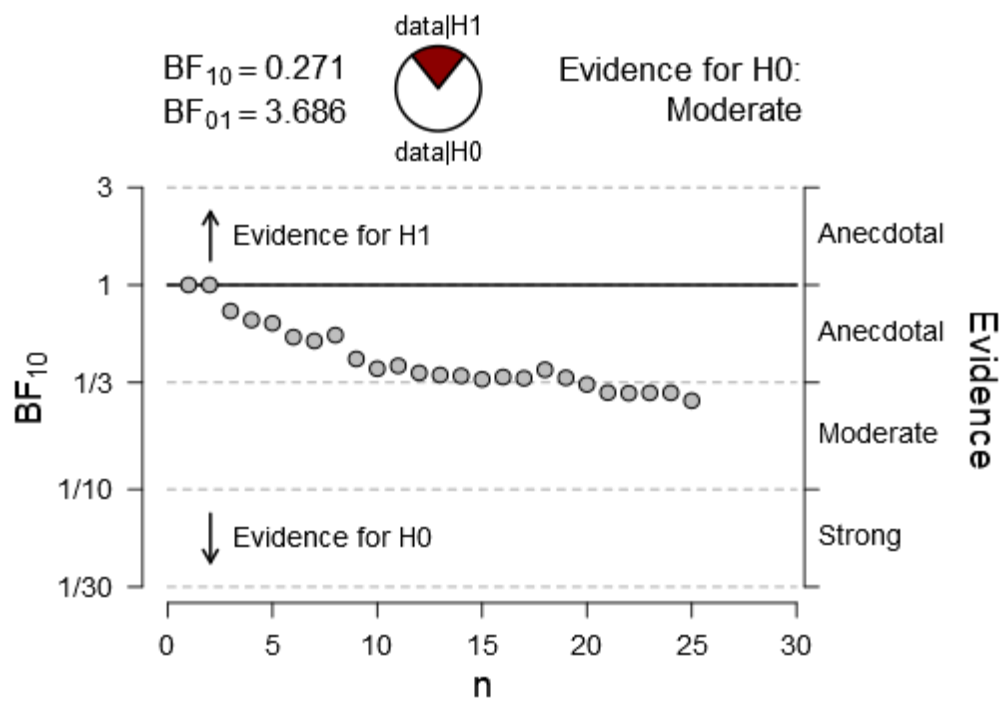


Figure 19. Bayes sequential analysis for the Bayesian alternative of the Pearson's-r Correlational analysis of the confidence-pressure relationship within the double-blind condition.

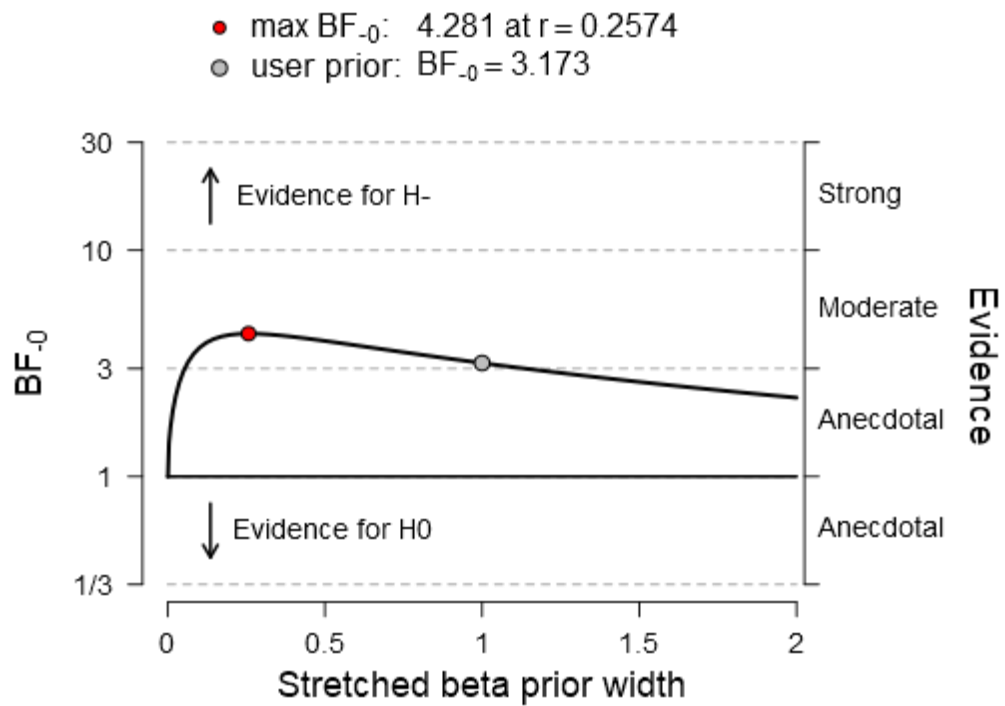


Figure 20. Bayes Robustness check for the Bayesian alternative of the Pearson's-r Correlational analysis of the confidence-pressure relationship within the single-blind condition.

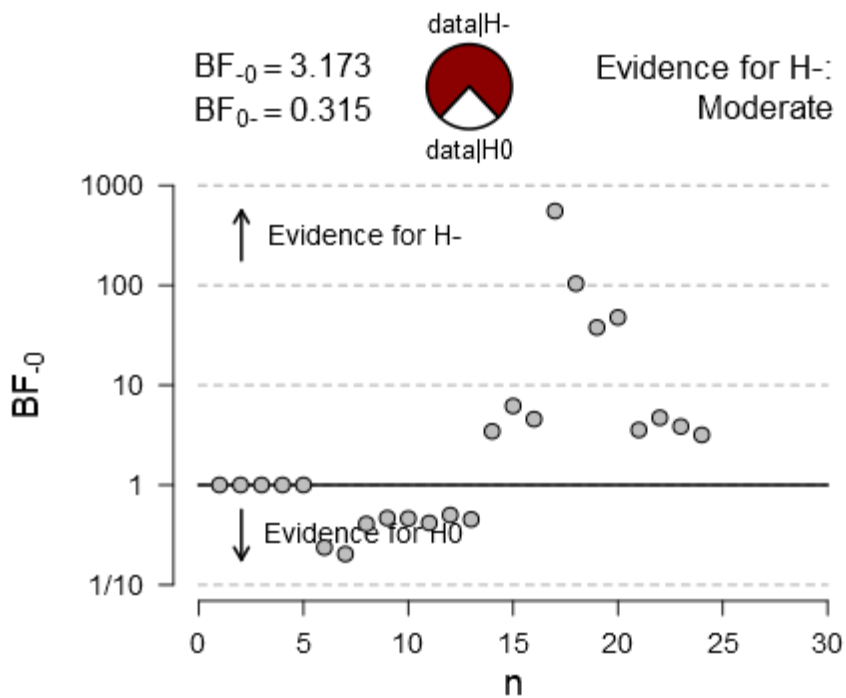


Figure 21. Bayes sequential analysis for the Bayesian alternative of the Pearson's-r Correlational analysis of the confidence-pressure relationship within the single-blind condition.

Appendix G

Eyewitness Identification Line-up Procedure Scoring Rules, Coding Key, and Examples

General Rules for Scoring

- I. Scoring will focus solely on the behaviours of the administrator.
- II. The scoring can be divided into two categories: pre-identification behaviours, and post-identification behaviours.
- III. For each iteration of a behaviour (which will be later outlined) a single point (1) is allocated to the category for that particular video.
- IV. The line-up identification procedure follows the outline process below. It should be noted that the researcher has no direct control over the line-up procedure while it is being conducted. The following process is what was instructed to the participants prior to the line-up procedure by the researcher. Participants may change or omit stages of the procedure (either intentionally, or unintentionally).
 1. The administrator is seated to the left of the witness (closest to the door).
 2. The procedure begins when the researcher leaves the room.
 3. The administrator reads out the instruction, provided by the researcher, to the witness. The instructions were to be communicated verbatim to the witness.

The instructions are as follows:

 - a. As part of the ongoing investigation into a crime we are asking you to view a line-up to see if you recognize anyone involved with that crime
 - b. It consists of six photographs of individuals. Each photograph has a number underneath the photograph
 - c. Take whatever time you want to view the photo array
 - d. Do not look to me for guidance during the procedure.
 - e. Do not assume that I know who the perpetrator is.
 - f. Individuals presented in the photo array may not appear exactly as they did on the date of the incident because features, such as head and facial hair, are subject to change.

however, they do not have a script to communicate this verbatim. The prompt is provided below:

- Please indicate below the confidence of the witness's identification decision on a scale of 0% (not at all confident) to 100% (completely confident).

9. The administrator asks what decision-making process the witness use to make the identification. The administrator reads out two statements (which are provided on the sheet, administrators were instructed to read the statements verbatim), to which the witness had to indicate which one best reflects their decision-making. The manner in which this is asked (not the statements) was at the discretion of the administrator. The prompt, and statements, is provided below:

- Only when the witness made an identification (not a rejection), you must ask them which of the following two statements best reflect how they made the identification decision:
 - The perpetrator just popped out at me and I recognised the perpetrator immediately
 - I used a process of elimination when making my identification decision.

10. The administrator packs the photographs back into the envelope and knocks on the door to indicate to the researcher that the procedure has concluded.

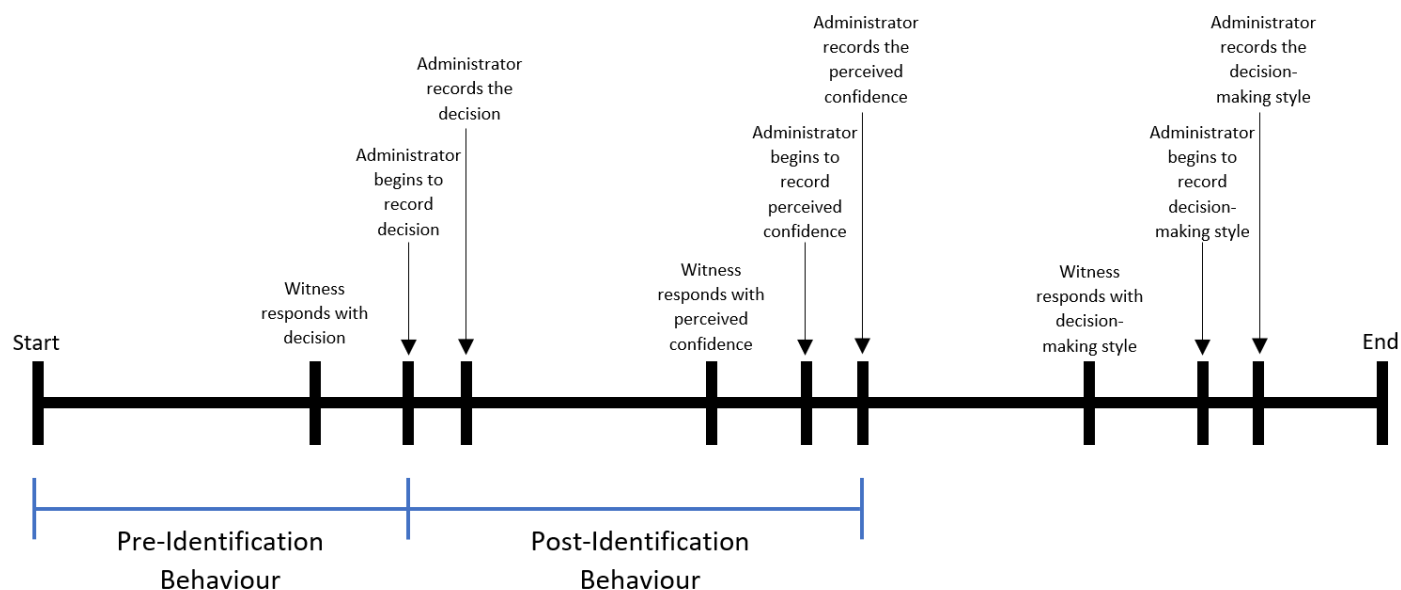
V. A behaviour performed by the administrator can be categorised as a ***pre-identification behaviour*** if it aligns with the following rules:

- a. Any behaviour outlined within the general scoring sheet occurring between beginning of line-up procedure (when the researcher has vacated the room and the administrator begins talking) to the recording of the identification made by the witness.
- b. An identification only occurs when the administrator goes to write down the witness's decision on the instruction sheet.
- c. A response made by an eyewitness that has not been recorded by the administrator is not to be considered an identification.

- d. Any behaviours outlined in the instruction sheet occurring after the recording of the identification is to be considered a post-identification behaviour.
 - e. Any behaviour occurring while the administrator is recording the identification is to be considered a post-identification behaviour.
 - f. The period of recording the identification is as follows:
 - 1. The administrator goes to write the decision on the instruction sheet.
 - 2. The administrator is writing the decision on the instruction sheet.
 - g. If the administrator stops part way through recording the witness's decision, and the decision changes, all behaviours leading up to that point (during the act of recording a decision) is to be considered a pre-identification behaviour.
 - h. If the administrator goes back to change the decision, all behaviours that are outlined in the instruction sheet exhibited up to that point are considered pre-identification behaviours
- VI. A behaviour perform by the administrator can be categorised as a *post-identification behaviour* if it aligns with the following rules:
- a. Any behaviour outlined within the general scoring sheet occurring between the recorded decision of the witness (recorded by the administrator) and the recording of the witness's confidence in their decision (also recorded by the administrator).
 - b. Refer to the pre-identification behaviours section to determine when a response is considered 'recorded'.
 - c. A recording of witness confidence is only considered to be 'recorded' when the administrator indicates the confidence assessment on the instruction sheet.
 - d. Any behaviour outlined in the general scoring sheet occurring before, during, and up to the recording of a witness confidence assessment is to be considered a post-identification behaviour (only occurring after a recorded identification).
 - e. The period of recording the confidence assessment (similarly to recording the identification) is as follows:
 - 1. The administrator goes to write the confidence on the instruction sheet.
 - 2. The administrator is writing the confidence on the instruction sheet.

- f. If the administrator goes back to change the confidence decision, all behaviours that are outlined in the instruction sheet exhibited are considered post-identification behaviour

VII. The figure presented below illustrates the typical timeline of a line-up procedure. This is not strictly the case for every instance, as participants will forget or omit steps, and potentially go back to change previous decisions. Please note that the space between stages on the procedure is NOT indicative of actual time between stages, this is simply a



basic representation of the process.

VIII. Some behaviours exhibited by the administrator may overlap with or be a combination of multiple listed behaviours of interest. If this is to occur, points should be allocated for each behaviour exhibited.

- For example: When the witness provides a response (e.g. a rejection), the administrator both frowns at the witness (1), and states “Remember that facial features can change.” (1)
 - For this situation, points would be allocated to both the “Indicated displeasure when witness makes their decision” and “Told the witness to focus on facial features in a pressuring manner” listed behaviours.

If the behaviour is an overlap of multiple behaviours, then a point should be allocated to the listed behaviours that *best represent* that behaviour.

- For example: The witness decided to reject the line-up, the administrator states, “Why not a photo?” (1) (1) after the witness has made a rejection.
 - For this situation, the listed behaviours that best represent this are the “Told the witness to take another look after making a rejection” and the “Administrator questions the witness’s rejection” behaviours.
- Another example:
 - Witness: “He’s not in there.”
 - Administrator: “Why don’t you look more carefully?” (1) (1)

This is a combination of the “Administrator questions the witness’s rejection” and “Told the witness to look more carefully after the witness indicated a rejection”

- Few instances will occur outside of a question where an overlap of behaviours will occur.

IX. Several behaviours of interest will heavily overlap in description; however, the major difference is the context in which they occur (e.g. a behaviour after the witness acknowledges a photo, provides a rejection response, or provides an identification response). If a scenario is to occur where the witness exhibits one behaviour (e.g. provides a rejection response), then immediately follows up with another (e.g. acknowledges a particular photo), and the administrator exhibits a behaviour of interest (e.g. indicates displeasure), point allocation should be based on the situation immediately preceding the behaviour of interest (therefore, one point allocated to the “Indicated displeasure when the witness acknowledges particular photos” behaviour).

- a. It should be noted, however, that if two different contextual behaviours from the witness occur in quick succession (e.g. the aforementioned scenario), and the

administrator also displays two behaviours of interest corresponding to each of the witness's behaviours, then a point must be allocated to each behaviour.

- b. Furthermore, following the previous scenario, if the administrator exhibits a behaviour of interest after the first witness behaviour, and this carries over into the second witness behaviour (e.g. the administrator is still indicating displeasure), then time should be given to ascertain whether the administrator displays a different behaviour. If the administrator continues to display displeasure after second witness behaviour, then a point is to be allocated to each behaviour of interest (e.g. a point is allocated to both the "Indicated displeasure when the witness makes a rejection" and the "Indicated displeasure when the witness acknowledges particular photo" behaviours).
- c. Finally, any subsequent behaviour of interest occurring after a witness behaviour should be allocated a point. For example: if the witness makes a rejection, any behaviours of interest succeeding this (with a 'witness rejection' as it's context) is to be allocated a point. Such as an indication of displeasure (Indicated displeasure when the witness makes a rejection), telling the witness to take closer look (Told the witness to take another look after making a rejection), or questions the witness rejection decision (Administrator questions witness's rejection).

X. *Behaviours to be Considered for Scoring*

a. *Pre-Identification Behaviours*

1. Told the witness to take their time while studying the photographs
 - Prior to a decision being made, if the administrator tells the witness to take their time while studying the photos, or indicates to the witness not to rush (or states something similarly), then a point is to be allocated.
 - For example:
 - Administrator: "Just take whatever time you need to choose a photo." (1)
 - or
 - Administrator: "There's no rush to make a decision, take your time." (1)

2. Told the witness to look more carefully at photos after the witness indicated a rejection.
 - If the witness indicates that they do not see the suspect, or have indicated that they wish to reject the line-up, the administrator may tell them to look carefully at the photographs *in general*.
 - A point is to be allocated for any behaviour similar to the administrator telling the witness to “look more carefully at the photos.” That is, anytime the administrator states something of similar meaning (e.g. “take a closer look,” “take a better look.” or “why don’t you have a better ‘sus’” at the photos).
 - For example:
 - Witness: “I don’t know, I can’t see him”
 - Administrator: “Why don’t you take a closer look at the photos?” (1)
 - or
 - Witness: “I don’t believe he is in there.”
 - Administrator: “Just take a closer look.” (1)
3. Told the witness to look more carefully at photos after the witness indicated an identification
 - Similar reasoning to the “Told the witness to look more carefully at photos after the witness indicated a rejection” behaviour, however, a point is to be allocated when the witness indicates an identification.
 - For example:
 - Witness: “This looks like the one.”
 - Administrator: “Remember to look carefully at all the photos.” (1)
 - or
 - Witness: “Could probably be one of these.”
 - *motions to two photos*

- Administrator: “You should look carefully at all of them.” (1)
- 4. Administrator tells witness to take more time when they have provided an identification.
 - A point is to be allocated if the witness indicates an identification response, and the administrator specifies that they should take more time, or reminds the witness that they have more time to make a decision.
 - For example:
 - Witness: “Could be him.”
 - Administrator: “You can take whatever time you want to have a look over the others.”
- 5. Administrator tells witness to take more time when they have provided a rejection.
 - Follow similar reasoning to the “Administrator tells witness to take more time when they have provided an identification” behaviour. However, a point is to be allocated when this behaviour is preceded by the witness indicating a rejection decision.
 - For example:
 - Witness: “I don’t think I see him.”
 - Administrator: “Just take more time, it’s alright.”
- 6. Pointed/tapped photo to draw attention to said photo
 - A point is to be allocated if the administrator points at or taps a photo suggestively.
- 7. When the witness enquires about what they need to do or say, the administrator neglects to communicate all the witness’s options.
 - The witness may ask what they need to do; the administrator must state that the witness has the option to either: (i) choose a photograph (make an identification), or (ii) not choose a photograph (reject the line-up).

- If the administrator fails to communicate that the witness has the option to reject the line-up, a point must be allocated.
 - For example:
 - Witness: “So what do I do?”
 - Administrator: “You just have to choose someone from the photos.” (1)
 - An example of the administrator providing all options:
 - Witness: “So what do I do?”
 - Administrator: “If you recognise anyone, just pick them. If you don’t, then you can say it’s none of them.”
8. When the witness enquires about what they need to do or say, the administrator is reluctant or hesitates to communicate all the witness’s options or states an option in such a manner which conveys that one it is lesser than the other.
- Similar reasoning to behaviour “When the witness enquires about what they need to do or say, the administrator neglects to communicate all the witness’s options”. However, the administrator does convey all options available to the witness.
 - Hesitation or reluctance is indicated through a long pause, discourse markers (e.g. well, you know, so), and filler words (e.g. err, um, uh) being present prior to stating that the witness can reject the line-up.
 - There are multiple ways to communicate that one option may be ‘better’ or ‘lesser’ than the other:
 - When communicating one option, convey a sense of uncertainty.
 - For example:
 - Administrator: “Well, sure, you don’t have to pick one.”
 - Convey increased responsibility, on behalf of the witness, surrounding one option compared to the other.

- For example:
 - Administrator: “I guess, it’s up to you if you want to not pick anyone.”
 - Each iteration of this behaviour must be allocated a point; that is, for each instance of either hesitation/reluctance or communicating difference in option ‘value.’ However, *individual* discourse markers, pauses, or filler words are not to be *each* allocated a point.
 - For example:
 - Witness: “So what do I do?”
 - Administrator: “Just pick someone.” *long pause* “Well...I guess – um – (1) you could say it’s none as well.” (1)
9. Told the witness to focus on facial features in a pressuring manner.
- If the witness makes a rejection, the administrator may tell the witness to have a closer look at the photograph members’ facial features. For each iteration of this behaviour, a point should be allocated.
 - For example:
 - Witness: “I don’t think it’s any of them.”
 - Administrator: “Just have a closer look at their facial features.” (1)
 - Consider point allocation when the administrator asks the witness if any facial features stand out, or similarly, if anyone ‘pops’ out.
 - For example:
 - Witness: “I can’t see him”
 - Administrator: “No one stands out at all?”
10. While placing down the photos, the administrator adds emphasis to particular photos (i.e. the suspect)
- This behaviour refers to the verbal emphasis.
 - For example: The administrator counts out the photos during placement; however, emphasis is given to one particular photo:

- Administrator: “One, two, three, *four* (1), five, and six.”

11. Indicated pleasure when the witness acknowledges particular photos

- This can be in the form of smiling, or nodding, and affirming the witness’s acknowledgement verbally (typically, tone is higher with positive phrases such as: “good,” “well done,” and so on). “Acknowledgement” can also include providing an identification response to the administrator. Each iteration of a behaviour is to be allocated a point.
 - For example:
 - Witness: “Well, he looks familiar.”
 - Administrator: *smiles (1) and nods* (1) “That’s good.” (1)
 - or
 - Witness: “I think it might be him.”
 - Administrator: *smiles* (1) “Him? Great.” (1)

12. Indicated displeasure when the witness acknowledges particular photos

- This can be in form of any facial feature that possesses negative connotations. Including: frowning, surprise (raised eyebrows, sustained glaring at the witness), or pursing the lips. This can also include behaviours, and verbal and non-verbal sounds: sighing, shrugging, and shaking one’s head. Verbal disaffirmations are also to be considered. Verbal disaffirmation can be indicative through a lowered tone, lowered voice, or resigned agreement.
- Each iteration of the behaviour is to be allocated a point.
 - For example:
 - Witness: “Well, he looks familiar.”
 - Administrator: *shrugs* (1) “Ok.” (1)

13. Indicated pleasure when witness makes a rejection.

- Follow reasoning from behaviour “Indicated pleasure when the witness acknowledges particular photos.” However, the witness has made a rejection.
14. Indicated displeasure when witness makes a rejection.
- Follow reasoning from behaviour “Indicated displeasure when the witness acknowledges particular photos.” However, the witness has made a rejection.
15. The line-up identification choice was repeated back to the witness in a questioning manner
- To discern whether the administrator is simply responding to the decision made by the witness in an offhanded manner or is questioning the decision itself, some factors must be considered.
 - This behaviour is distinguishable
 - The major indication of whether or not the administrator is questioning the witness’s decision is if the behaviour is followed by a pause (from the administrator) so that the witness may respond.
 - For example:
 - Witness: “I think it may be this guy.”
 - Administrator: “This guy?” *points to card and pauses* (1) (1)
 - Another indication is the facial expression of the administrator. If the administrator repeats back choice with confused, surprised, or concerned facial expression, it is indicative of the administrator questioning the witness’s choice.
 - For example:
 - Witness: “I think it may be this guy.”
 - Administrator: “This guy?” *raises eyebrows and pauses* (1)(1)
 - Finally, an upward intonation (i.e. an increase in pitch) at the end of the questions is typical of an inquisition.

- Ultimately, it is at the discretion of the coder to decide whether or not the behaviour is to be allocated a point.
 - It should also be noted that any other behaviours of interest occurring concurrently with this behaviour (e.g. tapping a photo or indicating displeasure with decision made) also require point allocation.
16. The line-up rejection choice was repeated back to the witness in a questioning manner.
- Follow reasoning from behaviour “The line-up identification choice was repeated back to the witness in a questioning manner.” However, with regards to a rejection decision.
17. Asking/prompting the witness to describe the features of the perpetrator
- A point is to be allocated to this behaviour if the administrator asks the witness to describe the perpetrator back to them after a response is provided, but a decision is not recorded.
18. Telling/prompting the witness to compare photographs
- This behaviour is only considered for point allocation when the administrator has the witness compare photographs.
 - For example:
 - Witness: “It could be him.”
 - Administrator: “Try comparing him with the other photos.”
19. Reminded the witness that feature of the perpetrator can change over time in a pressuring manner.
- This behaviour is only considered for point allocation when the administrator exhibits it when the witness has not made a decision for an extended period of time.
20. Reminded the witness that feature of the perpetrator can change over time in a pressuring manner after witness made an identification.
21. Reminded the witness that feature of the perpetrator can change over time in a pressuring manner after witness made a rejection.

22. Telling the witness, he or she knows whom the suspect is.
- This behaviour is only to be considered if the administrator exhibits another pre-identification behaviour before or after disclosing their knowledge surrounding the line-up procedure.
23. If the witness eliminated multiple photos, through process of elimination, the administrator indicated emphasis/drew attention to the group which contained the perpetrator.
- For example:
 - Witness: *has reduced the number of potential perpetrator (from 6 photos down to 3)*
 - Administrator: “So yeah, you can just pick one of those.”
referring to 3 remaining photos (1)
 - Another example:
 - Witness: *has reduced the number of potential perpetrator (from 6 photos down to 2)* “So I just pick one?”
 - Administrator: “Yeah, just pick one.” (1) (1)
 - Second point is allocated to the “When the witness enquires about what they need to do or say, the administrator neglects to communicate all the witness’s option” behaviour, as the witness asked what they had to do, and the administrator failed to disclose all available options.
24. Administrator stared openly at the suspect photo for extended periods of time.
- A point is allocated when the administrator is looking at the suspect photograph for extended periods of time. It is difficult to determine whether the administrator is simply looking at the photographs or staring at the suspect photograph. However, if the administrator’s eyes do not move from the suspect’s position for several seconds at a time, therefore this should be considered a behaviour of interest.

25. Administrator questions witness's identification

- A point is to be allocated for each question the administrator poses to the witness when they have made their decision. This can be any question surrounding the witness's reasoning for their choice.
- The administrator can respond to a decision in an offhand manner, or just to clarify that the response given by the witness is their final answer.
- Certain factors should be considered when determining if the administrator is questioning the witness includes: a pause after the question, an increase in intonation (which is typically indicative of an inquisition), and when the administrator gives a sustained glance at the witness.
 - For example:
 - Witness: "This one."
 - Administrator: "Why would you pick that one?" (1)
 - Non-example:
 - Witness: "This one."
 - Administrator: "Him? Alright." *Writes down decision*

26. Administrator questions witness's rejection

- Similar to reasoning is to be followed to behaviour "Administrator questions witness's identification".

27. Removing the picture (to check number on other side in order to record identification) after an identification in an obviously slow manner.

- This is only to be considered a behaviour of interest (point allocation), when it is accompanied another pre-identification behaviour.
- For example, it can be in conjunction with "Administrator questions witness's identification/rejection" or "Reminded the witness that feature of the perpetrator can change over time in a pressuring manner."

- Witness: “I think it is this one.”
 - Administrator: “Okay.” *slowly removes photo* “I just want you to remember that the perpetrator’s features could change over time.” (1) (1)
 - If this behaviour is exhibited in conjunction with the “Telling the witness, he or she knows who the suspect is” behaviour, a point can be allocated
 - Witness: “I think it is this one.”
 - Administrator: “Okay.” *slowly removes photo*
 - Witness: “Did you know who the suspect was?”
 - Administrator: “I did.” (1) (1)
28. The administrator places the photographs on the table with a clear positional emphasis towards a photo/suspect.
- This is distinguishable from the “While placing down the photos, the administrator adds emphasis to particular photos (i.e. the suspect)” behaviour through the difference in focus. This behaviour is in regards to how the photo is placed, rather than what the administrator says during placement.
 - For example:
 - If the suspect photo is placed closest to the witness (1)
 - Placement of the suspect is performed concurrently with a pause and/or a glance towards the witness (1)
 - The suspect photo is placed in such a way that clearly delineates it from the other photos
 - For example: the photo is placed away from the rest (1)
29. The administrator did not read certain sections of the instructions.
- A point is allocated for each section (excerpt of the instructions provided in section IV.3 of the general scoring sheet) that is omitted.

- For example: Administrator reads out instructions verbatim except the sections (d and e):
 - Do not look to me for guidance during the procedure. (1)
 - Do not assume that I know who the perpetrator is. (1)
- If the general idea of the section is communicated, but it is changed somewhat, no point should be allocated.
 - For example: Administrator paraphrases instruction section (f):
 - Individuals presented in the photo array may not appear exactly as they did on the date of the incident because features, such as head and facial hair, are subject to change.

Changed to:

- Photos may not depict individuals as they appeared on the day of the crime, because the perpetrator's hair could've changed, or gain scars from that time.
 - Also, the section omitted is to be recorded along with the allocation of the points.
 - For example: Administrator omits sections d, e, and f. Therefore, 3 points are allocated (1)(1)(1), and the three instruction section 'letters' are to be recorded.
30. Administrator motions towards other photos in conjunction with exhibiting another pre-identification behaviour.
- This behaviour is to be allocated a point when the administrator exhibits a pre-identification behaviour that involves drawing attention back to the photos, in conjunction with the act of motioning towards other photos.
 - Overall, a point is allocated to both the "hand motion" and the pre-identification behaviour adjoining it.

- For example:
 - The witness makes an identification and provides a response to the administrator.
 - Prior to recording the decision, the administrator states: “So remember that facial features can change over time.” (1) While using their hand to motion towards the other photos within the line-up. (1)

b. *Post-Identification Behaviours*

1. Administrator indicated pleasure when witness made an identification
 - This can be any affirming behaviour (whether in combination or in isolation), including: smiling at an identification, nodding, or verbally affirming the identification. Each iteration of a behaviour is to be allocated a point.
 - For example:
 - Administrator: “This one?”
 - Witness: “Yeah.”
 - Administrator: *goes to write down decision*
smiles (1) “That’s good.” (1)
2. When administrator asks for witness perceived confidence in their decision and conveys a sense of uncertainty to the witness.
 - The administrator conveys uncertainty within their statements/questions; specifically, around asking for witness confidence.
 - For example:
 - Administrator: “I guess, how certain that you chose correctly?” (1)
3. Administrator indicated displeasure when witness made an identification.
 - This can be any disconfirming behaviour (whether in combination or in isolation) including: frowning at identification, raising eyebrows, pursing of lips, sighing, shrugging, and verbally

disaffirming the identification (this is typically done through resigned agreement).

- For example:
 - Administrator: “This one?”
 - Witness: “Yeah.”
 - Administrator: *writes decision while frowning and pursing lips* (1) “If you say so.” (1)
- 4. Administrator indicated displeasure when witness made a rejection.
 - This can be any disconfirming behaviour (refer to the Administrator indicated displeasure when witness made an identification behaviour).
- 5. Administrator indicated pleasure when witness made an identification
 - This can be any confirming behaviour (whether in combination or in isolation) including: smiling or nodding. Verbal affirmations should also be considered (similarly to the “Indicated pleasure when the witness acknowledges particular photos (Pre-identification)” behaviour), including positive phrases in conjunction with a higher tone of voice.
 - For example:
 - Witness: “I’m just going to say that it’s him.”
 - Administrator: *smiles* (1) “Alright, excellent.” (1)
- 6. Administrator questions witness identification
 - Follow reasoning indicated in behaviour “Administrator questions witness’s identification (Pre-identification)”, however, questions are posed after an identification (follow reasoning for determining pre-identification and post-identification behaviours).
- 7. Administrator questions witness rejection.
 - Following reasoning indicated in behaviour “Administrator questions witness rejection (Pre-identification)”.
- 8. Administrator tells the witness, he or she knows who the suspect is.

- This behaviour is only to be considered if the administrator exhibits another pre- or post-identification behaviour before or after disclosing their knowledge surrounding the line-up procedure.
9. Administrator records decision of the witness in an obviously slow manner.
- A point should only be allocated if the administrator waits for a change in decision (i.e. through a pause, or repeated glances to the witness).
 - This behaviour also encompasses stalling from the administrator.
 - For example:
 - When the witness has made their decision, the administrator takes an extended period of time to write the decision. This can be expressed through constant fidgeting, but the decision is not being written.
10. Administrator asks: “are you sure?” after the witness made an identification.
- Distinguishable from behaviours “Administrator questions witness identification” and “Administrator questions witness rejection”, as this behaviour focuses on the question “are you sure?” (or questions similar to it) and not questions that are aimed at the reasoning of their identification.
 - For example:
 - Administrator: “Are you sure that this is the offender?”
 - An example that isn’t to be considered a “Administrator asks: “are you sure?” after the witness made an identification” behaviour:
 - Administrator: “Why wouldn’t you pick this person here?”
11. Administrator asks: “are you sure?” after the witness makes a rejection

- Follow similar reasoning to behaviour “Administrator asks: “are you sure?” after the witness made an identification,” adapt to a rejection decision.
12. Immediately records decision when witness conveys uncertainty towards their response.
- This behaviour is to be allocated a point when the witness provides a decision, but they are obviously unsure about the response, and the administrator immediately records the decision without hesitation.
 - For example:
 - Witness: “So...probably that one?”
 - Administrator: *immediately records decision* (1)
 - A non-example:
 - Witness: “It might be him?”
 - Administrator: “Him?” *pause* “Alright.”
13. Suggests a high confidence level when asking for witness’s confidence assessment.
- This behaviour is to be allocated a point when the administrator assumes/suggests a high confidence level after asking for the witness’s perceived confidence in their decision. Any suggestion above 50% is to be considered a high confidence level suggestion.
 - For example:
 - Administrator: “How confident do you reckon you are? 100%?” (1)
14. Suggests a low confidence level when asking for witness’s confidence assessment.
- Similar to the “Suggests a high confidence level when asking for witness’s confidence assessment” behaviour, however, the administrator suggests a low confidence level (any suggestion below 50%).
15. Administrator states that they don’t need to go through final sections of the instruction sheet due to the witness not identifying a photograph.

- A point is to be allocated if the witness makes a rejection, and the administrator states that they do not need to go through the last part of the instruction because of the witness's rejection.
 - For example:
 - After witness has made a rejection, and the administrator records it.
 - Administrator: "Alright, well, we're all done, because you didn't make an identification."
16. Administrator laughs when asking for witness's perceived confidence in their decision.
- A point is to be allocated when the administrator laughs at any point throughout the recording of the witness's confidence assessment. Furthermore, witnesses may laugh in response to the questions, whereby the administrator may also laugh – in this case, a point should be allocated.
17. Asks for witness confidence assessment in a congratulatory manner.
- This behaviour is only to be considered when tone and manner of communication is complimentary of the witness's decision.
 - It is at the discretion of the coder to determine what is considered congratulatory. Ways to determine this to look for positive cues from the administrator during the inquiry for the witness's confidence assessment.
 - This is typically indicative through smiling and an increased tone of voice.
 - For example:
 - Administrator: *smiles* "So on a scale of 0 to 10, what is your confidence in your identification decision?" (1)
18. Asks for witness confidence assessment in an accusatory manner.
- This behaviour is only to be considered when tone and manner of communication is almost aggressive (accusatory).

- As with the “Asks for witness confidence assessment in a congratulatory manner” behaviour, it is at the discretion of the coder to determine what is considered accusatory. Ways to determine this is to look for emphasis on pronouns directed at the witness and the decision they made. This is typically indicative of increased placement of responsibility on the witness, which conveys an accusation rather than a question.
 - For example:
 - Administrator: “So what is *your* confidence that *this man* is the perpetrator?” (1)
 - Or the following;
 - Administrator: “Can *you* tell me *your* confidence that the perpetrator *is not* in *this* line-up?” (1)
- Another factor to consider is the tone of the administrator. Lowered tone with a higher volume is indicative of an accusatory question.
- Finally, negative facial expressions accompanying the question are another factor that is indicative of an accusation. Facial expressions will typically coincide with displeasure towards the witness (e.g. frowning, raising eyebrows, or pursing of lips).

XI. There are 49 videos in total. All behaviours are to be recorded on the excel sheet, with the corresponding video. The number of points allocated to each behaviour is to be placed into the score column with the corresponding behaviour number (e.g. “Asks for witness confidence assessment in an accusatory manner” is post-identification behaviour 18). Finally, videos 11, 20, and 21 have been omitted, therefore these recording tables have also been omitted from the excel file. Please also note that during the recording of video 16, there was a technical malfunction which caused the video to end early.