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Partial Memory: Another Reason for using Large Lineups?

Kısmi Hafıza: Kapsamlı Yüzleştirmeye Başvurulması için Bir Başka Neden mi?

Avraham LEVI

ORCID: A.L. 0000-0002-1947-6477

ABSTRACT

Introduction: The 48-person lineup has been found to decrease substantially mistaken identifications, with little cost to correct ones. The goal of this experiment was to increase correct identifications.

Purpose: Study 1 attempted to increase identifications in the 48-person lineup by omitting the warning that the target may not be in the lineup. Study 2 aimed at examining potential reasons why the attempt failed.

Method: In study 1 a 48-person lineup was shown, with or without the warning and with the target present or absent. In study 2 target-present lineups were shown, either a six-person or 48-person lineup. All were then asked to count the number of lineup members that they could discount as not being the target.

Results: Study 2 found that after discounting six-person lineups were left with 1 lineup member, in 48-person ones 8.3.no difference in the number of identifications between the two warning conditions. Six-person lineups yielded more identifications.

Conclusions: The results suggest that witnesses in 6-person lineups achieve more identifications by discounting lineup members and guessing from the remaining. Further research is suggested.

Keywords: Eyewitness identification, 48-person lineups, partial memory

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Corresponding author: Avraham Levi, E-mail: avmlevi@bezeqint.net

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1. Introduction

The lineup is the safest eyewitness identification procedure, because the foils provide some protection to an innocent suspect. However, witnesses often choose someone who is not the culprit[1]. When that person is not the suspect, the police are aware that they have erred. However, in a fair simultaneous lineup by chance these witnesses who choose "identify" a suspect who is innocent 1/N times, where N is the lineup size. With the American lineup size of six, this will happen 1/6=0.167, or almost 17% of the time.

There is a second error that witnesses make and which remains undetected by the police: witnesses fail to identify guilty suspects[2]. While a number of lineup procedures have been developed to reduce mistaken identifications[3], there are few procedures available to increase correct ones that do not simultaneously increase mistaken ones. Witnesses often have imperfect memory[4] and can then only increase correct identifications if they choose someone in the lineup more often. Doing this increases mistaken ones.

The danger of mistaken identifications has been considered so great that in the wake of research showing that we can reduce them if we warn witnesses that the culprit may not be in the lineup[5], the warning has been included in one of four recommendations of a White Paper of the American Psychological Association[6] to improve lineup identification evidence.

1 Edward Connors, Thomas Lundregan, Neal Miller and Tom McEwen, convicted by juries, exonerated by science: Case studies in the use of DNA evidence to establish innocence after trial. (U. S. Department of Justice 1996); Barry Scheck, Peter Neufeld, and Jim Dwyer, Actual innocence: When justice goes wrong and how to make it right. (first published 2000, 1st, Signet 2001); Tim Valentine, Alan Pickering, and Stephen Darling,' Characteristics of eyewitness identification that predict the outcome of real lineups' [2003] 17 Applied Cognitive Psychology 969; Gary L Wells, Mark Small, S Penrod, Roy S Malpass, Solomon M Fulero, and Clara Allison Elizabeth Brimacombe, 'Eyewitness identification procedures: Recommendations for lineups and photospreads' [1998] 22 Law and Human Behavior 603.

2 Avraham M Levi, 'Are defendants guilty if they were chosen in a lineup?' [1998] 22 Law and Human Behavior 389.

3 Avraham M Levi, 'An Analysis of Multiple Choices in MSL Lineups, and a Comparison with Simultaneous and Sequential ones' [2006] 12 Psychology, Crime, & Law 273; Avraham M Levi, 'Much Better than the Sequential lineup: A 120-person lineup' [2012] 18 Psychology, Crime & Law 631; Roberto Cameron Lodge Lindsay and Gary Wells, 'Improving eyewitness identifications from lineups: Simultaneous versus sequential lineup presentation' [1985] 70 Journal of Applied Psychology 556; S Pryke, Roberto Cameron Lodge Lindsay, Jennifer E Dysart and Paul Dupuis, 'Multiple independent identification decisions: A method of calibrating eyewitness identifications' [2004] 89 Journal of Applied Psychology 73.

4 Robert Buckhout, 'Eyewitness memory' [1974] 231Scientific American 23.

5 Roy S Malpass and Patricia G Devine, 'Eyewitness identification: Lineup instructions and the absence of the offender' [1981] 66 Journal of Applied Psychology 482.

6 Gary L Wells, Mark Small, Steven Penrod, Roy S Malpass, Solomon M Fulero, and Clara Allison Elizabeth Brimacombe, 'Eyewitness identification procedures: Recommendations for lineups and photospreads' [1998) 22 Law and Human Behavior 603.

2. Study 1: A failed attempt to increase identifications by omitting the warning

Levi[7] has been experimenting with very large lineups, the largest consisting of 120 members. The two consistent findings have been that both the number of correct identifications and the amount of choosing when the target is absent (mistaken choices) remains constant and comparable to small lineups even as the lineup grows from 24 to 120 members. The result has been a dramatic reduction in mistaken identifications at no cost to correct ones. For example, with a typical rate of 50% mistaken choices in the traditional six-person target –absent simultaneous lineup, if the lineup is fair the expected rate of mistaken identifications is 50/6 = 8.3%. With a lineup of 48, the same percentage of mistaken choices leads to 50/48 = 1% mistaken identifications.

What might happen, then, if the warning was omitted before a 48-person lineup? We might expect an increase in mistaken choices, perhaps to about 75%[8] in target-absent lineups, and therefore mistaken identifications would be 75/48 = 1.56%. We would thus be paying the price of about half a percent more mistaken identifications by omitting the warning. The empirical question is what the gain in target identifications will be if the warning is omitted.

2.1. Method

2.1.1. Participants

The 192 participants in this experiment were staff and graduate students at the Givat Ram and Mt. Scopus campuses of the Hebrew University in Jerusalem, Israel who agreed to participate in a short and interesting experiment on memory which would involve viewing a two- minute video, and later participating in a five- minute experiment in their office/lab. There were 41 male participants, and 151 female ones. The average age of the participants was 37.

2.1.2. Design

The design was 2x2 between-subjects, the factors being target-absent vs. target-present, and warning vs. no warning. The number of 48 participants per each of the

7 Avraham M Levi, 'A Comparison Between Large Simultaneous and MSL Lineups, with Photos Viewed in Sets of Six' In K Nixon (Ed.) Forensic recall and eyewitness testimony (A-IP Publishing 2006b); AM Levi, 'Evidence for Moving to an 84-Person Photo Lineup' [2007] 3 Journal of Experimental Criminology 377; Avraham M Levi, 'Much Better than the Sequential lineup: A 120-person lineup' [2012] 18 Psychology, Crime & Law 631.

8 Roy S Malpass and Patricia G Devine, 'Eyewitness identification: Lineup instructions and the absence of the offender' [1981] 66 Journal of Applied Psychology 482.

four experimental conditions was determined by completely counterbalancing the 24 possible orders of the four screens of photos, each order appearing twice in random order in the experiment for each of the four conditions.

2.1.3. Recruitment and eyewitness event

The author visited offices and labs at the university. He introduced himself, and asked the occupant whether they would participate in a memory experiment in their office/lab at a later time that would last only about five minutes. If a person agreed, he immediately showed them a video in their office lasting 2 minutes in which the target was seen for 37 seconds, another young-looking male for 22 seconds[9]. He arranged a mutual acceptable time for the experiment, at least an hour later. The video and the lineup were shown on a laptop computer.

2.1.4. The lineup

Photos for the lineups were chosen from Levi[10]. All lineup members were young adult males who had dark and short hair, dark eyes, no beard or moustache, and were of medium build. The target also fit this description. The photos were thus chosen to fit the match-to description criterion[11], and there is thus no danger that any of the photos could be discounted because they did not fit that description[12]. The twelve faces of each screen were organized in two lines of six. The four screens were identical for the target-present and target absent lineup, except that the target was placed in the lower left hand corner in one of the target-present lineup's screens, and replaced with a different photo in the culprit-absent lineup.

2.1.5. Lineup procedure

Witnesses in the warning condition were told: "I am now going to conduct a lineup. The person you are to identify is the male in the video who moved around. The lineup consists of 4 screens with 12 photos in each one. Since all the photos are

9 The video was a natural domestic scene showing a mother diapering her baby in the baby's room, a young-looking male and an older woman sitting in the living room, and the target moving into the living room, sitting down, putting on his shoes, and moving in and out of the room where the mother was diapering the baby. The video can be viewed at www.youtube.com/watch?v=wmbBujTSngo

10 Avraham M Levi, 'Much Better than the Sequential lineup: A 120-person lineup' [2012] 18 Psychology, Crime & Law 631.

11 Gary L Wells, Mark Small, S Penrod, Roy S Malpass, Solomon M Fulero, and Clara Allison Elizabeth Brimacombe, 'Eyewitness identification procedures: Recommendations for lineups and photospreads' [1998] 22 Law and Human Behavior 603.

12 There is a more extensive discussion of the match-to-description strategy in the general discussion section.

different, the person can only appear in one screen, if at all. I will first show you the 4 screens in a predetermined order, but after that you can request to see screens again in any order until you come to a decision[13]. However, I must warn you that the person may not be in the lineup at all!"[14] This last sentence was said with emphasis.

Witnesses who were not warned were given nearly identical instructions, except that the phrase "if at all" and the last sentence were omitted. If witnesses asked at any time whether they could conclude that the person was not in the lineup, they were answered in the affirmative. The witnesses were shown the four screens regardless of whether they chose someone in one of the earlier screens. They were given the opportunity to change their minds after viewing all the screens. (However, this very rarely happened)

2.2. Results and Discussion

Table 1 summarizes the results for all four conditions.

Table 1: *Results for four experimental conditions*

	WARNING	NO WARNING
TARGET- PRESENT		
IDENTIFICATIONS	17 (36%)	17 (35%)
FOILS	21 (44%)	28 (57%)
NO CHOICE	9 (19%)	4 (8%)
TOTAL	47	49
TARGET-ABSENT		
CORRECT NO CHOICE	25 (50%)	7 (15%)
MISTAKEN CHOICE	25 (50%)	41 (85%)
TOTAL	50	48

The empirical question asked was: What would be the effect of omitting the warning on target identifications in target-present lineups?

The answer to the question could not be more clear-cut. Omitting the warning in target-present lineups has no effect whatsoever on target identifications in target-present lineups. The 36% identifications with the warning and the 35% identifications without the warning are virtually identical.

13 Some additional instruction was added because, contrary to other experiments, the lineup photos stretched over four screens.

14 This warning was stronger than usually given, to ensure that it was heard. Police officers might be afraid to use a strong warning, in that it might deter witnesses from identifying culprits. The results of this paper show that such fear is likely unfounded.

This cannot be accounted for by a failure of the lack of a warning to be effective. Omitting the warning in culprit-absent lineups had a very large effect. While with the warning the usual 50/50 split between correct no choice responses and mistaken choices has been maintained, without the warning 85% of the witnesses chose mistakenly [test between two proportions[15], $z = 3.73$, $p < 0.0001$].

Two explanations for the lack of effect of omitting the warning: Firstly, the percentage of witnesses able to identify the target varies with conditions such as the difficulty of the eyewitness event and the time interval between the witnessing and the lineup. The eyewitness event was relatively difficult. Thus, perhaps the maximum degree of identifications for the experimental conditions was reached with the warning, and therefore omitting the warning was not able to increase them. The extra response bias expressed itself in more foil choices and less no choice responses (though the power of the chi-square testing for the difference was too small).

By the same token, the fact that Clark[16] found that "identifications" increased without the warning in six-person lineups clearly indicates that the maximum degree of these "identifications" was not reached with the warning in the sample he analyzed. Obviously, the chance of increasing "identifications" in a six-person lineup is much greater than in a 48-person one by merely guessing. However, Clark found an "identification" rate greater than would be predicted by pure guessing. The discrepancy between the data Clark analyzed and the present experiment may result because of the difficult eyewitness event which did not enable more identifications without the warning

There is an alternate explanation. Some witnesses have a partial memory of the target[17], which enables them to eliminate from consideration at least one of the foils (i.e. "the target had more hair"). Some of the witnesses in this experiment spontaneously pointed to some foils and said that they could discount them. Penrod[18] also alludes to the concept of partial memory, as does Steblay[19].

15 Ronald E Walpole, Introduction to Statistics (Macmillan 1968).

16 Steven E Clark, 'A Re-examination of the Effects of Biased Lineup instructions in eyewitness identification' [2005] 29 Law and Human Behavior 575.

17 Anthony N Doob and Herschi M Kirshenbaum, 'Bias in police lineups-partial remembering' [1973] 1 Journal of Police Science and Administration 287.

18 Steve Penrod, Eyewitness guessing and choosing (Sarmac Conference, Bethel College, Maine 2006).

19 Nancy M Steblay, 'Social influence in eyewitness recall: A meta-analytic review of lineup instruction effects' [1997] 21 Law and Human Behavior 283.

Partial memory is not simply weak memory. Partial memory requires remembering some aspect of the targets face well enough to discount lineup members who failed to display that feature.

In 48-person lineups partial memory helps little. Too many foils remain. In a six-person lineup, even being able to eliminate only one foil and guessing from the remaining five increases meaningfully the odds of "identifying" the target. Without the warning and the concomitant tendency to choose more, the target will be chosen more often.

However, these additional "identifications" are not real identifications. They are only educated guesses based on partial memory.

Moreover, we cannot be certain that all the "identifications" made with the warning are true ones. 50% of witnesses viewing a fair simultaneous target-absent lineup, with the warning, mistakenly choose someone. That leaves plenty of room for witnesses to make educated guesses in target-present lineups. The conclusion, if this explanation is correct, is that if we want to be sure that "identifications" are indeed identifications, we need to use large lineups.

The concept of partial memory is different from relative judgment, which posits that witnesses compare between lineup members and pick the lineup member that seems most similar to the target. Partial memory and relative judgment are conflicting explanations for why witnesses choose the target despite imperfect memory, or mistakenly chose the innocent suspect as often as they do in six-person lineups. Levi[20] conducted an eye tracker experiment based on the assumption that witnesses use relative judgment. The results forced him to the conclusion that the assumption was false[21]. Partial memory now provides an explanation to his data.

The great advantage of large lineups is obvious in reducing the chance of mistaken identifications. This study suggests that large lineups may also provide an accurate distinction between witnesses who are really able to identify the target and others who may have partial memory of the target.

20 Avraham M Levi, 'When the relative judgment theory proved to be false' [2015] 5 Psychology and Law 141.

21 Not everyone accepts this interpretation of the results. Rod Lindsay for one (personal communication, June 2014) does not.

3. Study 2: Testing the validity of partial memory

The attempt in study 1 to increase identifications by omitting the warning failed. This could be attributed either to the difficult experimental conditions, or to partial memory of the target enabling witnesses viewing six-person lineups to discount some of the foils, thus increasing the chance of choosing the target when making an educated guess.

This experiment aimed at examining this hypothesis directly, versus the alternate explanation that the results of Study 1 were simply the result of its difficult experimental conditions. Witnesses were shown either a six-person or 48-person target-present lineup, with or without the warning. If they made a choice they were asked to count the number of lineup members that they could discount with certainty. Target-absent lineups were omitted, as not relevant to the opposing hypotheses.

If experimental difficulty explains Study 1's results, 6-person lineups should produce no more identifications than 48-person ones, and no more identifications when not warned than when warned. If the partial memory hypothesis is correct more identifications in the six-person lineup will be found than in the larger one.

3.1. Method

3.1.1. Participants

The 200 participants in this experiment were staff and graduate students at the Givat Ram and the Ein Kerem campuses of the Hebrew University of Jerusalem, Israel, and at Bar Ilan University in Ramat Gan, Israel, who agreed to participate in a short and interesting experiment on memory which would involve viewing a two-minute video immediately, and later participating in a five- minute experiment in their office/lab. The average age was 32. Males comprised 84 of the sample, females 116.

3.1.2. Design

The design of the experiment was 2 x 2 between-subjects, the factors being warning (yes/no) and lineup size (6/48). The dependent measures were lineup decision and number of lineup members that could be discounted with certainty.

3.1.3. Recruitment and eyewitness event

They were identical to study 1

3.1.4. The lineups

The 48-person lineup was identical to Study 1. The six-person lineup was created by randomly choosing five photos from the target-present screen of the 48-person lineup, the sixth person being the target. The six faces of the six-person lineup were organized in two rows of three, with the target in the lower le-ft hand position.

3.1.5. Lineup procedure

Witnesses in the no warning six-person condition were told: “I am now going to conduct a lineup. The person you are to identify is the male in the video who moved around.” For those in the warning six-person condition they were also told. “However, I must warn you that the person may not be in the lineup at all!” This last sentence was said with emphasis

Those in the 48-person warning condition were also told:” The lineup consists of 4 screens with 12 photos in each one. Since all the photos are different, the person can only appear in one screen, if at all. You can request to see screens as often as you want in any order until you come to a decision. However, I must warn you that the person may not be in the lineup at all!”

Witnesses shown the 48-person lineup who were not warned were given nearly identical instructions, except that the phrase “if at all” and the last sentence were omitted. If witnesses asked at any time whether they could conclude that the person was not in the lineup, they were answered in the affirmative. The witnesses who were shown the 48-person lineups were also shown the four screens regardless of whether they chose someone in one of the earlier screens. They were given the opportunity of changing their mind after seeing all the screens. The screen with the target appeared randomly as the second or third screen shown.

Those witnesses who chose someone were asked to count the number of lineup members that they could discount with certainty.

3.2. Results and Discussion

Table 2 shows the identification responses.

Table 2: *Results for identification responses*				
	Six-person	Lineups	48-person	Lineup
	Warning	No warning	Warning	No warning
Identification	27 (54%)	31 (61%)	17 (37%)	21 (39%)
Foils	6 (12%)	18 (35%)	14 (30%)	26 (48%)
No choice	17 (34%)	2 (4%)	15 (33%)	7 (13%)

Warned witnesses made fewer foil choices compared to no choices than did not warned witnesses ($\chi 2 = 21.85$, $p < 0.00001$). This verifies that the warning manipulation was effective. There is no difference between the number of identifications between warned and not warned witnesses who viewed the six-person lineup, as there is not between these two groups for the 48-person lineup (this latter finding replicating Study 1). This supports the explanation that experimental difficulty caused the lack of difference between warned and not warned in Study 1.The third finding is that there were more identifications in six person lineups than in 48-person lineups, 58% versus 38% ($z = 2.696$, $p < 0.004$), which fits the logic that the six-person lineup witnesses had a better chance of picking the target when guessing from the far fewer foils than in the 48-person lineup left after discounting some of the five foils: The mean number of foils left after discounting for the six-person lineup witnesses was 1.0, and for the 48-person lineup witnesses 8.3, $z = 3.273$, $p< 0.0005$. Note that while witnesses who viewed the 48-person lineup were able to discount a substantial number of lineup members, they were left with more members than in the six-person lineup. We might expect, also, that the likelihood that witnesses would even think about discounting lineup members while viewing the lineup was small.

The results support the contention that the number of times that witnesses choose the target in 6-person lineups is an unreliable indication of the number of targets who have been identified. In addition to the known chance of choosing the target 1/6 times with pure guessing in a fair lineup, there is also the possibility that due to partial memory of the target more witnesses have succeeded in choosing the target despite their actual inability to identify him or her. We may be much safer with a large lineup such as the 48-person lineup used in this experiment.

A third possible explanation for the higher rate of identification in six-person lineups is that witnesses get confused seeing so many faces in the 48-person lineup However, no difference in the rate of identifications was found between a 24-person

lineup and a 120-person lineup[22]. One might expect more confusion, and fewer identifications, in the far larger 120-person lineups.

Similarly, Levi[23] compared the 48-person lineup to the British video lineup. The latter lineup consists of 10 members, each shown in a short video- clip. The lineup is shown twice before witnesses make their choice. Despite the large difference in size between the two lineups, no difference was found in rate of identification. Witnesses viewing the British lineup are a lot less likely to use partial memory to discount lineup members because the videos are shown sequentially rather than simultaneously. A sequential presentation seems far less likely to give witnesses the idea that they can discount lineup members.

On the other hand, a sequential presentation shown twice should give witnesses more opportunity to compare between lineup members and pick the person that seems most similar to the target. The fact that the British lineup yields more identifications than the 48-person lineup is more evidence that the mechanism behind more identifications in six-person lineups is not relative judgment.

An important caveat is that this study has not proven that witnesses in six-person lineups actually use their partial memory in order to discount some lineup members. The evidence supports this conclusion. The uncertain status of any theoretical construct such as partial memory is nicely illustrated by the relative judgment explanation, a perfectly sensible idea, which seems now to be discredited. In summation, the scientific process works by disproving theories, not proving them.

There is an alternate explanation, signal detection theory According to Wixted and Mickes[24] interpretation of signal detection theory, the larger the lineup, the fewer correct and false IDs there will be. While this prediction fits the present experiment's results, it contradicts the results of Levi[25], who found that as lineups grew in size from 20 to 120, the number of correct IDS and mistaken choices remain constant, and Levi's[26] comparison between the 48-person lineup and the British one.

22 Avraham M Levi, 'Comparing the English Video Lineup with the 48-Person Lineup' [2017] 5 Universal Journal of Psychology 239.

23 Avraham M Levi, 'When the relative judgment theory proved to be false' [2015] 5 Psychology and Law 141.

24 John T Wixted and Laura Mickes, 'ROC Analysis Measures Objective Discriminability for any Eyewitness Identification Procedure' [2015] 4 Journal of Applied Research in Memory & Cognition 329.

25 Avraham M Levi, 'Much Better than the Sequential lineup: A 120-person lineup' [2012] 18 Psychology, Crime & Law 631.

26 Avraham M Levi, 'Comparing the English Video Lineup with the 48-Person Lineup' [2017] 5 Universal Journal of Psychology 239.

Thus, all alternate theories to explain the higher rate of identifications in six-person are contradicted by other evidence. This leaves, so far, the partial memory explanation. This of course does not negate the possibility that another theory may explain this fact, nor the possibility that further research will contradict the partial memory explanation.

For example, witnesses in the second study were asked to count the number of lineup members they could discount after they viewed the lineup. Partial memory as a cause of increased identification should be expected to increase if they were asked to discount lineup members before they view the lineup. Such an experiment is currently being run. The same reasoning holds for the British lineup, and an experiment has been prepared to test this prediction.

In conclusion, then, simultaneous six-person lineups, even when fair, seem even less safe than previously thought. Partial memory may enable some witnesses to seem to identify the target when they actually are not really able to do so.

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