Improving the identification accuracy of senior witnesses: Do pre-lineup questions and sequential testing help?

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Abstract

Eyewitness research has identified sequential lineup testing as a way of reducing the level of false lineup choices while maintaining the level of accurate identifications. The current study examines the usefulness of this procedure for reducing false choices in older adults. Young and senior witnesses viewed a video of a crime and were later presented with target present or absent lineups in a simultaneous or sequential format. Additionally, some participants received pre-lineup questions about their memory for perpetrator’s face and their confidence in their ability to identify the culprit or to correctly reject the lineup. The sequential lineup reduced false choosing rates among young and older adults in target absent conditions. However, in target present conditions, sequential testing significantly reduced the correct identification rate in both age groups. Pre-lineup questions did not significantly influence identification accuracy.
Improving the identification accuracy of senior witnesses: Do pre-lineup questions and sequential testing help?

Much eyewitness research has been devoted to the development of techniques or procedures for reducing eyewitness error. In a conventional simultaneous lineup, all faces are viewed at the same time and thus there is a tendency to select the member of the lineup who most resembles the eyewitness’ memory of the culprit relative to other members of the lineup (Wells & Seelau, 1995). In a sequential lineup members are presented one at a time followed by a witness decision after each face is viewed. This simple variant of the traditional lineup testing procedure reduces the likelihood of false identifications in those situations where the police do not have the perpetrator (Lindsay & Wells, 1985). In 1999, the United States Justice Department published guidelines which included recommendations for lineups and photo-spreads (see Wells, Small, Penrod, Malpass, Fulero, & Brimacombe, 1998). Although sequential testing is not one of the recommended rules, it features prominently in the guidelines. Moreover, a recent survey of eyewitness experts indicates that they believe that sequential testing reduces the likelihood of misidentifications (Kassin, Tubb, Hosch & Memon, 2001). Sequential testing is advocated because of its potential to reduce identifications of innocent suspects. There is one group that is especially vulnerable to false identifications of this kind and that is older adults (Memon & Bartlett, in press; Searcy, Bartlett & Memon, 1999; 2000; Searcy, Bartlett, Memon, & Swanson, 2001). The current research sets out to see if sequential lineups together with some simple pre-lineup questions (Dysart & Lindsay, 2001) can increase the accuracy of the identifications of older witnesses. ‘Normal’ aging results in qualitative changes in recognition memory performance. While hit rates remain fairly stable, false alarms have been found to increase with aging
especially where the foils are selected to physically or conceptually resemble the target faces (see Searcy, Bartlett & Memon, 1999 for a review of the literature). In an eyewitness identification context, older adults (ages 60 years and above) are more prone to making false choices whether it is the choice of a foil in a target-present lineup or a failure to correctly reject faces from a target absent lineup (Memon & Bartlett, in press; Searcy et al. 1999, 2000; 2001; Rose, Bull, & Vrij, 2001). For example, Searcy et al (1999) found older adults made more erroneous foil choices regardless of whether the target was present or absent. Older adults were also significantly less likely to make correct target choices but this effect was only observed for one of the two events used in the study. Searcy et al (1999) draw upon the dual process framework to explain the age related increases in false recognition. Dual process models of recognition memory postulate two independent retrieval processes: an ‘automatic’ familiarity process that requires minimal attentional resources and a ‘conscious’ effortful recollection process (Jacoby, 1999; Mandler, 1980). Several lines of evidence suggest that older adults are less efficient at consciously recollecting contextual details surrounding an event and as a result are prone to decisions based on context free ‘familiarity’ (Bartlett & Fulton, 1991; Jacoby, 1999; Jennings & Jacoby, 1997; Searcy et al, 1999, 2000, 2001). Older adults also make more source monitoring errors (see Spencer & Raz, 1995, for a review) especially when there is a similarity in the potential sources of memory (see Henkel, Johnson, & DeLeonardis, 1998, for examples). Finally older adults are more likely to encode gist-like as opposed to distinctive details (e.g Koutstaal & Schacter, 1997; Schacter, Norman, & Koutstaal, 1998; Tun, Wingfield, Rosen, & Blanchard, 1998). This is also consistent with an increase in errors in lineup situations (where the foils resemble one another) - an effect that may not be alleviated by changing the mode of testing.
In considering whether or not sequential lineups will benefit older witnesses, it is necessary to consider how sequential lineups work. A witness presented with a lineup of faces will inevitably compare the faces with one another. This relative judgement strategy is more error prone than one where a witness compares each lineup member with his/her memory of the perpetrator and then uses some type of criterion threshold in order to decide whether the person is actually the culprit (Lindsay & Wells, 1985). It is believed that sequential lineups facilitate accurate face recognition through the use of an absolute judgement strategy (e.g. Lindsay, Lea, & Fulford, 1991; Dysart & Lindsay, 2001, Kneller, Memon, & Stevenage, 2001). More recently, it has been suggested that witnesses employ an absolute judgement in both sequential and simultaneous procedures but set a higher criterion match between their recollection of the culprit and the faces in the sequential lineup (Ebbesen & Flowe, 2002). This suggests that sequential testing may work by shifting criterion. Thus one way in which sequential test conditions may aid older adults, is by forcing them to use a strategy which makes them adopt a relatively strict (yes/no) decision to each face. Hence older adults may not simply rely on familiarity in making their judgements but take into account other types of information such as contextual details. Prior studies have shown that procedures which encourage older adults to adopt relatively strict decision criterion can reduce age differences in eyewitness performance (e.g. Multhaup, Leonardis, & Johnson, 1999; Memon, Hope, & Bull, 2001). However, the fact that age differences remain even under these conditions suggests that sequential testing will not eliminate age related false choosing by a shift in decision criterion alone.

The literature on aging and inhibition deficits suggests that older adults may fare worse in sequential test conditions. Age-related deficits in cognitive performance may arise from a decreased efficiency in the ability to inhibit information that is partially active but
irrelevant to task demands (Hasher, Stoltzfus, Zacks, & Rypma, 1991; Park, 2000). For example, older adults are more susceptible to distraction from irrelevant information (Connelly, Hasher, & Zacks, 1991) and tend to retain irrelevant information in memory (Hamm & Hasher, 1992). If age related increases in false choosing reflect this kind of deficit they will not be able to inhibit responses to a familiar face. This result will be a false positive response to a moderately familiar face in both simultaneous and sequential conditions. Under simultaneous test conditions, an inhibition problem will hurt older witnesses primarily in the target absent (TA) condition where there is a risk of an innocent person being identified. This effect may be exaggerated in sequential conditions. In the target present (TP) condition assuming the most familiar face is the target, we would not expect age differencesii. We have some data to support the hypothesis that there are no age differences in target choices (Searcy et al, 1999, Lineup 1; Memon et al, 2001). The inhibition hypothesis leads us to a somewhat different prediction for young and older witnesses under sequential conditions. Older witnesses may not be able to inhibit a response to a familiar foil that precedes the actual target face in sequential test conditions. This may increase foil choices and reduce the probability that the target will be picked by the older witnesses. Note that in a sequential lineup, the witness is under strict instructions that they can only make one choice and cannot go back on their decision. Thus older adults may fare worse in sequential target present conditions. In sequential target absent conditions, a deficit in inhibition may result in false choices but a stricter response criterion should result in a lower proportion of false choices relative to simultaneous conditions. Again the prediction is a reduction in false choosing under sequential target absent conditions but not an elimination of age effects.

Pre-lineup questions
A new procedure found to reduce false choices is the administration of three questions prior to the identification task. Dysart and Lindsay (2001) devised a pre-lineup memory questionnaire with the aim of reducing false identifications in target absent situations under simultaneous testing. Participants in the Dysart and Lindsay study viewed a crime simulation and were then asked for a description of the perpetrator prior to an identification from one of the following lineup types: simultaneous TP, simultaneous TA or sequential TA. Prior to the lineup, participants in the pre-lineup questionnaire condition were asked three questions; (1) “How clear a memory do you have for the face of criminal?” (2) “How confident are you that you will be able to select the criminal if you see a photograph of him in a lineup”, and (3) “How confident are you that you will realise that the guilty person is not in the lineup if you are shown a lineup with only innocent people in it?”. Participants recorded their answer to each question using a seven point Likert scale. Dysart and Lindsay found that the pre-lineup questions did not influence correct identifications from the simultaneous-TP lineup. However, correct rejections in the simultaneous-TA condition were higher for participants in the questionnaire condition. The questionnaire had no effect on the accuracy rates of participants in the sequential TA condition.

How do pre-lineup questions alter participants’ decision strategies? Dysart and Lindsay (2001) suggest that perhaps Question 3 (asking participants whether they would be able to reject the lineup in the absence of the criminal) made them more cautious and encouraged them to consider each photograph in succession before reaching a decision. The absence of an effect of pre-lineup questions on sequential lineup performance is cited as support for this. A more plausible explanation also considered by Dysart and Lindsay is that Question 3 altered demand characteristics, reducing willingness to choose. The current research will attempt a replication of the Dysart and Lindsay study. It will also extend their
work by using the pre-lineup questionnaire with older adults in an attempt to find a technique to reduce age-related false choosing.

Method

Participants

A total of 240 participants were tested individually. Of these, 120 were students from the University of Aberdeen (18–30 years; $M=20$; $SD=2.62$), participating in return for course-credit. The 120 older adults (60–80 years; $M=69.2$; $SD=5.88$) were healthy active volunteers recruited from the local community. They were paid for contributing to the study. Older participants underwent the Memory Impairment Screen (MIS) (Buschke, Kuslansky, Katz, Stewart, Sliwinsky, Eckholdt, & Lipton, 1999). This is a screening tool designed to identify individuals who should be considered for further evaluation for possible Alzheimer’s disease or other forms of dementia. A cut off score of 4 or less suggests impairment and warrants appropriate diagnostic assessment. The mean score in the current study was 7.77 (Range = 5 to 8). Thus no older participants were excluded.

Design

A 2 (age group) × 2 (lineup type) × 2 (pre-lineup questions) × 2 (lineup test mode) between-subject design was used to examine the effects of age of participant (young/old), type of lineup (whether or not the target is present or absent) pre-lineup questions and mode of test (sequential or simultaneous) on identification accuracy.

Materials

Event. A video clip of a theft from an office (1 minute, 30 seconds in length) was shown to each participant with an exposure to the target’s face (full-face and profile) of 60 seconds.
**Lineup.** The sequential lineup consisted of six colour photos (29.7 × 21.0 cms) arranged in a booklet. To prevent any comparison between the photographs being made, each photograph was separated by a piece of blank card. Thus no two photographs could be seen at the same time. Extra pieces of card were included after the final photograph so that participants were not able to guess how many photos there were in total in the booklet. The target appeared in position 4. The five distracters/foils were matched to an independent description of the target generated during pilot testing. The target was a female aged 27 years and the foils were all in the same age range (23-28 years). All photos were frontal shots of head and shoulders only.

The simultaneous lineup employed the same photographs as the sequential lineup. These were organised in a 3 × 2 array and remained covered until the participants had been given the standard lineup instructions. Two versions of the simultaneous and sequential lineup were prepared, one in which the target was present and another in which the target was replaced with a foil (target absent). In both conditions (sequential and simultaneous) participants were warned that the target may or may not be present in the lineup.

**Pre-Lineup Questionnaire.** A pre-lineup questionnaire was given to half of the participants in each age group. This consisted of the following three questions taken from Dysart and Lindsay (2001): (1) “How clear a memory do you have for the face of the girl in the video?” (2) “How confident are you that you will be able to select the girl if you see a photograph of her in a lineup”, and (3) “How confident are you that you will realise that the girl is not in the lineup if you are shown a lineup without her in it?”. Participants recorded their answer to each question using a seven point Likert scale, where for Question 1, ratings ranged from 1 (not at all clear) to 7 (extremely clear), and for Question 2 and 3, ratings ranged from 1 (not at all confident) to 7 (extremely confident).
Procedure

All participants were instructed to wear their corrective lenses where appropriate and to ensure they could see/read clearly at all times. Participants were then informed that they would be viewing a video recording and instructed to watch carefully. After watching the recording, participants went on to complete a number of unrelated filler tasks. These tasks took at least 60 minutes to complete thereby allowing a delay between witnessing the event and the lineup task. Some participants were given the three pre-lineup questions while others proceeded straight through to the lineup task. Participants were allocated to one of four experimental conditions and viewed a sequential or a simultaneous target-present or target-absent lineup. All participants were told that the target may or may not be among the photographs seen. The sequential lineup instructions were as follows:

I am now going to show you some photos, and would like you to tell me if the girl you saw in the video is among them. The photos will be presented in a booklet so that only one photo at a time can be seen. For each photo that you see I will ask you whether you think it is, or is not, the girl you saw. If you do not think it is the same girl then you can turn the page and look at the next photograph. Once you have turned the page, however, you cannot turn back to review earlier photographs. If you do think it is the same girl then you must tell me and I will record your decision. No further photographs will be shown once you have made this decision. The person you are looking for may or may not be there, so please do not choose a face unless you are confident that it belongs to the person you saw.
Participants taking part in the simultaneous lineup condition were able to view all of the photographs at the same time. They received the same cautionary lineup instruction as participants in the sequential condition.

Results

Chi-square analysis indicated significant differences in lineup accuracy as a function of lineup type (target present or absent) \( \chi^2 (1, N=240)=8.25, p<.01 \), with more 'incorrect responses' in the TP condition (.58) as compared to the TA condition (.42). Given that the two lineups yield different accuracy measures, separate analyses are performed for each type of lineup (TP and TA).

TP data
Hierarchical Loglinear (HILOG) analysis of the TP lineup was conducted to examine the effects of age, lineup test mode (sequential/simultaneous) and prelineup questions on lineup responses (hits, misses and false alarms). Pre-lineup questions had no significant effect on lineup choices. The only variables contributing to the final model were age, lineup type and lineup responses \( \chi^2 (12, N=120)=8.47, p=.75 \). Therefore the interactions nested under these variables were examined further. There was an effect of test mode on lineup responses \( \chi^2 (2, N=120)=20.43, p<.001 \) and a marginally significant interaction between age, test mode and lineup responses \( \chi^2 (2, N=120)=5.81, p=.05 \). Follow-up chi-square analyses indicated the sequential lineup was associated with significantly fewer hits as compared to the simultaneous lineup .19 versus .47, \( \chi^2 (1)= 18.04, p<.001 \). Following Wright (2002), the odds ratio (OR) statistic was used to measure the size of these effects. The odds of a hit under simultaneous testing for young and older adults was 4.37 and 3.61 respectively. Thus the odds of a hit are
just over 4 times more in simultaneous than sequential testing for young adults and over 3 times more for older adults. Sequential testing was also associated with significantly more misses than simultaneous testing, .59 versus .21, $\chi^2(1)= 8.34$, p<.01, OR (young)=13.12; OR (old)=2.14. The odds of a miss are 6 times more for young adults.

Lineup test mode had differential effects on the false alarm responses of young and older adults. As shown in Figure 1.1 and Table 1, sequential testing reduced the false alarm rate for younger participants (from .33 in simultaneous to .07 in sequential), $\chi^2(2)=19.56$, p<.001, OR=7.41 There were no differences for the older adults and if anything a tendency for sequential testing to increase the false alarm rate (.29 versus .38), $\chi^2(1)=5.32$, p=.07, OR =1.49.

Figure 1.1 & Table 1 here

TA data

HILOG of the TA data examined the same variables as above on the frequency of correct rejections and false alarms. Again prelineup questions did not contribute to the final model which had a generating class comprised of the variables age group, lineup test mode and accuracy $\chi^2 (9, N=120)=6.04$, p=.74. There was a significant effect of age on accuracy $\chi^2 (1, N=120)=18.34$, p<.01 and lineup test mode on accuracy $\chi^2 (1, N=120)=32.13$, p<.001. Follow-up chi-square analyses indicated that younger adults made twice as many correct rejections (see Figure 1.2) as compared to older adults $\chi^2 (1)=4.57$, 13.34, p<.01. Participants (young and old) made significantly more correct rejections under sequential test conditions $\chi^2 (1)=26.12$, p<.001. The OR for young and older adults were 10.34 and 13.63 respectively.
To summarise, the data suggest a different pattern under target present and absent conditions. When the target is present then simultaneous lineups are more likely to result in the correct identification of the target and there are no age differences. When the target is absent, older adults are significantly more likely to falsely identify a foil. However, sequential testing promotes more correct rejections among young and older adults when the target is absent. In target present situations, sequential testing lowers the choosing rates of both younger and older adults such that they are more likely to miss the target when present. There is also a tendency for sequential testing to increase false identifications among older adults.

Discussion

One of the primary aims of the current study was to determine whether sequential testing or pre-lineup questions would reduce age related false choosing rates. Replicating earlier research, we obtained high false choosing rates in our older adults. The results showed that in comparison to the younger age group, older adults were more likely to make a false (or foil) identification for every lineup situation except the simultaneous target present condition, (where they are no different to the younger adults). An important new finding was that the sequential lineup benefited older adults in a target absent situation, where the false identification rate dropped from .90 to .40 (in the simultaneous and sequential target absent conditions respectively). No benefits were found for older adults in the sequential condition in a target present situation, in fact, false identification rates rose (non-significantly) from .29 to .38 in this condition. In earlier papers also, we found that the elevated choosing rate among seniors persisted even when specific procedures were employed to reduce it (Searcy et al.,...
2001, Memon et al., 2001). Given that senior witnesses are prone to making false choices, the dramatic reduction in the probability that an innocent person will be identified in a sequential target-absent situation is a notable finding. The results also suggest sequential testing may be forcing witnesses to adopt a stricter criterion. However, as we anticipated, age differences are not eliminated. The story is quite different when the target is present. In the latter case, there are no age differences in correct identifications under simultaneous testing but sequential testing may actually hurt the performance of older adults (and to a lesser extent) younger adults. Most notable was a drop in correct identifications in both groups and a tendency for older adults to make more foil choices under sequential testing. We will consider each of these findings focusing firstly on the performance of older witnesses and then addressing the lowered choosing rates with sequential testing seen in both age groups.

In target present situations, age effects are inconsistent. With simultaneous testing, some studies report an age related reduction in hit rate in target present situations (e.g. Searcy et al., 2001, Searcy et al., 1999: Lineup 3) and others find no age differences (Searcy et al, 1999, Lineup 1; Memon et al., 2001). In our earlier work (using simultaneous lineups) we have argued that heuristic strategies such as ‘familiarity’ and ‘availability’ (Tversky & Kahneman, 1973) are effective in securing correct identifications when the target is present (Searcy et al, 2001). These strategies may have a different effect in target absent situations where you see a clear age related increase in false choices (Searcy et al., 2000). The picture may be quite different with sequential lineups. If age differences reflect the decreased efficiency of inhibitory mechanisms (Hasher et al, 1991) then older adults may find it more difficult to ignore ‘familiar’ foils when asked to make an absolute decision for each face. In the current study, our target was in position four so there were three foils preceding the target. The proportions (and frequencies) of witnesses choosing one of these three foils was .22 (13)
and .12 (7) for young and old respectively. While this is a post-hoc observation and the frequencies are rather small, we have obtained a reliable age difference in a study recently completed in our laboratory. In this study, the target also appeared in position 4 and the corresponding proportions were .09 (9) and .31 (25) for young and old respectively (Memon & Gabbert, 2002). Thus position of the target may be critical in determining the effects of sequential testing. We decided to hold target position constant in the current study for this very reason. The later the target appears in the sequential lineup sequence, the more likely it is that a response to an earlier familiar foil is not inhibited. In practical terms, this means that if the police run a sequential lineup and the culprit appears in a later position, he or she is less likely to be chosen than with a simultaneous presentation. Given that we did not systematically test for the effects of target position, our conclusions need to be verified with further research. Target position could interact with a number of different variables such as similarity of foils to the target, lineup instructions, quality of encoding of the face as well as witness characteristics.

Given that sequential testing does not eliminate age differences in false choosing, what alternatives can we suggest? One approach may be to use specific instructions to encourage older adults to adopt a stricter response criterion. For example, to use more diagnostic types of evidence such as the source of their memory on which to base their decisions. Prior studies have attempted to do this by using various types of cautionary instructions (e.g. Multhaup, 1995; Memon et al., 2001). However, while these instructions reduce age differences, they do not eliminate them. It may be that instructions and procedures cannot completely combat the changes in cognitive functioning that accompany aging (see Park, 2000 for a review).

A final problem that remains to be addressed concerns the consequences of a lowered
choosing rate on correct identification rates in both age groups. Our data suggests that when the target *is* present, the sequential lineup reduces hit rates by more than half (see Table 1). A review of published studies where simultaneous and sequential lineup performance is directly compared, reveals that sequential TP lineups sometimes produce lower hit rates (see Table 2) and larger miss rates (see Lindsay, Lea, & Fulford, 1991; Lindsay, Pozzulo, Craig, Lee, & Corber, 1997, Experiment 2; Lindsay & Wells, 1985; Memon & Bartlett, in press; Parker & Ryan, 1993; Sporer, 1993). These differences between performance on simultaneous and sequential lineups might not always reach statistical significance. However, the lower choosing rates produced by the sequential lineup procedure are notable.

Table 2 here

In an earlier study (Dysart & Lindsay, 2001) pre-lineup questions significantly increased correct rejections in TA simultaneous lineups. This result was not replicated here although there was a trend in the data suggesting that under TP conditions, pre-lineup questions reduce false alarms. If we look carefully at the pre-lineup questions, two of the three questions are asking participants to estimate how confident they are about the decision they are about to make including how confident there are they could reject the lineup. However, past research has shown that efforts to increase participants introspective tendencies do not affect identification accuracy (for example the work of Kassin, Rigby, & Castillo, 1991, on the retrospective self-awareness effect).

There is no doubt that eyewitness identification errors can result in conviction of innocent people (e.g. DNA exoneration evidence, Scheck, Neufeld, & Dwyer, 2000). Researchers have argued in the past that foil identifications are inconsequential in target
present situations because foils are innocent fillers (e.g. Corey, Malpass, & McQuiston, 1999). We disagree with this because a foil identification means a failure to identify the target, a behaviour that has important consequences in the real world. The police usually conduct a lineup later in the investigative process to seek confirmation that the person they have is the culprit (Gonzalez, Ellsworth, & Pembrooke, 1993). Eyewitness identification may be essential for prosecution to proceed (Gross, 1987). Moreover, there is some data to suggest that police lineups do contain culprits a large proportion of the time (Flowe, Ebbesen, Libuser, & Rienick, 2001; Flowe & Ebbesen, 2001). Thus foil identifications may stall the investigation or worse still mean that the guilty party goes free. It is, therefore, important to have a thorough understanding of how the sequential lineup works when the culprit is in the lineup. The current research has identified some shortcomings of the sequential testing procedure that researchers and practitioners should take note of. As with most interventions, there are some situations in which they are more effective than others. There is no doubt that the sequential lineup reduces the probability of an innocent person being identified from a lineup. If, however, the genuine perpetrator is in a lineup then sequential lineups may, under some situations, reduce the probability of a correct identification.

References


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Table 1

Table showing Proportion of Accurate and Inaccurate responses (TP/TA) by Age and Lineup Test Mode

<table>
<thead>
<tr>
<th>Condition</th>
<th>Young</th>
<th>Older</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Simultaneous</td>
<td>Sequential</td>
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<tr>
<td>TP Hit</td>
<td>0.47 0.17</td>
<td>0.48 0.21</td>
</tr>
<tr>
<td>Miss</td>
<td>0.20 0.77</td>
<td>0.23 0.41</td>
</tr>
<tr>
<td>False Alarm</td>
<td>0.33 0.07</td>
<td>0.29 0.38</td>
</tr>
<tr>
<td>TA Correct Rej</td>
<td>0.47 0.90</td>
<td>0.10 0.60</td>
</tr>
<tr>
<td>False Id.</td>
<td>0.53 0.10</td>
<td>0.90 0.40</td>
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</tbody>
</table>
Figure Caption

*Figure 1.1 & 1.2.* Proportions of lineup choices made in a TP and TA lineup.
Figure 1.1

Target Present Lineup

<table>
<thead>
<tr>
<th></th>
<th>Simultaneous Lineup</th>
<th>Sequential Lineup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hit</td>
<td>0.47</td>
<td></td>
</tr>
<tr>
<td>Miss</td>
<td>0.21</td>
<td>0.59</td>
</tr>
<tr>
<td>False Alarm</td>
<td>0.31</td>
<td>0.22</td>
</tr>
</tbody>
</table>
Figure 1.2

Target Absent Lineup

- Simultaneous Lineup
- Sequential Lineup

Correct Rejection
- Simultaneous: 0.28
- Sequential: 0.72

False Alarm
- Simultaneous: 0.25
Table 2.

**Differences in Hit Rates in Target Present Simultaneous and Sequential Lineups in a sample of published eyewitness studies**

<table>
<thead>
<tr>
<th>Article</th>
<th>Hit Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Simultaneous</td>
</tr>
<tr>
<td>Kneller, Memon, &amp; Stevenage (2001)</td>
<td>.61</td>
</tr>
<tr>
<td>Lindsay, Lea, Nosworthy, Fulford, Hector, LeVan, &amp; Seabrook (1991, exp. 2)</td>
<td>.57</td>
</tr>
<tr>
<td>Lindsay, Lea, &amp; Fulford (1991)</td>
<td>.57</td>
</tr>
<tr>
<td>Lindsay, Pozzullo, Craig, Lee, &amp; Corber (1997, exp. 2)</td>
<td>.80</td>
</tr>
<tr>
<td>Lindsay &amp; Wells (1985)</td>
<td>.58</td>
</tr>
<tr>
<td>Memon &amp; Bartlett (in press) (overall results)</td>
<td>.35</td>
</tr>
<tr>
<td>Parker &amp; Ryan (1993)</td>
<td>.42</td>
</tr>
<tr>
<td>Sporer (1993)</td>
<td>.44</td>
</tr>
</tbody>
</table>

Footnotes

i In the Source Monitoring Framework, more stringent criteria refer to criteria involving more discriminating or diagnostic types of information, not simply greater levels of perceived familiarity as in signal detection theory.

ii This similarity of foils to the target may influence choosing rate in target present lineups however (see Wells, 1984 for a review). The absolute number of foils will also influence extent to which there is an increase in foil choices.

iii It has been suggested that decision criteria may change as the sequential lineup precedes. It doesn’t remain constant throughout the sequential lineup. A witness may set a high standard for the first face because they want to be sure that a face that has not as yet been seen is not a better match but they may lower their criterion as they precede through the lineup (Ebbesen & Flowe, 2002).