Policy Regarding the Sequential Lineup is not Informed by Probative Value but is Informed by ROC Analysis

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Wells writes: "For eyewitness identification evidence, probative value is reflected in likelihood ratios or probabilities that an identification of the defendant being offered at trial was accurate or mistaken." Figure 1 presents hypothetical ROC data showing the full range of correct and false ID rates associated with a simultaneous lineup and, separately, a sequential lineup. Next to each ROC point is a common measure of probative value. When Wells refers to probative value, he is referring only to the rightmost ROC point for each procedure. In Figure 1, the probative value of the rightmost ROC point is higher for the sequential lineup (7.4) than for the simultaneous lineup (6.9). Wells argues that a result like this means that an ID made using the sequential procedure is more trustworthy than one made using the simultaneous procedure. *But this conclusion applies only to situations in which confidence is ignored*. Wells ignores confidence, but courts of law do not, and neither should researchers who want to determine which lineup procedure is associated with more trustworthy identifications.

Just as a higher (i.e., more conservative) criterion may be used in a court of law by attaching less weight to low-confidence IDs, one can do the same with data collected in the laboratory. The use of a slightly more conservative criterion, which is achieved by treating the lowest-confidence IDs as effective non-IDs, generates the next point to the left on the ROC. For both procedures, this new ROC point is associated with a higher probative value than its neighbor to the right. The use of an ever more conservative criterion generates additional points to the left on the ROC, each associated with a higher probative value than the last. It is not known which ROC point is the most relevant to a court of law, nor which probative value, but it seems certain that the rightmost point (which includes low-confidence IDs) is the least relevant.

Instead of using a measure of probative value to identify the best lineup procedure, one should ask which lineup procedure is better able to discriminate between innocent and guilty

suspects. Using *d′* to measure discriminability is conceptually the right approach, but, in the case of lineups, that measure is directly tied to questionable and untested theoretical assumptions. ROC analysis measures discriminability without recourse to theory, which is why it has long been used in medicine to measure how well a diagnostic test discriminates between the presence vs. absence of a disease.

When Wells writes "Gronlund et al. (2013) are correct that ROC analyses are the best way to determine if the simultaneous/sequential difference is a criterion shift," he misses the main point of our article. The most important function of ROC analysis is to identify the procedure that yields *higher discriminability*. Just as we have illustrated in Figure 1, the first three published studies using ROC analysis found that simultaneous lineups yield significantly higher discriminability than sequential lineups (Dobolyi & Dodson, in press; Gronlund et al., 2012; Mickes et al., 2012). If that turns out to be the final story, it would mean that any probative-value gain that might be achieved from the conservative criterion induced by a sequential lineup can be exceeded by using a suitably conservative criterion in conjunction with a simultaneous lineup[1]. That approach maximizes discriminability, which is the only way to simultaneously reduce *both* errors to which Wells refers—mistaken identifications of the innocent and non-identifications of the guilty.

Footnote

[1]In actual criminal cases, the confidence rating used to establish an acceptable criterion would be the one that was made at the time of the initial identification, not the one made later during a trial (Technical Working Group for Eyewitness Evidence, 1999).

References

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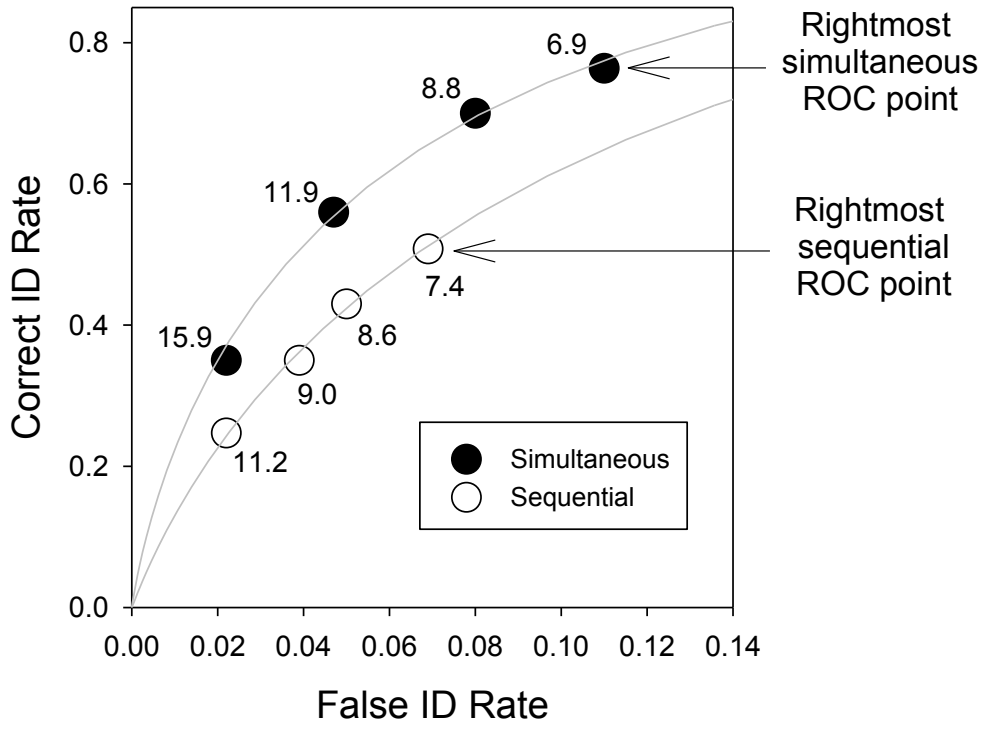

Figure 1. Hypothetical simultaneous and sequential ROCs, with probative values (correct ID rate / false ID rate) indicated next to each data point. The rightmost ROC point represents the overall correct and false ID rates that are typically analyzed in an eyewitness memory study.