

Title: Prioritizing quality: investigating the influence of image quality on forensic facial comparison

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Supplementary Information

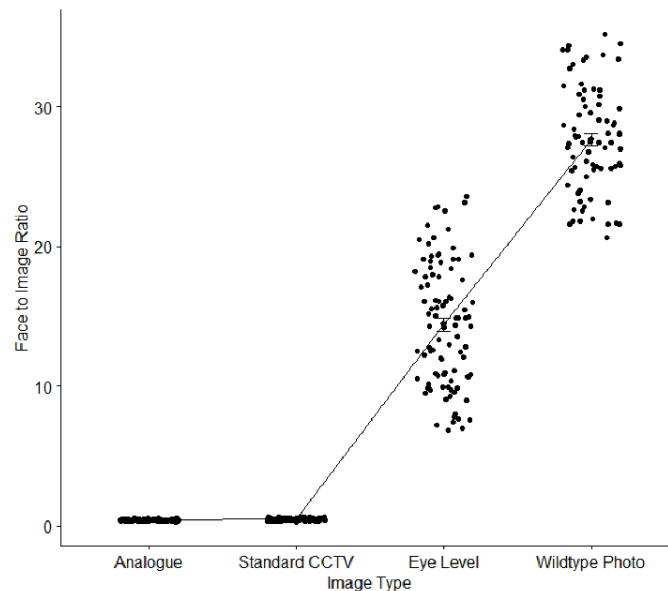


Fig. 1 Scatter plot with randomized jitter points and mean error bars of face-to-image pixel proportion by imaging modality. Significant differences are seen between all image types, each subsequent modality having a much greater number of pixels of the image that made up part of the face

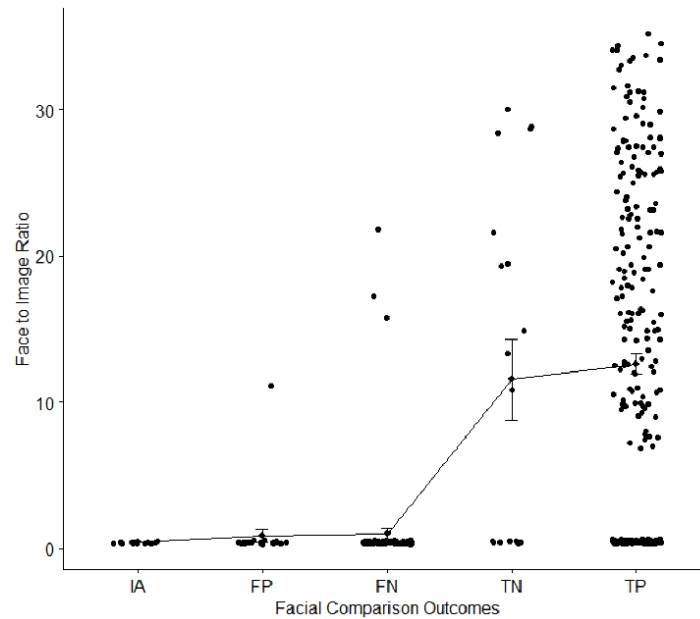


Fig. 2 Scatter plot with randomized jitter points and mean error bars of face-to-image pixel proportion by comparison outcome. Significant differences are seen between true positive (TP) and true negative (TN) outcomes, and the other three outcomes, which were generally related to lower face-to-image pixel proportion. Key: IA= Inconclusive Analysis; FP= False Positive; FN= False Negative; TN= True Negative; TP= True Positive

Table 1 Pairwise comparisons using Wilcoxon rank sum test with Bonferroni continuity correction between comparison outcomes and underexposed greyscale pixel value bins

	False Negative	False Positive	Inconclusive Analysis	True Negative
False Positive	< 0.001*	-	-	-
Inconclusive analysis	1.000	0.005*	-	-
True Negative	0.002*	1.000	0.045*	-
True Positive	< 0.001*	0.064	< 0.001*	1.000

* These values indicate significant differences between two comparison outcomes.

Table 2 Pairwise comparisons using Wilcoxon rank sum test with Bonferroni continuity correction between comparison outcomes and overexposed greyscale pixel value bins

	False Negative	False Positive	Inconclusive Analysis	True Negative
False Positive	1.000	-	-	-
Inconclusive analysis	0.718	1.000	-	-
True Negative	0.002*	0.020*	0.005*	-
True Positive	< 0.001*	< 0.001*	= 0.001*	1.000

* These values indicate significant differences between two comparison outcomes.

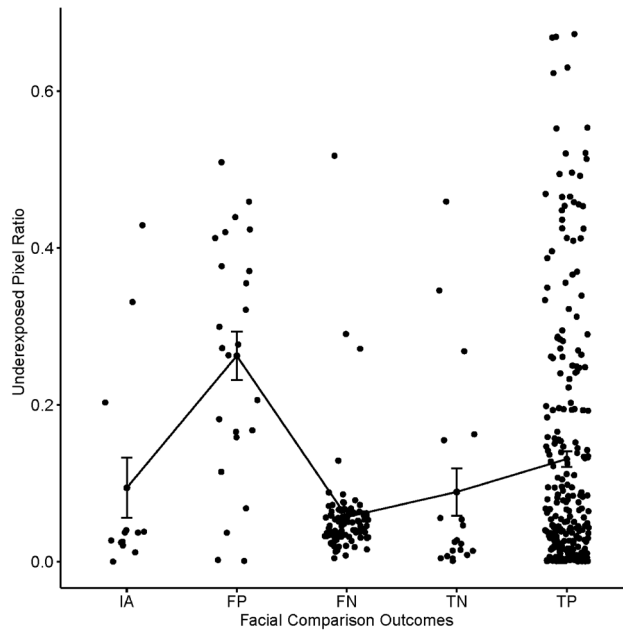


Fig. 3 Scatter plot with randomized jitter points and mean error bars of underexposed pixel proportion by comparison outcome. Significant differences are seen between false positive (FP) and all other outcomes as an increase of underexposed pixels in false positives. Key: IA= Inconclusive Analysis; FP= False Positive; FN= False Negative; TN= True Negative; TP= True Positive

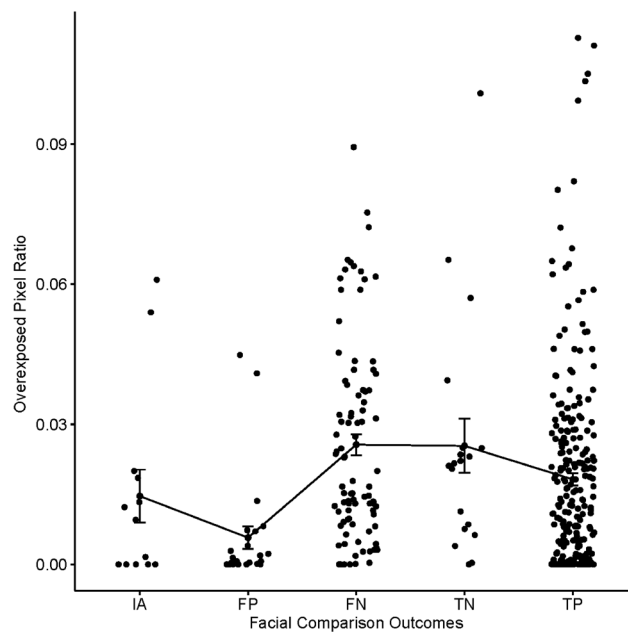


Fig. 4 Scatter plot with randomized jitter points and mean error bars of overexposed pixel ratio by comparison outcome. Significant differences are seen between false positive (FP), inconclusive analyses (IA) and true outcomes (TP and TN). This is evident with the lower ratio of overexposed pixels in FP outcomes compared to FN, TN, and TP. In addition, FP outcomes had a significantly lower ratio of overexposed pixels than TP outcomes. Key: IA= Inconclusive Analysis; FP= False Positive; FN= False Negative; TN= True Negative; TP= True Positive

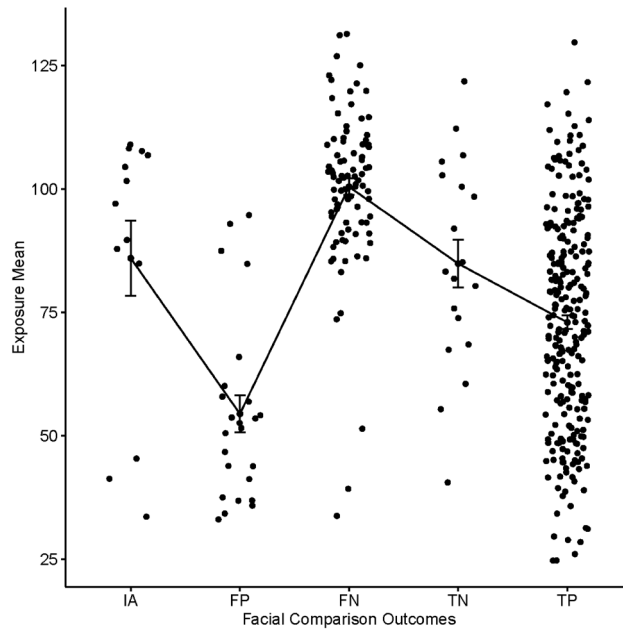


Fig. 5 Scatter plot with randomized jitter points and mean error bars of exposure mean by comparison outcome. Significant differences are seen between true positives (TP) and negative (TN), and false positives (FP) and negatives (FN), as well as between false positives and negatives. Inconclusive analyses (IA) had significantly higher mean greyscale values than false positives. FN outcomes tended to have higher mean greyscale values than FP, TN, and TP outcomes, while FP tended to have lower mean greyscale values than IA, FN, TP, and TN. Key: IA= Inconclusive Analysis; FP= False Positive; FN= False Negative; TN= True Negative; TP= True Positive

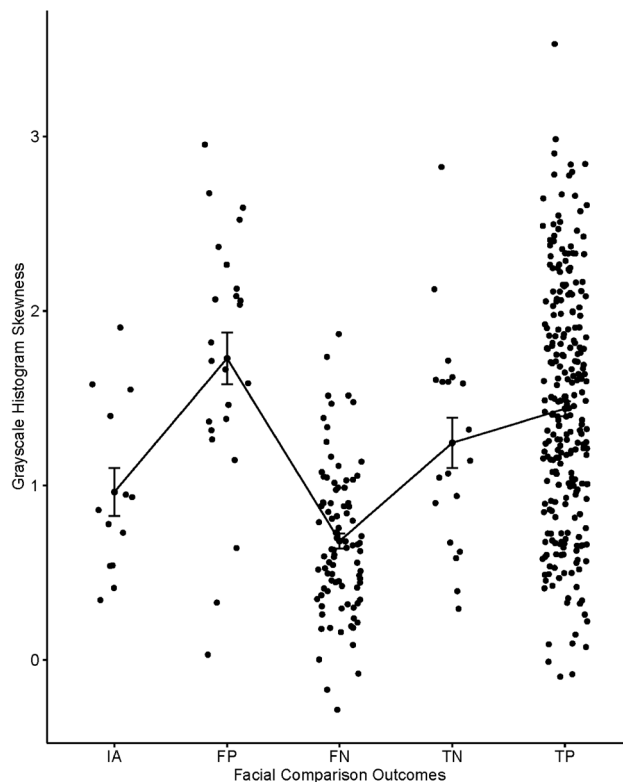


Fig. 6 Scatter plot with randomized jitter points and mean error bars of grayscale histogram skewness by comparison outcome. Significant differences are seen between false negatives (FN) and other outcomes excluding inconclusive analyses (IA). False negative outcomes were associated with a less skewed histogram, over other outcomes (excluding inconclusive analyses). Key: IA= Inconclusive Analysis; FP= False Positive; FN= False Negative; TN= True Negative; TP= True Positive