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Dynamic Signature Verification and Forgery

C.R. Blomeke, J.R. Padfield, C. J. Bane, S.J. Elliott, Ph.D

Biometrics Performance, Standards, and Assurance Laboratory

Objective:

- Define a 9 level scale of forgery training
- Determine if there is a statistically significant difference among the variables across levels 2 - 9 of training

Methodology:

- A group of 25 volunteers were trained at Level 1 and then instructed to attempt the forgery
- The same group of volunteers would move to the next training level, complete the training, and attempt the next forgery
- The forgery attempts were then compared to a set of 25 genuine signatures

Results

- A general increase in forgery quality did not result across the levels of increased training
- Some variables were progressively worse with additional training.
- Speed and total distance traveled by the pen were 2 factors that made a forgery easily detectable when the genuine signature was traced
- Some subjects had considerable variation of speed across the levels of training.

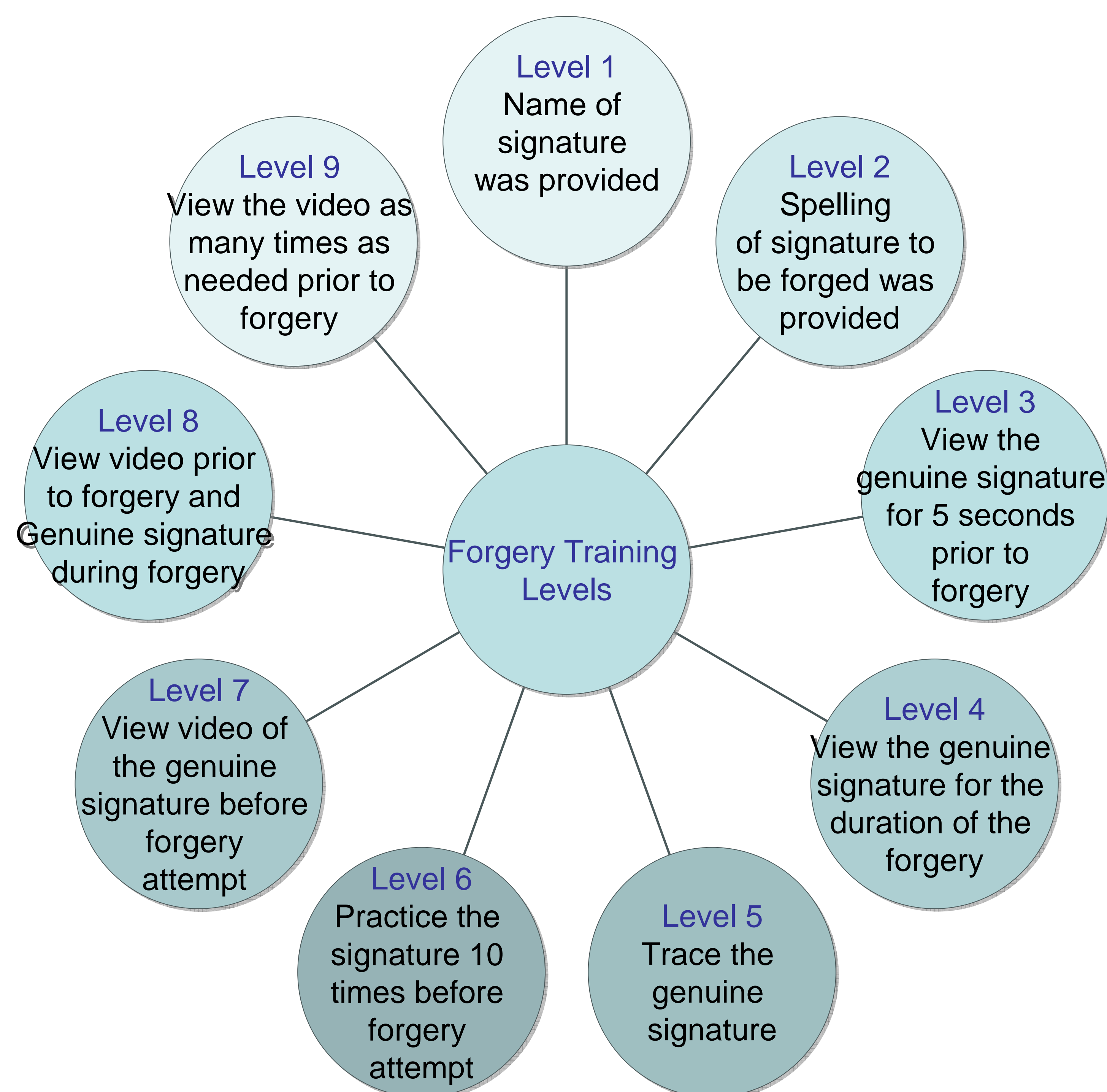


Figure 1- Diagram of the forgery training levels

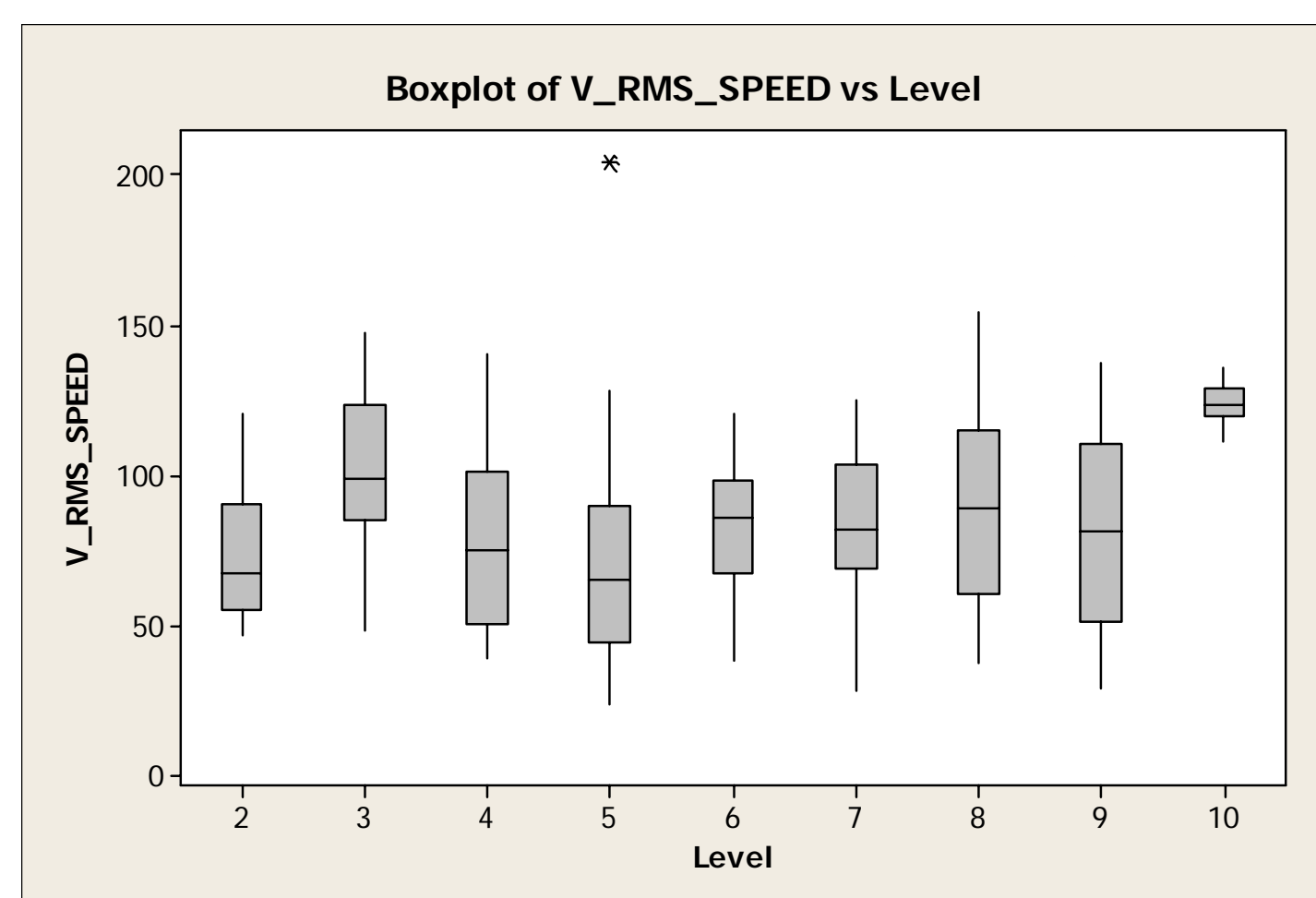
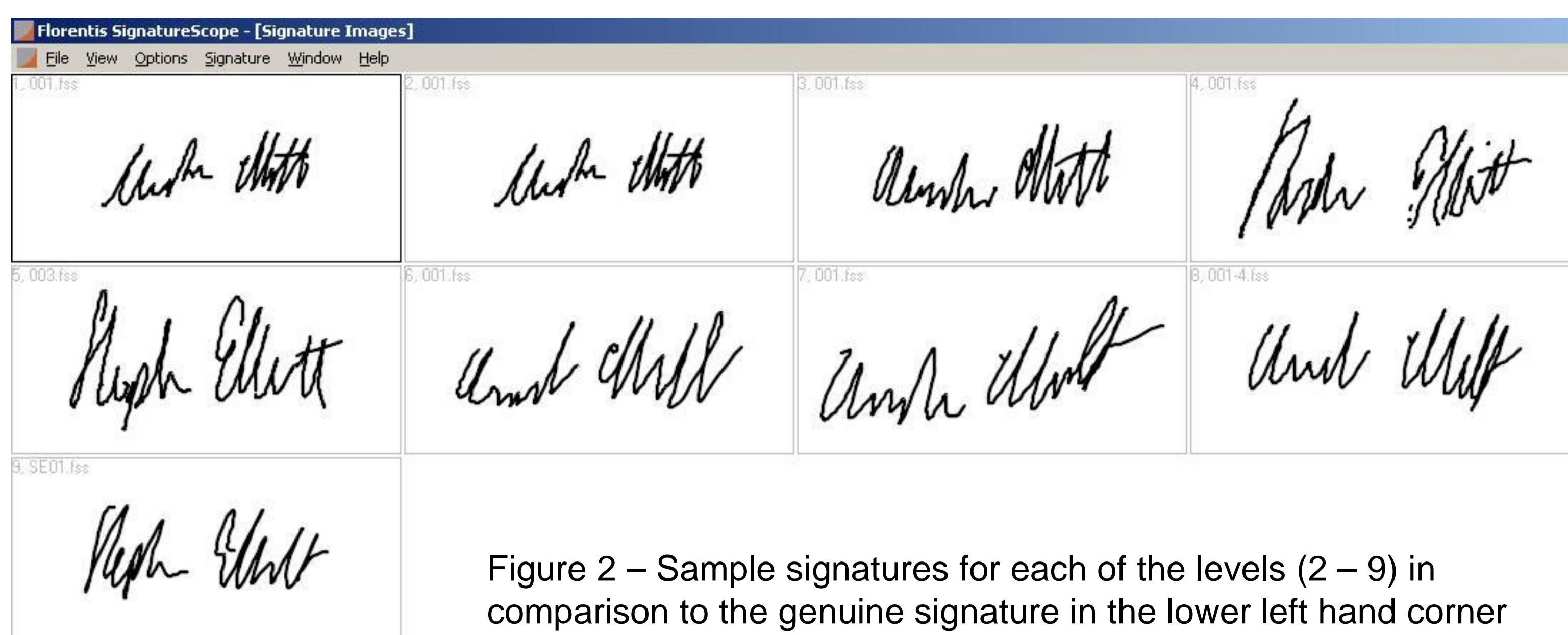


Figure 3 – A boxplot showing the difference in variation of the forgeries at each level (2 – 9) versus the genuine signer (level 10) for the speed of the signature.

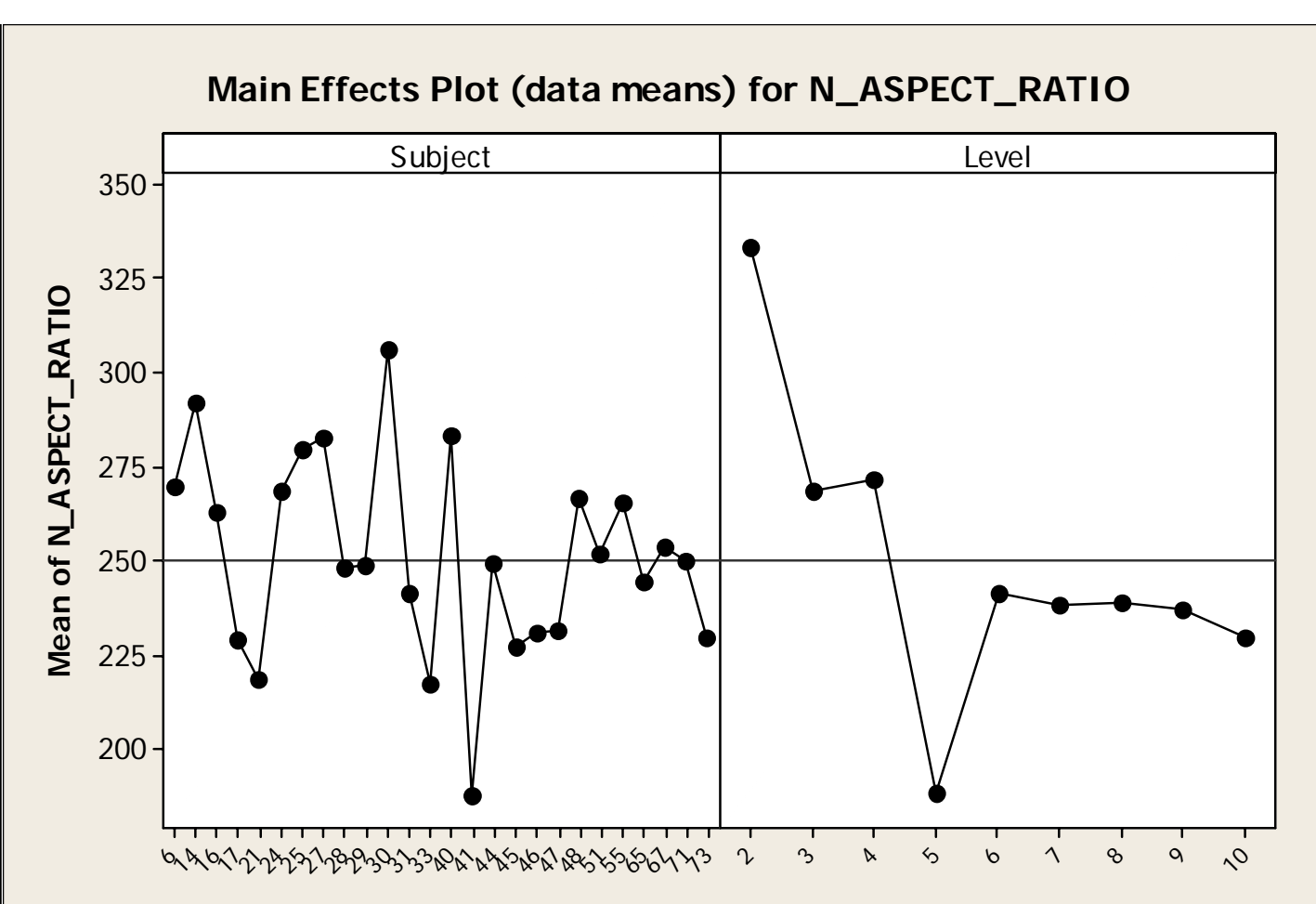


Figure 4 – A plot of the mean value of the aspect ratio (width to height) of the signature by subject and level. Subject 73 and level 10 correspond to the genuine signer.

Conclusions:

- The lack of increasing similarity of forgery attempts and the genuine signature over the levels suggest that a forger that is coached by an authentic signer is no more likely to succeed at forging the signature than someone who has only seen the name printed on a business card.
- Forgers were able to mimic the genuine signature for 14 of the measured variables at Level 3, the most of any level.
- Additional work should be done to increase the sample size of forgers, and to also increase the number of forgery samples created at each level to determine a normal range of variation for each subject, and get a better idea of the variation due to training.
- The pen speed and total pen distance traveled are 2 variables that would be useful in an algorithm for detecting tracings of genuine signatures.