

Fig. 3. (a) A drawing figure based on the measured outline of a real necktie showing the portions used for 8 times folds with solid lines indicating mountain folds. (b) A plot of difference in the length of tails after tying against that before that including the portion used for 8 times folds.

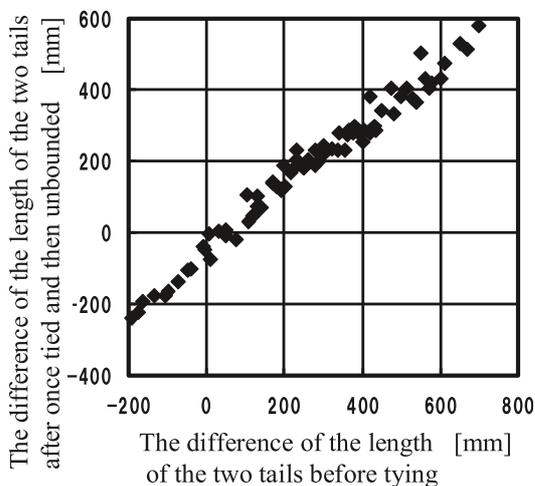


Fig. 4. Relation between the differences of length of the two tails of a tie dangling from the neck before tying and after unbounding of once tied knot.

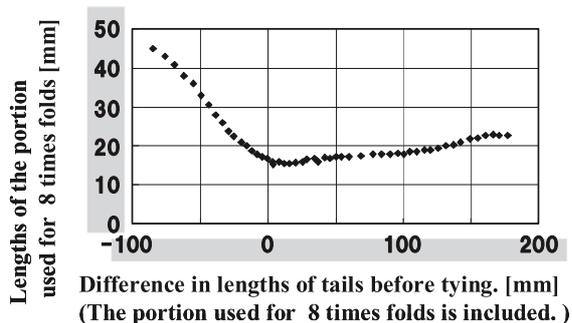


Fig. 5. Dependence of the length of the portion used for 8 times folds on the position to start the folding.

as Fig. 7 giving a sense of nonlinearity in everyday tying procedure.

Addendum

In Fig. 2, the three lines for mountain fold have different inclination angles from those of the other fives, and the re-

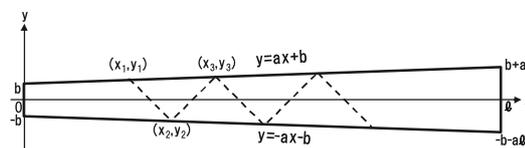


Fig. 6. A stripe with its width start with $2b$ at the left end and increase with the longitudinal length ℓ at the rate of a .

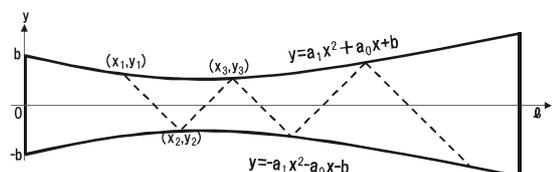


Fig. 7. A stripe with its width start with $2b$ at the left end and change with the longitudinal length ℓ in a quadratic manner.

duction of the two lengths of the sevens between the eight lines during the actual tying is limited by the length around the neck. Here, neglecting these factors, the model was simplified without losing the essential features of the process. Including these factors, it is obviously possible to mark a point on a tie as a function of a length around the neck by extending the analysis described here, which may ease getting a good balance of the lengths of two tails of the tie in tying. However, it is rather out of scope of this paper which tries to point out the sense of “non-linearity” in our daily life in reference to the typical drift of the argument on linearity and non-linearity including the Malthus equation and the logistic equation.

References

Fink, T. M. and Mao, Y. (1999) Design-ing tie knots by random walks, *Nature*, **398**(4 March), 31–32.
 Fink, T. M. and Mao, Y. (2001) *The 85 Ways to Tie a Tie*, Fourth Estate, HarperCollins Publishers, London.