

„Handwriting Research. Validation & Quality”

A new book

by Yury Chernov & Marie Anne Nauer

The Zurich Institute for Handwriting Sciences has recently issued a book “Handwriting Research. Validation and Quality”. The book opens with a series of publications on handwriting research. The requirement for the valid scientific-based procedures of the analysis of handwriting has arisen with all related areas like forensic, psychology or medicine. This need is dictated by researchers and practitioners as well, since they often cannot agree about even such basic things as these disciplines which have been developed historically and many evaluation principles which were formulated long ago. Modern technologies allow the development of new methods of validation, and, thus, lead to new approaches to quality assurance. Since handwriting practice has been changing very quickly, it is required to have the methods that not only validate the traditional models, but also generate new ones.



Handwriting Research

Validation & Quality

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Look inside the book

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The intention of the current and future publications is to create a platform for researchers and practitioners, where they may publish their ideas, results and opinions on different aspects of handwriting. There is definitely a lack of such opportunities in existing peer-reviewed journals. We would like to create this possibility not only for the experienced researchers but as well for students who provide interesting studies. The second intention is to make this communication international and available for all interested people. That is why the publication is released in the English language and not just in German, which might be more typical for the handwriting topics in German speaking countries.

Besides the releasing of the book series, the Institute for Handwriting Sciences has established a periodic seminar. The seminar meetings take place in Zurich. They should offer an opportunity for face-to-face discussion of different topics and problems related to handwriting. Such professional discussions are aimed not only at information exchange, but also at finding a consensus on the topic and on the systemic structuring of the discussed problem. The seminar is a natural addition to the off- and on-line publications.

The subtitle of the current book is Validation & Quality, expressing the major subject of the published articles. The book includes four parts:

1. Handwriting Analysis: Scientific Status, Problems, Methods & Approaches, and Quality Assurance
2. Validation Studies in Handwriting Psychology
3. Quality Assurance in Forensic Handwriting Analysis
4. Handwriting as Brain Activity

In the first part readers find articles that enclose the theoretical and practical approaches and problems of the validation and quality assurance in handwriting analysis. In her article “How to Improve the Scientific Status of Handwriting Psychology? Psychometric and Methodical Aspects” Dr. Nicole Gruber (University of Regensburg, Germany) analyses the scientific status of handwriting research and lists four points that explain how this status should be improved. In particular she writes about the theoretical background, which leads back to psychodynamics, deep-psychoanalysis, and expressive psychology, and about the advantages of using a combination of inductive-deductive methods. In the practical part, the author speaks about the measurement and scaling of the handwriting signs and analyses in this context the holistic and analytical graphometric approaches. Speaking about the required quality of statistical validation studies, she touches in particular the correlation and regression analysis, power analysis, and some other aspects and pitfalls of the scientific handwriting research. At the end the author emphasizes the importance of replication and meta-analysis studies.

Dr. Christian Katz (SGG and Abakaba AG, Switzerland) in his article “The Practice of Handwriting Analysis and Phenomenological-interpreting Approach to the Validation” as well analyses the problems of the handwriting psychology. He points to the principle specifics of the method and emphasizes that not only statistical approach can be used for the validation, but as well the phenomenological interpretation and practical experience of multiple specialists.

The next article “Formal Validation of Handwriting Analysis” by Dr. Yury Chernov (Institute for Handwriting Sciences, Switzerland) brings the formalisation and pure formal statistical validation of the handwriting analyses to the foreground. Only this approach supported by the computer-aided procedures can check the standard requirements of objectivity, reliability and validity. The author considers the handwriting psychology as a psychometric method, which has its special attributes. The article includes the analysis of the known studies on validation of the handwriting analysis and points out their methodological problems. The proposed computer-aided model and procedure allows these problems to be solved. That is demonstrated on the results of several validation studies presented in the article.

The last article in the first part (“Ring Trials for Handwriting Analysis. An Instrument for Qualitative and Quantitative Method Validation”) presents a different approach to the validation and quality assurance. The author and founder of the Organisation for Handwriting Analysis & Interlab Proficiency Testing Claudia Caspers (Germany) explains how a good practice example from other academic disciplines like human medicine can contribute to the validation of the psycho-diagnostic method of handwriting analysis. The method needs a qualitative as well as a quantitative approach. Interlab proficiency tests, also known as ring trials, include both aspects and guarantee not only method validation but also quality assurance. As well as the theoretical background, this article already provides the first promising results of ring trials performed in 2016 and 2017.

The second part includes several validation studies done against different psychological tests. In “Regression and Variance Analysis of Big Five and Handwriting Psychology as a Valid Foreign Assessment of its Constructs” Dr. Stephan Toggweiler (ZHAW Zurich University of Applied Sciences, Switzerland) describes how based on the data from a big experiment and handwriting analysis software GraphoPro®, the Big Five factors were designed and validated. The factors were modelled with the help of the cluster analysis and demonstrated promising results when compared to the NEO-PI-R test. Based on the resulting outcomes, the author proposes that further replication studies should be done.

“Using Computerized Optometric Handwriting Analysis in Psychological Assessment. Computer Comparative Graphometry in the IPCH Research” by Dr. Dalibor Kučera (University of South Bohemia, Czech Republic) deals with the relationship between handwriting and selected personality characteristics using modern graphometric methods. He introduces the IPCH (Interpersonal Characteristics in Handwriting) research for the description of handwriting, computer comparative graphometry. The analysis consists of optometric processing of handwriting materials. Research findings point to various correlations between many personality characteristics and graphometric parameters. According to the author, the results suggest that the study of handwriting, as a source of psychologically relevant information, has a significant potential and may be of great interest for further academic research.

The authors of the next presented study “Neuroticism and Handwriting – Analysis Using Machine Learning Techniques” Dr. Zuzanna Górska-Kanabus (Cardinal Stefan Wyszyński University, Poland) and Dr. Artur Janicki (Warsaw University of Technology, Poland) investigated whether it is possible to train a machine to recognize low and medium neuroticism levels based on handwriting features. Machine learning techniques (LMT tree, Logistics, Naïve Bayes, RBF Network and SVM classifiers) were used to examine data from 801 people. The neuroticism level was measured by the Polish version of the NEO-Five Factor Inventory. The handwriting samples were described by 48 variables. The machine learning algorithms were trained and tested for each gender separately. The best results were achieved for the Logistic classifier and were slightly above 0.65. The results indicate that there may be a possibility to recognize neuroticism based on handwriting and machine learning techniques.

In “Integrative Assessment of Basic Human Values and Motivations by Means of Handwriting Psychology and PVQ-Test” the authors, Dr. Yury Chernov (Institute for Handwriting Sciences, Switzerland) et al. from Taras Shevchenko National University (Ukraine) present their study, the actual aim of which is to set an integrative procedure of evaluation of human values. The procedure includes the PVQ Test and the handwriting analysis in order to obtain more reliable conclusions, where both methods agree with each other, a result reached at least for five scales out of ten. The outcome of the presented experiment provides additionally data for the validation of the handwriting psychology, since the PVQ test itself is well validated and is a good reference.

In the third part readers can learn about forensic handwriting analysis. Dr. Angelika Seibt (Rottach-Egern, Germany) in “Measurement of General and Special Handwriting Signs in the Forensic Handwriting Examination” presents the very detailed and differentiated procedure of the collection and evaluation of the data on the handwriting samples. The general and individual handwriting signs, which are explained in the article, are measured at different scales – nominal, ordinal and metric. The basis of a forensic script examination are the observable findings as well as a defined set of rules for the evaluation of the findings. The presented procedure is the result of the rich practical experience of the author and serves as a necessary base for the quality assurance in forensic handwriting examination.

In “Past and Present in the Research on Handwriting: Time to Improve Reliability” Dr. Nicolò Di Toma (Centro Ricerche sulla Scrittura, Italy) follows the previous article and presents the topic of the reliability of the forensic handwriting examination by modern means. Especially he emphasizes the complexity of the reliable evaluation of dynamic aspects of the handwriting samples. Especially the usage of digitizers and corresponding software like Movalizer are important tools to develop the general study of handwriting from several points of view: neurological, forensic, educational, and more.

In the fourth part we present two articles devoted to the neurological aspects of writing as brain activity. The first one is an old, however, still very relevant work by Robert Saudek “The Central Nervous System and the Act of Writing”. It is surprising how at the very start of the scientific handwriting research, at the beginning of the 20th century, the very actual problems were formulated and the hypotheses relevant up to now were formulated. Robert Saudek explains them and demonstrates his view on the brain processes, which are actually close to the modern perception.

In “The Second System of Thought and its Trace in Handwriting” Dr. Marie Anne Nauer (Institute for Handwriting Sciences, Switzerland) points out that handwriting research, as a discipline of psychology, is a semiotic science and, as such, neither inductive nor deductive, but abductive or presumptive. Therefore, premises for any investigation have to be most carefully reflected and developed, and this very process is not only rational and logical, but, as well, much more holistic. According to the new PSI-model of Julius Kuhl, the author develops a possibility to better collate this type of thinking process, and she locates and retraces as well its theoretic precursor in the hypotheses of Pophal. This implies an irradiation of the role of emotions within our brain’s organisation and their expression and observations in handwriting, hence giving a new perspective of the psychology of thought comprehending neurological research, psychological experience, and the theory of the handwriting psychology.

We hope that the presented interesting ideas, concepts, and empirical applications of handwriting analysis will provide insight and enhance the readers’ understanding of this very special knowledge area.

“Handwriting offers ... the highly important advantage that, while other movements vanish as soon as they have been carried out, or can only be captured with sensitive instruments, it remains permanently fixed on the paper from its inception. When a person writes, then they are totally absorbed in their pen, and thus also in their hand, forming the instrument of communication, so that, if the word is the momentary revelation of thought, writing represents just as an immediate if not even faster transmission of the same.”

Cesare Lombroso
“Handbook of Graphology”, 1896

“Handwriting is a highly developed skill that we usually start to acquire during early childhood which then develops during the subsequent years through adolescence and early adulthood. By early adulthood handwriting has matured into a settled style that will remain largely unchanged for many years until such time as factors that are detrimental to handwriting production start to affect it, such as illness and old age.”

Michael Allen
“Foundations of forensic documentation analysis”, 2016

“There is a little doubt that in the adult, handwriting is an expression of highly adaptive learned programmed movement sequences. For one, the program itself can be transferred to different muscle groups (e.g. hand or foot). Second, the program can adapt to environment constrains. Third, there is support to demonstrate that certain features for handwriting, such as stroke duration and movement patterns, are somewhat constant despite variability of the task demands, suggesting program invariance.... However, the exact nature of elements of the handwriting program remain largely uncertain.”

Michael P. Calligiuri & Linton A. Muhammed
“The Neuroscience of Handwriting”, 2012