

Preface

The master's thesis in front of you was written by Alessia Ruf as part of the research on *Human-Computer Interaction* at the Center for Cognitive Psychology and Methodology at the University of Basel. The research group on *Human-Computer Interaction* consists of a team of researchers and students inspired to explore the interaction between humans and interactive technical systems. This thriving research area covers a vast field of topics spanning from the world of digital games to facets of user-friendly websites to questions on the creation and effectiveness of e-learning applications.

The subject of this thesis by Alessia Ruf is the so-called *modality effect*. This effect describes an advantage for learning that can be observed when information is processed using more than one modality. For example, when learning with texts and pictures, learning can be improved by presenting the text auditory instead of visually, thereby utilizing two modalities. A practical situation, where this might typically occur, would for example be the use of an audio guide while looking at art in a museum. However, empirical research on the topic is rather unclear. For instance, there are several different important influencing factors, such as learning time (whether controlled or self-defined by the participant), the duration of the effect on learning (whether short- or long-term) or the learning material used. Therefore Alessia Ruf conducted an extensive digital e-learning study with a sample of 110 Basler Psychology students. She used a total of two times three different learning conditions: visual vs. additive presentation of information and self-defined learning time vs. short or long learning time. The information to be learned was related to the famous fresco The School of Athens by Raphael, which was painted between 1510-1511.

The information about this complex picture that was to be learned (for instance, which figures can be seen and by which attributes they can be identified) was painstakingly digitalized and made interactive. After interacting with the information, the gained knowledge was immediately tested (short-term learning) and again tested a week later (long-term learning), with the help of a knowledge test and a parallel test, both of which Alessia designed herself. In sum, the aggregated data showed the predicted significant impact of presentation modality (i.e. visual presentation was superior to auditive presentation) and of learning time (i.e. learning results were best when learning time could be self-defined). However, the differences were shown to be fairly small and when more closely

examined, for example for short-term vs. long-term learning, they could not be confirmed. Besides the actual learning performance, several possible moderating variables (for example motivation, subjective stress, and interest) were also carefully recorded. Alessia could demonstrate among other things that stress was experienced far more strongly in a system-controlled learning environment. Furthermore, eye movements were measured for a subsample. These measurements showed that participants in the visual condition spent more time reading the text than looking at the picture and that in the self-defined learning time condition participants showed less split-attention effects between the text and the picture than in the system-controlled learning time condition.

Special thanks go to Dr. Mirjam Seckler for her dedicated supervision and support during the work on this thesis. I sincerely congratulate Alessia Ruf on her excellent work. This thesis covers theoretically as well as empirically complex topics of applied cognitive psychology in a highly skillful and competent manner. The explanations are clear and engaging and both methodically and statistically convincing.

Last but not least I would like to thank Springer Verlag for publishing this thesis as part of their initiative BestMasters Psychology to promote young scholars.

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