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Guest Editorial

Age-Differentiated Work Systems

Demographic change is an important social phenomenon in many developed countries. It is characterised by a rapidly increasing average age in the population as a result of longer life expectancies and lower birth rates. In the United States, for instance, there were approximately 37 million citizens aged 65 and over in 2006, or 12.5 percent of the total population. This number is expected to grow to about 72 million by the year 2030, or 19.3 percent of the total population. Demographic change is also having a big impact in the European Union (EU). The proportion of the working population between the ages of 55 and 64 is expected to increase from 56 million in 2006 (11.4 percent of the total population) to 70 million in 2030 (13.5 percent). Furthermore, the number of people in the EU aged 65 and older is expected to increase from 82 million in 2006 (16.8 percent) to 122 million in 2030 (23.5 percent). One way in which the government has responded to the shrinking working-age population is by raising the age at which people can start to receive their full social security retirement benefits. The German government has recently adopted this approach and changed the minimum age from 65 to 67.

The literature tells us that as people age, changes occur in their perceptual, cognitive and motor systems that can have significant effects on their performance and well-being in work systems. The German Research Foundation (Deutsche Forschungsgemeinschaft) responded to this insight by establishing Priority Programme 1184 on Age-differentiated Work Systems in 2005. This interdisciplinary basic research programme brings together a total of 13 research groups from engineering, psychology and economics with the goal of studying the implications and effects of demographic change on human work and developing live-span models to create adequate working and learning conditions for employees of different ages.

For this special issue on age-differentiated work systems, we have collected a series of five papers to give readers a brief but concise overview of macro- and micro-ergonomics research in Priority Programme 1184.

The first paper, written by Julia Weichel, Sanjin Stanic, José Alonso Enriquez Diaz and Ekkehart Frieling, considers job rotation, a classic organizational intervention measure, and analyzes its effect on ageing and impaired employees in the German automotive industry. The results show that older and impaired employees rotate less and that employees who rotate between larger numbers of workstations assess their job performance and health more positively than employees who do not. The second paper, contributed by Melanie Hahn, Michael Falkenstein and Nele Wild-Wall, addresses the growing number of older drivers. In their study, young and old participants performed a simulated driving task in a dual task condition: a visuo-motor tracking task and a visual attention task. An age-related slowing of response speed was observed in the visual attention task. Independent of age, both groups showed similar error proportions and were able to improve their performance with time-on-task. In the tracking task, older participants generally showed poorer performance than the young group and they could not significantly improve their tracking performance with longer task experience. The third paper, by Michael Sengpiel and Hartmut Wandke, investigates the effect of computer literacy on interaction with a computer-based ticket vending machine. To compensate for any potential lack of computer literacy, an experimental

group watched a brief instructional video prior to completing the tasks with the ticket vending machine, while the control group did not. Results indicate that both age groups benefited from watching the video and that the older adults learned enough to become as effective as the younger non-video group. The fourth paper, by Sebastian Vetter, Nicole Jochems, Bernhard Kausch, Susanne Mütze-Niewöhner and myself, deals with age-related changes in visual acuity and their impact on performance in a target detection task using electronic information displays. The results show that differences in response time can be compensated for by an age-differentiated adaptation of font size, but not by an adaptation based on a measurement of visual acuity. The fifth and final paper, by Sandra Sülzenbrück, Matthias Hegele, Herbert Heuer and Gerhard Rinkenauer, analyses the generalised slowing of sensorimotor functions. Although their results show that slowing can be observed in the majority of tasks, they also show that older adults actually performed faster in a line-tracing task, where interindividual variability of speed tended to be lower in the older group than in the younger group. This finding contrasts with the other tests in the paper and with the common view in the literature.

I would like to thank the authors of this special issue for their excellent contributions, without which this ambitious publication project would not have been possible. The German Research Foundation deserves a special acknowledgement for funding Priority Programme 1184 on age-differentiated work systems. I also wish to express my sincere appreciation to Prof. Biman Das and Prof. Helmut Strasser for their kind support in the preparation of this special issue.

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