Headline: National Cheng Kung University/Grand Valley State University Team Wins R. Duncan Luce Outstanding Paper Award (2020)
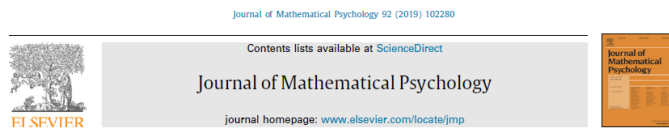
Lead: **Cheng-Ta Yang, Shulan Hsieh, Cheng-Ju Hsieh, Mario Fifić, Yen-Ting Yu, and Chun-Hao Wang** were presented with the prestigious R. Duncan Luce Outstanding Paper Award (2020) on July 31, 2020 for the most outstanding paper published in the Journal of Mathematical Psychology. Their paper *An examination of age-related differences in attentional control by systems factorial technology* won the hotly contested prize over all other papers published in the journal in the preceding three years. The R. Duncan Luce Outstanding Paper Award is sponsored by Elsevier, Inc.

First author Cheng-Ta Yang

About the winners:

Cheng-Ta Yang is in the Department of Psychology and Institute of Allied Health Sciences, National Cheng Kung University, Taiwan; Shulan Hsieh is in the Department of Psychology and Institute of Allied Health Sciences, National Cheng Kung University, Taiwan; Cheng-Ju Hsieh is in the Department of Chemical Engineering, National Cheng Kung University, Taiwan; Mario Fifić is in the Department of Psychology, Grand Valley State University, United States of America; Yen-Ting Yu is in the Department of Psychology, National Cheng Kung University, Taiwan; and Chun-Hao Wang is in the Department of Psychology, National Cheng Kung University, Taiwan

Review

An examination of age-related differences in attentional control by systems factorial technology

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ABSTRACT

A recent study by Ben-David et al. (2014) indicated that older adults process redundant targets with a larger workload capacity than younger adults, even though older adults exhibit generally slower response times (RTs). To investigate the organization of mental processes that underlie age-related differences, we conducted four experiments with redundant-target tasks. In a series of discrimination-type redundant-target tasks (Experiments 1–3), we replicated the age-related capacity advantage; however, the differences were eliminated in a detection-type redundant-target task (Experiment 4). Our results supported the distractor inhibition account, which suggests that age-related differences were due to less efficiency in attentional control to resolve the response conflict when making discrimination decisions. Moreover, we conducted a simulation using a Poisson parallel interactive model, which assumes an inhibitory interaction between two parallel channels that is a result of a limited attentional capacity. An analysis of the model's predictions indicated the two key findings that may account for the age-related capacity differences: the older adults (1) processed the redundant targets with a higher decision criterion (i.e., more conservative in decision-making) and (2) exhibited a greater violation of context invariance (i.e., less degree of controlled attention in dealing with the response conflict). The extensive modeling analyses highlighted the effect of a decline in attentional control on age-related differences in workload capacity.

Download the paper here.

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