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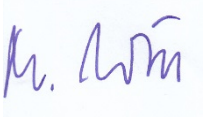
6. August 2024
Dokument1

Dear Professor Włodarczyk,
please find enclosed my opinion of the Dissertation of Mr. Michał Pieniak.

With kind regards,



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DRESDEN concept
Exzellenz aus Wissenschaft und Kultur

Dissertation of mgr Michał Pieniak - Review

"Sensory, emotional, and cognitive effects of olfactory training in children and adolescents"

Mr. Michał Pieniak presents a cumulative doctoral thesis in the subject "Psychology", which deals with the recording and interpretation of olfactory performance in childhood, and effects of olfactory training. The subject of this review are his summaries of 5 papers already published in international journals as first (4) or second (1) author, as well as the General Discussion of this compilation.

The significance of olfaction for clinical issues in childhood psychology still requires scientific recognition. A whole range of neurodegenerative diseases are associated with olfactory disorders, some of which occur at an early age, but the olfactory system also plays an increasingly important role in normal childhood outside of rare diseases.

Mr. Pieniak has structured his dissertation on the olfactory system in childhood as follows:

An abstract both in English and Polish is followed by a short introduction into the subject and subsequent compilation of 5 scientific papers that contribute to Mr Pieniak´s dissertation.

The core problem in his work is the methodology and impact of olfactory training (shown in all 5 positions of the list of publications), which must consider the special features of childhood and adolescence. Since the previous introduction of olfactory training protocols by Hummel et al. in 2009, consisting of 4 odor molecules (phenyl ethyl alcohol, eugenol, citronella, eucalyptol) has been shown to be more effective than spontaneous recovery, Mr Pieniak´s aim was to investigate the effectiveness of such protocols in childhood, a phase of life, in which the brain may develop (and even regenerate) more quickly than in adults.

In children, the immature olfactory system and the fact that neuroregeneration (cell replacement after lesion) is faster in young individuals than in older ones must be considered. In addition, the compliance of children, depending on their stage of development, is generally lower than that of adults, for whom the commercially available olfactory tests were originally designed.

The first (most cited) paper is a review that abstracts the development of olfactory training in the last decade; another one examines mild traumatic brain injury in schoolchildren, while another is devoted to olfactory training in healthy children. The latest papers build a bridge to other senses, such as visual and auditory memory, which behave quite differently from the olfactory system, as the latter has unique

possibilities for regeneration. The author stresses the point that central olfactory processing shares CNS structures also involved in cognitive and emotional processes that develop during childhood.

A general discussion (5 pages) and a detailed bibliography (ca. 220 items) conclude the dissertation.

What is new?

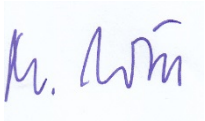
- Raising awareness of a pediatric population that could benefit from olfactory training (OT)
- Healthy children profit from OT (better odor identification)
- In children with mild Traumatic Brain Injury, OT with low-concentrated odors is more effective than OT with high-concentrated odors
- OT may improve fluid intelligence

Evaluation

Mr. Pieniak has skillfully compiled the above-mentioned aspects in childhood from his valuable body of work to date (at least 21 publications with sensory content, since 2020). The methodological work in particular is extremely relevant and represents a very important prerequisite for reliable testing. He also offers ways to proceed, e.g., introduction of neuroimaging techniques. The importance is also reflected in the resonance of the work, which shows that Mr. Pieniak not only writes, but is also read and cited: The publications discussed here have been cited 50 times so far (Scopus; as of 2021 to August 6, 2024).

The work presented shows that Mr. Pieniak is capable of planning clearly thought-out experiments, implementing them in the laboratory and station and presenting their results in high-quality manuscripts in words and pictures. His style is excellent. His level of qualification can be classified as far above average.

I would therefore like to unreservedly recommend the Faculty of Historical and Pedagogical Sciences of the University of Wrocław to accept mgr Michał Pieniak´s written doctoral thesis with distinction.



Dresden & Poznań, August 6, 2024

Prof. Martin Witt