NEWSLETTER

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MultiplEYE

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*Dear reader,

Welcome to the third edition of Multipleye's newsletter. We're enthusiast to share with you the latest updates and stories from our action. This edition features some exciting developments: from the **MultiplEYE** Workshop to *STSM* experiences. One of the things we love most about MultiplEYE is its diversity. Already, our project spans over **20** languages, each bringing its own unique insights and challenges. This expansion isn't just about numbers; it's a testament to our commitment to inclusivity and global collaboration.

Whether you're a researcher, a student, or just a curious reader, this newsletter isn't just about sharing updates; it's about celebrating the varied perspectives, experiences that make our research impactful.

Warm regards,
The MultiplEYE Team

Did you know that?

At MULTIPLEYE, we recognize that a diverse team is not just an ideal, but a necessity to foster innovation, creativity, and comprehensive problem-solving.

62%
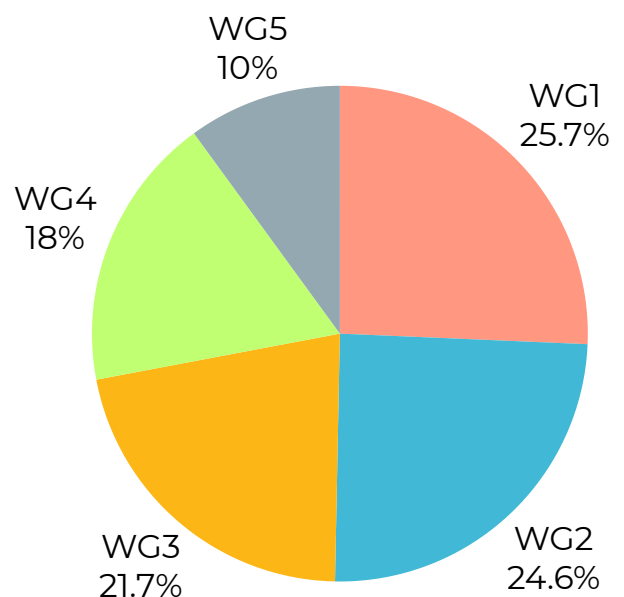FEMALES, PART OF MULTIPLEYE TEAM

38%
MALES, PART OF MULTIPLEYE TEAM

36% of them
ARE YOUNG RESEARCHERS

226 members, number which is continuously growing since MultiplEYE is always open to new participants

WG5
10%

WG1
25.7%

WG4
18%

WG2
24.6%

WG3
21.7%

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The MultiplEYE Workshop

Eye Tracking in Reading a part of
ACM Symposium on Eye Tracking Research & Applications
(ETRA 2024)

Join us at the upcoming MultiplEYE Workshop, an integral part of the ACM Symposium on Eye Tracking Research & Applications (ETRA 2024), taking place from 4-7 June 2024 in Glasgow, UK.

The workshop aims to summarize the current state of the art in research concerning eye movements in reading and enable prospective researchers to present their new ideas. The accepted workshop papers will be published as ACM ETRA Proceedings. The submissions should be between 4 and 8 pages in the single-column ACM Article template. All submissions will go through a single-phase review cycle with at least two reviewers. The Program Committee consists of experts in the fields of eye tracking, psychology, and linguistics.

Organizing Committee:

Pawel Kasprowski,
Department of Applied Informatics, Silesian
University of Technology, Poland

Nora Hollenstein,
Kaunas University of Technology, Lithuania

Lena Jäger,
Department of Computational Linguistics,
University of Zurich, Switzerland

Paul Prasse,
University of Potsdam, Germany

David R. Reich,
University of Potsdam, Germany

EMAIL & CONTACT DETAILS:
Pawel Kasprowski
(pawel.kasprowski@polsl.pl)

Submissions should be anonymized, and submitted via Precision Conference System (Society: ETRA, Conference: ETRA 2024, Track: ETRA 2024 MULTIPLEYE).

Stay tuned with this event in:
www.cost.eu/cost-events/multipleye-etra-2024
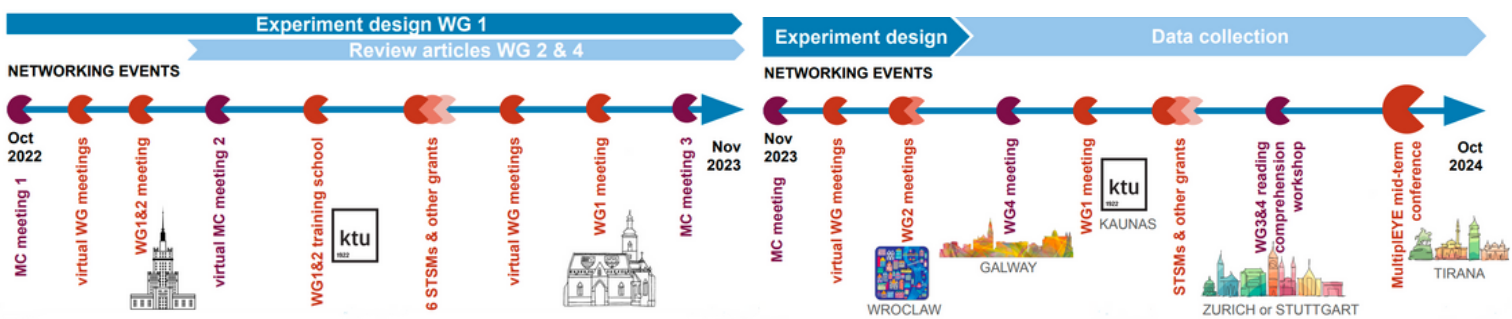www.multipleye.eu/the-multipleye-workshop

AN OVERVIEW OF PAST ACTIVITIES

* 3rd Management Committee meeting

MultiplEYE COST Action had its third Management Committee meeting on November 22th 2023. The meeting was held online, via Zoom.

The MC is in charge of the coordination, implementation, and management of all MultiplEYE's activities as well as supervising the appropriate allocation and use of COST funding.

During the meeting, members and representatives of the Core Group reported about the activities that have taken place during MultiplEYE's first grant period, updates from each Working Group, updates about external funding sources, planned activities for the second grant period starting from November 2023. and data collection status.

Experiment design WG 1
Review articles WG 2 & 4

NETWORKING EVENTS

Oct 2022 — MC meeting 1 — virtual WG meetings — WG1&2 meeting — virtual MC meeting 2 — WG1&2 training school — 6 STSMs & other grants — virtual WG meetings — WG1 meeting — MC meeting 3 — Nov 2023

ktu 1922

Experiment design | Data collection

NETWORKING EVENTS

Nov 2023 — MC meeting — virtual WG meetings — WG2 meetings — WG4 meeting — WG1 meeting — STSMs & other grants — WG3&4 reading comprehension workshop — MultiplEYE mid-term conference — Oct 2024

WROCLAW | GALWAY | ktu 1922 KAUNAS | ZURICH or STUTTGART | TIRANA

* Engaging on data collection Working group 1 meeting in Zagreb

The MultiplEYE Cost Action WG1 meeting, hosted at the University of Zagreb on September 28-29, 2023, marked a pivotal moment for the project's advancement. The gathering commenced with a warm welcome from local organizers, leading to Nora Hollenstein's informative update on 'Data Collection Guidelines' and 'Data Management Plan'. A key highlight was the demonstration of an eye-tracking experiment using the EyeLink Portable Duo device, enhancing understanding of the experimental process. Discussions on stimuli collection, comprehension question guidelines, and the integration of a psychometric test into the experiment were also significant.

On the second day, Marie-Luise Müller from the Leibniz Institute for Psychology introduced the MultiplEYEStore, prompting discussions on data quality and sharing policies. The meeting concluded with a clear agenda for WG1, including finalizing comprehension questions, selecting psychometric tests, piloting the experimental setup, and translating questions into various languages. The event successfully combined rigorous scientific discussions with opportunities for networking, setting a strong path forward for the MultiplEYE project.
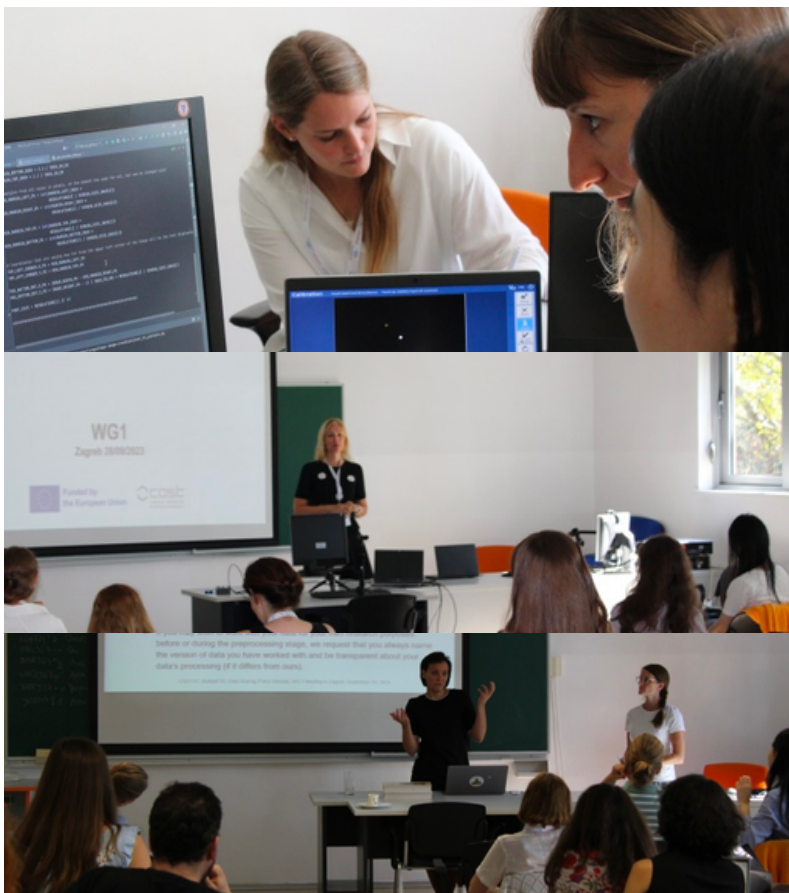
INSIGHTS WG1
EYE-TRACKING DATA COLLECTION
A MULTI-LAB EFFORT TO ESTABLISH NEW STANDARDS FOR THE COLLECTION AND PREPROCESSING OF MULTILINGUAL EYE-TRACKING-WHILE-READING DATA

MultiplEYE's objective is to enable multilingual eye-tracking while reading data collection that can be used as a basis to study human language processing within psycholinguistic research or the evaluation and improvement of machine language processing within machine learning research. One of the biggest challenges of this project is the coordination between labs and languages mostly across Europe but also internationally.

The network of researchers covers almost all Europe and several International Countries. During its first year of implementation, MultiplEYE has made significant advancements in the 'Data Collection' process covering more than 20 languages (with already available texts for data collection in Albanian, Croatian, Chinese, Danish, German, English, Estonian, Lithuanian, Polish and work in progress for Arabic, Basque, Catalan, Czech, Dutch, Greek, French, Hebrew, Italian, Latvian, Portuguese, Romanian, Russian, Spanish, Turkish and Ukrainian). Still, MultiplEYE network is open for contributions in other languages.

The four core principles of MultiplEYE are consistency, quality, open access and diversity supported by three crucial documents delivered by MultiplEYE team: Data Management Plan, Data Sharing Policy and Data Collection Guidelines. These documents offer guidance for anyone going through the data collection process, covering everything from lab protocols to experimental setup, stimuli presentation, comprehension questions, data pre-processing and data quality review.
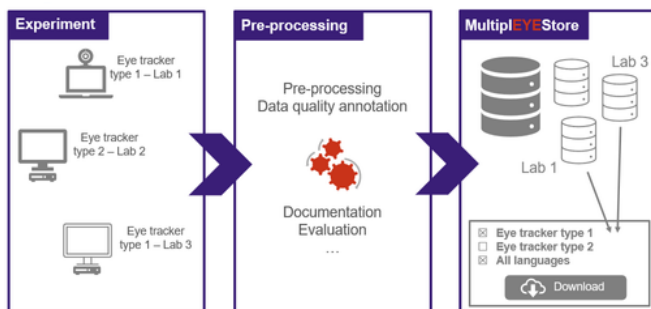
The experimental flowchart aims to help each participant taking part in the action, but not only. Everyone who is wishing to contribute, can easily follow the flow of the work and see where they can contribute. It also establishes a standardised framework for future experiment implementations across different laboratories.

After finalising the collection of the main stimuli text in the major part of the 21 languages involved, the focus is on finalising and translating the comprehension questions for each text. Regarding the comprehension questions, a specific guideline has been created, determining how the questions need to be designed to analyse eye movements compared to the received responses. Additionally, the MultiplEYE team has decided to include an extra session for psychometric tests, in order to collect more information from experiment participants.

All the data gathered from the eye-tracking experiments and the additional tests will be stored in the MultiplEYEStore, easily accessible and downloadable from anyone interested. To ensure consistency across different labs, an experimental setup in Python is under development, offering a standardised software environment. The experiment is designed to accommodate various eye-tracking devices, promoting diversity in equipment usage and facilitating the work of different labs.

MultiplEYE team introduced its intermediate results in the Crosslinguistic Perspective on Processing and Learning (X-PPL) Workshop held in Zurich from November 6th to 8th, 2023, and exchanged ideas and insights with the growing community of researchers working to expand the diversity of languages in the scope of experimental or corpus research on adults or language acquisition.

Deborah Jakobi, an active member of MultiplEYE, representing poster's authors Deborah N. Jakobi, Maroš Filip, Ramunė Kasperė, Nora Hollenstein, Lena A. Jäger and The MultiplEYE Team presented the work-in-progress poster entitled "MultiplEYE: A multi-lab effort to establish new standards for the collection and pre-processing of multi-lingual eye tracking-while-reading data". She showcased the objectives of MultiplEYE and the main achievements so far, attracting new potential collaborators in this ambitious initiative.

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INSIGHTS WG2

The main aim of the WG2 Experiment design & methodology is to investigate the current state-of-the-art eye-tracking technology in reading studies for children. The members of WG2 are multidisciplinary, with experts in engineering, computer science, cognitive and experimental psychology, and linguistics, which gives the advantage of investigating eye-tracking technology in reading studies from different perspectives. The WG2 members have started working on collecting and reviewing survey papers to write a collaborative survey paper which will be a significant contribution to the current state-of-the-art eye-tracking technology in reading studies. Three groups are formed to complete the survey considering three perspectives. Every paper needs to focus on children and eye tracking and reading with a specific focus represented in each group:

Group 1 - modeling perspectives (children - data modeling) (Leaders aāre Cengiz Acartürk (cengiz.acarturk@uj.edu.pl) and Ayşegül Özkan (aysegul.ozkan@uj.edu.pl))

Group 2 - developmental, educational, and societal perspectives (disabilities) (Leader is Timothy Papadopoulos (papadopoulos.timothy@ucy.ac.cy))

Group 3 - linguistic & cognitive perspectives (typically developing children) (Leaders are Dorota Klimek-Jankowska (dorota.klimek-jankowska@uwr.edu.pl) & Izabela Krejtz (ikrejtz@swps.edu.pl))

All groups follow the same meta-analytic study. Initially, the papers are selected from stable resources, such as the Web of Science (WoS) and Scopus. The primary research and reviews from 2015 to 2023 are included in the search. This procedure is carried out with the use of the Ray.Yan software (Ouzzani, Hammady, Fedorowicz, & Elmagarmid, 2016; https://rayyan.ai).

PRISMA flow is also used to optimally extract information on how each variable is studied in a relatively small sample of included articles per group meeting the search criteria. Later a summary of each related paper is prepared. This summary includes the main aim of the study (main hypothesis), the method with a focus on the sample (e.g., typically developing children), and material - what type of reading material is given, eye tracking measures to capture a phenomenon, contribution (new knowledge, novelty), and limitations or future directions. Finally, the meta-merging of summaries in each group takes place for the final review paper. Interested volunteer members of WG2 take an active role in each part of this study. Other volunteers who wish to participate in the summary are invited to contact group leaders.

Prof. Duygun EROL BARKANA, WG2 Leader
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Email: duygunerol@yeditepe.edu.tr

UNLOCKING THE WORLD OF EYE-TRACKING: SOME STSM EXPERIENCES

Nilgün Yücel visited the University of Zurich, Switzerland from 31/08/2023 to 20/09/2023

My STSM journey began with a sense of curiosity and a desire to deepen my knowledge in eye-tracking methodology, specifically in the context of the ongoing MultiplEYE experiment. As I set foot in Zurich and began my collaboration with Chiara Tschirner, my host researcher, I quickly realized that this experience would be nothing short of transformative.

One of the highlights of my STSM was the comprehensive exploration of eye-tracking methodology. From the initial preparations involving Excel files, image creation, and calibration, to the intricate details of data collection and analysis techniques, I was exposed to the entire spectrum of this interesting field.

My overall STSM at the University of Zurich, supported by COST, has been an exceptional journey of skill enhancement, collaboration, and contribution to the MultiplEYE experiment. I extend my gratitude to COST for making this experience possible. I look forward to maintaining a collaborative relationship with Chiara Tschirner and our fellow team members on the MultiplEYE project.

Cui Ding visited the Department of Speech and Language Pathology, University of Zagreb, Croatia from 02/10/2023 to 12/10/2023

From the moment I arrived in Zagreb, I knew that I was about to embark on a multi-faceted journey of discovery and learning. As a new PhD student who wants to become a computational psycholinguist in the future, my mission was clear: to deepen my knowledge of statistics and to bridge it with the complex realms of language processing. Zagreb, with its rich academic traditions, offered me a promising backdrop. I had the privilege to collaborate with the POLIN lab at the University of Zagreb. My goal was to assist them in setting up their eye tracker, an essential tool in our domain. Equally captivating was my endeavor with Experiment Builder. Together with local colleagues, we embarked on the journey of implementing the MultiplEYE experiment. This exploration was punctuated by insightful meetings, particularly with Prof. Palmović, Prof. Kristina, Ana, and Eva.

Zagreb is a very welcoming city and I felt at home from the moment I set foot onto its grounds. The past two weeks felt like a fleeting moment, but I'll always remember my time in Zagreb as a special part of my research journey.

Kristina Cergol visited the Institute for Language, Cognition and Computation, University of Edinburgh, Scotland, UK from 10/05/2023 to 25/05/2023

At the University of Edinburgh, the international scholars I have worked with have readily sparked my interest into computational modelling, providing me with the information I needed to get involved with the corresponding matter – the reason I came here in the first place. The Informatics Forum of the University of Edinburgh is one of the few places in the world where computer science, cognitive science and psycholinguistics come together and join efforts in uncovering the mysteries of language processing and the human mind. I have enjoyed lively discussions at the Informatics Forum where scholars from across different fields meet to discuss their research interests.

Upon my arrival, I was assigned an office and access to the University library and scholarly facilities. Moreover, I could enjoy a number of meeting areas inside the Informatics Forum building designed to accommodate discussions between scholars and the sharing of ideas.
My host, professor Frank Keller, has readily connected me with colleagues with whom I share academic interests. He has also provided me with information on cutting edge talks and lectures connected to the MultiplEYE objectives and my research interests that I attended and much appreciated. All these scholarly efforts have resulted in a number of common research topics we hope to pursue in the future.

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Mohd Faizan Ansari, STSM experience at Nottingham Trent University

It was truly a remarkable experience during my Short-Term Scientific Mission (STSM) at Nottingham Trent University, UK. I gained invaluable knowledge and insights throughout my visit and had the privilege of collaborating with fellow researchers who specialize in eye tracking and psychology. I want to express my heartfelt gratitude to MultiplEYE for this incredible opportunity, and I wholeheartedly encourage others to partake in similar scientific missions.

FUNDED PROJECTS 2023

MultiplEYEStore

Prof. Lena Jäger won an Open Science grant by swissuniversities. MultiplEYEStore aims to support MultiplEYE by making all the collected data accessible via un interface with a data repository hosted by PsychArchives. The project will also enhance the collaboration with Leibniz Institute for Psychology (ZPID) in Trier.

AI4Debunk:

Participative Assistive AI-powered Tools for Supporting Trustworthy Online Activity of Citizens and Debunking Disinformation Jamal Nasir (WG4 leader), along with his consortium, has successfully secured a Horizon Europe project with a budget of €4.9 million. AI4Debunk will explore and develop AI and NLP methods for debunking Disinformation. One of the Work Packages will also investigate whether eye-tracking data can reveal differences in human perception when it comes to viewing true and False News. The project is coordinated by Prof. Inna Šteinbuka (University of Latvia), with 14 partner organisations from 8 countries (Ireland, Italy, Belgium, Netherlands, Spain, Greece, Latvia, and Ukraine).

Recommended SOFTWARE tools

Pymovements is an open-source python package for processing eye movement data. It provides a simple interface to download publicly available datasets, preprocess gaze data, detect oculomotoric events and render plots to visually analyze your results.
https://github.com/aeye-lab/pymovements

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UPCOMING EVENTS IN 2024

WG4 meeting Galway, Ireland
May, 30-31, 2024

WG2 meeting Wroclaw Poland
April, 6-7, 2024

WG1 meeting for experiment support Kaunas, Lithuania
May, 16-17, 2024

WG3&4 Reading Comprehension Workshop Zurich, Switzerland
June, 20-22, 2024

MultiplEYE Mid-term Conference Tirana, Albania
September, 12-13, 2024

MultiplEYE mid-term Conference

Tirana, Albania
12-13 September 2024

The purpose of the MultiplEYE Midterm Conference is to bring together researchers of the different fields involved in the Action and to present related research results focusing on multilingual eye-tracking for human and machine language processing research. All members of the MultiplEYE COST Action (CA21131) are invited to submit an abstract and apply for reimbursement.

Stay tunned for the upcoming call for abstracts!

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RECENT PUBLICATIONS

- Acartürk, C., Özkan, A., Pekçetin, T.N. et al. TURead: **An eye movement dataset of Turkish reading. Behav Res (2023)**. https://doi.org/10.3758/s13428-023-02120-6

- Frank, S.L., Aumeistere, A. **An eye-tracking-with-EEG coregistration corpus of narrative sentences. Lang Resources & Evaluation (2023).** https://doi.org/10.1007/s10579-023-09684-x

- Lena S. Bolliger, David R. Reich, Patrick Haller, Deborah N. Jakobi, Paul Prasse, Lena A. Jäger (2023): **ScanDL: A diffusion model for generating synthetic scanpaths on texts, Proceedings of the 2023 Conference on Empirical Methods in Natural Language Processing (EMNLP 2023),** https://doi.org/10.48550/arXiv.2310.15587

- Lisa Beinborn and Nora Hollenstein. **Cognitive Plausibility in Natural Language Processing. Part of the book series: Synthesis Lectures on Human Language Technologies (SLHLT), Springer Nature, 2023.** https://doi.org/10.1007/978-3-031-43260-6

- Matvieieva, S. **Eye-tracking technology for cognitive linguistics (pp. 51–53). Program and papers of Fourth International Scientific and Practical Conference "Language Philosophy and New Trends in Translation and Linguistic Studies". Kyiv: Mykhailo Drahomanov State University of Ukraine, (2023).** https://cutt.ly/uwqyNpXG

- Ryzhova, M., Škrjanec, I., Quach, N., Chase, A. V., Ellsiepen, E., & Demberg, V. (2023). **Word Familiarity Classification From a Single Trial Based on Eye-Movements. A Study in German and English. Proceedings of the 2023 Symposium on Eye Tracking Research and Applications (ETRA '23) (pp. 1–2, Article No.: 60). New York, NY, USA: Association for Computing Machinery.**

- Shuwen Deng, Paul Prasse, David R. Reich, Tobias Scheffer, Lena A. Jäger (2023): **Pre-trained language models augmented with synthetic scanpaths for natural language understanding, Proceedings of the 2023 Conference on Empirical Methods in Natural Language Processing (EMNLP 2023).** https://doi.org/10.48550/arXiv.2310.14676

- Skrjanec, I., Broy, F. Y., & Demberg, V. (2023). **Expert-adapted language models improve the fit to reading times. 27th International Conference on Knowledge-Based and Intelligent Information & EngineeringSystems (KES 2023). PsyArXiv.** https://doi.org/10.31234/osf.io/dc8y6