Bausteine Forschungsdatenmanagement
Empfehlungen und Erfahrungsberichte für die Praxis von Forschungsdatenmanagerinnen und -managern

Development and Introduction of a Disciplinary Data Repository for Sport Scientists Based on the Example MO|RE Data

eResearch Infrastructure for Motor Research Data

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2024
Zitiervorschlag

Klemm, Katja, Bös, Klaus, Kron, Hannah, Eberhardt, Tanja, Woll, Alexander, Niessner, Claudia. 2023. Development and Introduction of a Disciplinary Data Repository for Sport Scientists. Based on the Example MO|RE Data – eResearch Infrastructure for Motor Research Data. *Bausteine Forschungsdatenmanagement. Empfehlungen und Erfahrungsberichte für die Praxis von Forschungsdatenmanagerinnen und -managern* Nr.1/2024 : S. 2-14. DOI: 10.17192/bfdm.2024.1.8615.

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Abstract

In recent decades, the field of sports science has emerged as a discipline characterised by a substantial accumulation of data at the intersection of social and natural sciences. This wealth of data has contributed significantly to our understanding of human performance, training methods, health and well-being and other sport-related phenomena.

Data on motor performance have been collected in numerous national and international projects over several decades. The Institute of Sports and Sports Science (IfSS) at the Karlsruhe Institute of Technology (KIT) is one of the largest research centres for human motor performance testing and has funded the Competence Centre for Motor Performance and Motor Testing (KOMET). In 2013, the project group of Klaus Bös and Claudia Niessner registered the need of data management for motor test data in sports science. They started the project "eResearch infrastructure for motor research data", which was funded by the German Research Foundation in two funding periods from 2014 to 2023. The MO|RE data[1] repository emerged from this project. MO|RE data is the first disciplinary repository in sports science and offers these features: publication, search, citation, storage, mapping and harmonisation. During its development and subsequent implementation, it has raised many questions. In general, the basic functions of a repository are well understood, as its overall purpose is clear. However, it is crucial to address the specific needs of the sports science community and different target groups to ensure the repository's practical utility post-publication. This includes considerations such as data harmonisation through standardisation to a common unit, linking datasets from different surveys, and other measures to enhance usability.

With the development of MO|RE data, the project group started an experiment on how specific a repository can be in order to have a defined target group and to address a specific need, and at the same time to be used by enough users to still be relevant and used in the future. Now, MO|RE data has to make the step from project object to routine operation.

1 Introduction

In recent decades, the field of sports science has emerged as a discipline characterised by a substantial accumulation of data at the intersection of social and natural sciences. This wealth of data has contributed significantly to our understanding of human performance, training methods, health and well-being and other sport-related phenomena. Furthermore, with the advent of wearable technology for fitness tracking, the field is facing new challenges and opportunities in data management and analysis.

[1]We want to thank the German Research Foundation (DFG) (Project number: 432649291) for their funding and the Serviceteam RDM@KIT for the cooperation during our common project MO|RE data.

The need for data sharing, data re-use and reliable data infrastructure is high across all scientific disciplines. Several studies have investigated the willingness to share own data and/or the interest in using "foreign" data in different scientific disciplines[2] [3] [4]. For sports science, Kloe et al.[5] conducted a demand analysis in 2019 with 60 scientific experts and 83 users of human performance tests. They found that 81.7% of sports scientists in German-speaking countries are interested in data sharing. Among sports scientists with self-generated data, it was even 91.5%.

Data on motor performance have been collected in numerous national and international projects over several decades. However, the current state of research is characterised by inconsistent and sometimes contradictory results[6]. Research questions such as "Has motor performance changed over the past decades?" or "Are there regional differences in motor performance?" can currently only be answered with limited statistical rigour. In addition, many of the datasets collected are never published, depriving interested research communities of valuable insights.

The Institute of Sports and Sports Science (IfSS) at the Karlsruhe Institute of Technology (KIT) is one of the largest research centres for human motor performance testing and has funded the Competence Centre for Motor Performance and Motor Testing (KOMET). The institute has now collected over 250000 data points in (partner) projects and published 29 test profiles for different target groups, different settings and different motor abilities[7]. An essential part of the database are the results of the German Motor Test, which are available for Germany as well as for 12 other countries worldwide[8]. In 2013, the project group of Klaus Bös and Claudia Niessner registered the need of data management for motor test data in sports science.

The project group therefore asked whether there was a solution to the following questions:

[2] Carol Tenopir et al., 'Data Sharing, Management, Use, and Reuse: Practices and Perceptions of Scientists Worldwide', *PLOS ONE* 15, no. 3 (11 March 2020): e0229003, https://doi.org/10.1371/journal.pone.0229003.

[3] Jillian C. Wallis, Elizabeth Rolando, and Christine L. Borgman, 'If We Share Data, Will Anyone Use Them? Data Sharing and Reuse in the Long Tail of Science and Technology', *PLOS ONE* 8, no. 7 (23 July 2013): e67332, https://doi.org/10.1371/journal.pone.0067332.

[4] Michael C. Whitlock, 'Data Archiving in Ecology and Evolution: Best Practices', *Trends in Ecology & Evolution* 26, no. 2 (1 February 2011): 61–65, https://doi.org/10.1016/j.tree.2010.11.006.

[5] 'Open Data im sportwissenschaftlichen Anwendungsfeld motorischer Tests', *German Journal of Exercise and Sport Research* 49, no. 4 (1 December 2019): 503–13, https://doi.org/10.1007/s12662-019-00620-2.

[6] Tim Olds et al., 'Worldwide Variation in the Performance of Children and Adolescents: An Analysis of 109 Studies of the 20-m Shuttle Run Test in 37 Countries', *Journal of Sports Sciences* 24, no. 10 (1 October 2006): 1025–38, https://doi.org/10.1080/02640410500432193.

[7] Klaus Bös et al., 'KOMET - Kompetenzzentrum motorische Tests. Hintergrund & Testbeschreibungen', vol. 161, KIT Scientific Working Papers (Karlsruher Institut für Technologie (KIT), 2021), https://doi.org/10.5445/IR/1000130943.

[8] Klaus Bös et al., *International Physical Performance Test Profile 6-18* (Feldhaus Edition Czwalina, 2021), https://www.feldhaus-verlag.de/sportwissenschaft/schriftreihen/dvs-schriftenreihe/1507/international-physical-performance-test-profile-6-18-e-book.

- Where can we safely store human motor test data and related data (body composition, physical activity etc.)?
- What features need to be available besides data storage?
- How can we safely publish (personal) data for re-use with respect to privacy issues?
- What metadata and identifier guidelines need to be followed?
- How do we ensure data quality?
- How can we ensure the re-usability of the data?

Until 2013, there was no solution for data management, storage and publication solution in sports science or for human performance test data in general. To address this lack, the IfSS started the project “eResearch infrastructure for motor research data” and was funded by the German Research Foundation in two funding periods from 2014 to 2023 (cf. Fig. 1). The “Operation” phase was characterized by basic operations with a minimum of resources. During this time, the focus was on engaging with the community to learn about their needs, opinions and questions around open data, data sharing and data access. The results of the two funding phases are explained in the following chapters.

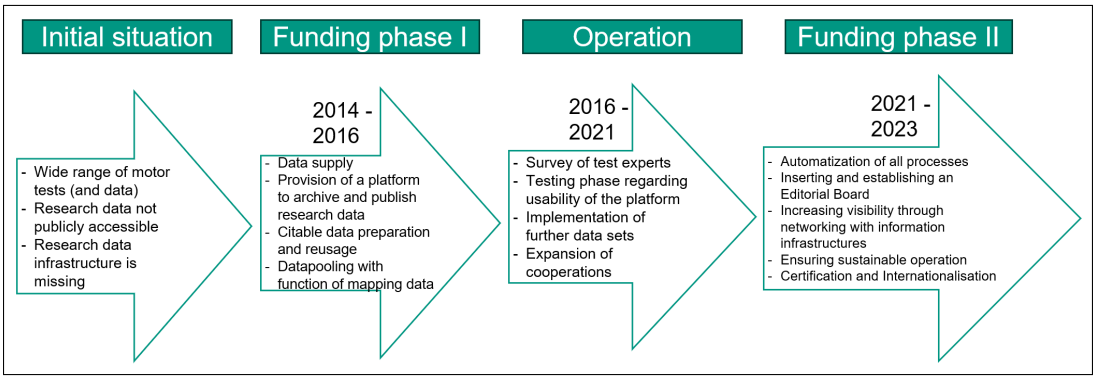

Figure 1 Project phases of MO|RE data (own illustration)

The answers to the above questions about the problems and hurdles in the development and implementation phases are discussed below. It also analyses the current stage of development and future obstacles and opportunities.

2 The MO|RE data repository

The MO|RE data repository (https://motor-research-data.de/) was conceived and developed in two funding phases. The first focused on the general idea and the first usable version of the repository. The second focused on the usability and sustainability of the repository. The results of both phases are presented in this chapter.

2.1 Where can we safely store human motor test data and related data (body composition, physical activity etc.)?

Human motor performance data includes, for example, numbers of tasks and activities related to age and gender (e.g., how many push-ups can an 8-year-old boy do?). The most commonly used related data (called "additional data") are e.g., Body-Mass-Index (BMI), physical activity and other health or fitness measures. This means that the datasets are very homogeneous and, compared to "big" datasets in the natural sciences, very small and require little storage. However, sports science data is sensitive, personal, and closely related to health, making it particularly worthy of protection.

Repositories are places where digital objects are stored and made available to a public or restricted group of users[9]. The first data repository was founded in 1962 at the University of Michigan and is called the "Inter-University Consortium for Political and Social Research (ICPSR)". It provides access to social science data for researchers to use in their own research. There exist almost 500 repositories in Germany and 3500 worldwide, which are listed on the re3data platform (https://www.re3data.org/)[10]. They can be structured mainly by data type, subject and function. To date, there is no other repository in sports science and/or for human motor performance data.

Therefore, the project group developed an online platform with access for data providers to upload their data and for data users to search for data. The online platform was developed by an external company (mb-mediasports©), the servers and storage are provided by the Steinbuch Centre for Computing at the KIT. This ensures the sustainability of the platform, independent of the duration of the project or the company. This online platform is now established and better known as the **mo**tor **re**search **data** repository (MO|RE data).

2.2 What features need to be available besides data storage?

MO|RE data addresses sports scientists and researchers in related disciplines, who also work with or generate motor test data as well. In addition, practitioners should be encouraged to use MO|RE data as an information platform, e.g., to get an impression of the current state of research or to compare their data (e.g., from a school class) with a scientifically based data set.

In order to reach these two target groups, different functions have to be combined. Therefore, MO|RE data offers the following functions:

[9] bwFDM, 'Was Ist Ein Repositorium?', forschungsdaten.info, accessed 29 August 2023, https://forschungsdaten.info/themen/veroeffentlichen-und-archivieren/repositorien/.

[10] 'Re3data.Org - Registry of Research Data Repositories', https://www.re3data.org/, accessed 29 August 2023, https://doi.org/10.17616/R3D.

1. Publication: Datasets (in format .xlsx) and their metadata (as generated PDF file) can be published via MO|RE data under a Creative Commons licence (CC BY-SA or CC-BY). This makes the dataset visible to other users and allows it to be downloaded for re-use.
2. Citation: Datasets can be identified using the Digital Object Identifier (DOI). Each dataset receives an identifier when it is published. The metadata PDF document contains the APA, BibTex, RefMan and EndNote citing schemes.
3. Storage: Publication includes the archiving of datasets, providing a sustainable and secure option for users to store their own data.
4. Search: In MO|RE data, all published datasets can be found using the search function (cf. Fig. 2). Users can search for test items, age, gender, authors and many other variables in single or combined search terms.

Figure 2 Homepage of the MO|RE data repository

5. Mapping and harmonisation: When uploading a dataset, users can match variables of their file with prepared variables in MO|RE data (cf. Fig. 3). This improves the search function and generally the findability of data in MO|RE data. This is one of the main features of MO|RE data. Many test profiles are published in sports science. There are more than 700 test items[11], often performed in different ways. For example, for the performance of the sit-ups test to measure abdominal muscle strength, there are 60 different instructions in the international literature, which differ in time, leg and/or arm position or other complications (e.g., ball in the neck)[12]. The mapping and associated test descriptions define a standard of performance to enable comparability and reusability. In addition, the individual mapping scheme can be saved in the user profile for future use.

For both types of users, we have developed a manual that covers all the important functions and descriptions for the correct use of MO|RE data. In addition, other user material such as video tutorials and frequently asked questions (FAQs) are available to reach all users and to cover upcoming questions.

[11] Klaus Bös, *Handbuch Sportmotorischer Tests* (Verlag für Psychologie, Hogrefe, 1987).
[12] Klaus Bös, *Deutscher Motorik-Test 6-18 (DMT 6-18): Manual Und Internetbasierte Auswertungssoftware.* (Hamburg: Feldhaus Edition Czwalina, 2016).

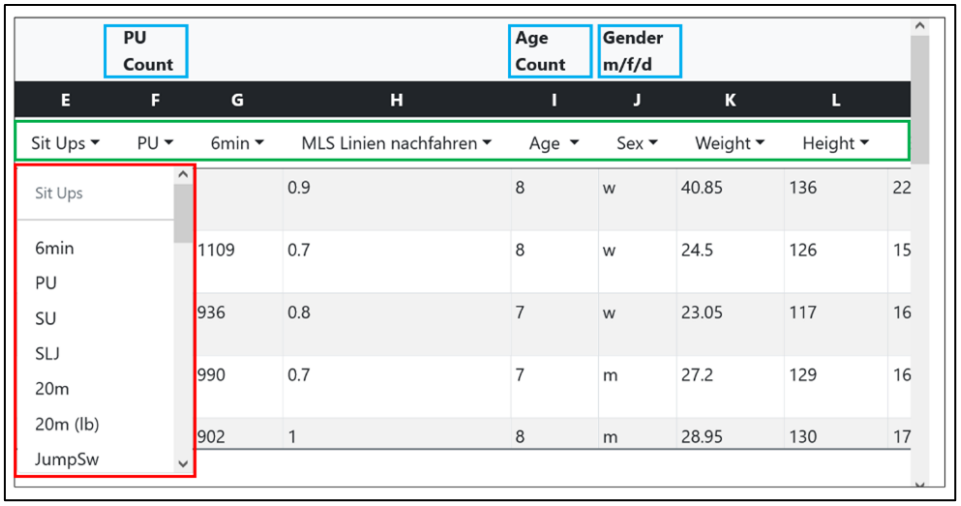

Figure 3: Mapping function at MO|RE data (screenshot of the uploaded excel sheet, green box=variable names by uploader, red box=dropdown menu of mappable variables for the first column, blue boxes=already mapped variables incl. units)

The design of the repository is user-friendly and intuitive. The aim was to demonstrate the combination of a scientific basis and value for all target groups.

2.3 How can we safely publish (personal) data for re-use with respect to privacy issues?

The repository MO|RE data has been developed in two funding phases (cf. Fig. 1). The first funding phase ended in 2016, when the first version of the platform was released. This first version included the main functions such as uploading, downloading, searching and citing, but was very basic in terms of usability and clarity. The technical infrastructure was hosted by the IT company mb-mediasports. This company is also involved in the existing data input platform of the IfSS (https://dmt.motoriktest.eu/Login.aspx) and is therefore very familiar with the subject of motor test data.

They used the Microsoft Azure environment for the SQL-database, web server and storage of data and related information such as metadata and user information. During the second phase of funding, the focus was on improving usability and ensuring sustainability. For this reason, MO|RE data was completely migrated to the technical environment of the KIT. Storage, web server and database are used at the Steinbuch Centre for Computing. The generic repository RADAR4KIT is responsible for the publication of the datasets and the creation of DOIs[13]. With these adaptations, MO|RE data will be based on persistent infrastructures that will ensure a sustainable repository and will not be dependent on a single company.

[13] 'RADAR | Forschungsdaten', accessed 18 April 2023, https://radar.kit.edu/radar/de/home.

Before uploading data to MO|RE data, users must accept the terms of use during the registration process. They are also informed about the data protection issues in the Privacy Policy. Both documents can be found on the repository homepage. To ensure data privacy within the datasets, they are checked in two ways: automatically and by the Editorial Board. Users are encouraged to check the anonymity of the datasets and to learn about their privacy responsibilities.

2.4 What metadata and identifier guidelines need to be followed?

Metadata in the research context contains structured information about research results, in our case about the dataset. They are stored or linked together to the corresponding dataset[14]. The metadata scheme is based on the guidelines of the DataCite registry. The scheme contains more than 25 fields to describe the dataset properly. It includes six mandatory fields such as author, title, year of publication, abstract, licence and publisher and voluntary fields such as country, language or research design.

MO|RE data assigns a persistent identifier, the DOI, to each published dataset. By using the DOI, datasets can be cited securely and are easy to find. MO|RE data receives the DOI from the internal infrastructure RADAR4KIT, which registers the identifier with DataCite.

2.5 How can we ensure the re-usability of the data?

Quality management is an important aspect of repositories such as MO|RE data. It ensures standards and quality for all involved groups of people (developers, providers, users). The quality management of MO|RE data (cf. Fig. 4) includes three main aspects: (1) data quality, (2) data access and (3) expert quality. These aspects are based on Wang & Strong´s concept of data quality[15] and adapted to the target group and purpose of MO|RE data.

1. Data quality includes implementation quality (Q1) and statistical proofing (Q2). Studies in sports science are very individual and data collection depends on the setting, target group and circumstances. In addition, measurement protocols differ nationally and internationally, so these two quality criteria are crucial.
   Implementation quality refers to the integrity of the according metadata description as well as the information about the data collection, the related study and the project itself. Statistical proofing includes four filtering principles for raw and aggregated data. The filter principles check all datasets for impossible values, implausible values for age and sex, implausible values in general and duplicates.

[14] bwFDM, 'Metadaten Und Metadatenstandards', accessed 29 August 2023, https://forschungsdaten.info/themen/beschreiben-und-dokumentieren/metadaten-und-metadatenstandards/.

[15] 'Beyond Accuracy: What Data Quality Means to Data Consumers', *Journal of Management Information Systems* 12, no. 4 (1996): 5–33.

They are based on thousands of international and national data. The process is described transparently in the user manual.

2. Data access includes aspects of access quality such as a citable publication with a digital object identifier and a public usefile available for download.
3. Expert quality includes two groups of people who are part of the quality control process. First, the Editorial Board, which reviews all datasets using the four-eyes-principle and consists of editors from the field of sports science and information infrastructures. They are located at the KIT library and the IfSS and possess a permanent position at KIT. Second, the Advisory Board, which advises the MO|RE data developers in quarterly meetings on all relevant aspects and consists of experts from the field of sports science and information infrastructures (https://www.ifss.kit.edu/more/english/205.php). Both groups improve the quality of the repository itself, as well as its acceptance by users. They have a high level of internal motivation for the repository and the development of the repository. In a relatively small community like sports science, this aspect is very important to gain the trust of the community and potential users.

All quality aspects in MO|RE data are moderated by the FAIR data principles[16].

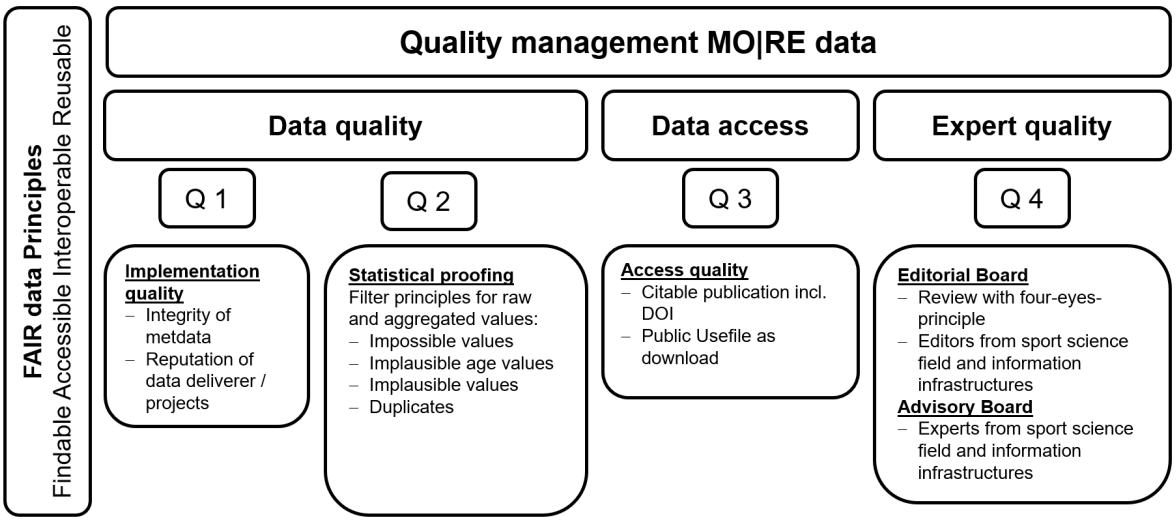

Figure 4 Quality management scheme of MO|RE data
(modified after Albrecht et al. 2016)

In summary, MO|RE data is the first disciplinary repository in sports science[17], which has raised many questions during its development and subsequent implementation. In general, the basic functions of a repository are well understood, as its overall purpose is clear. However, it is crucial to address the specific needs of the sports science

[16] Mark D. Wilkinson et al., 'The FAIR Guiding Principles for Scientific Data Management and Stewardship', *Scientific Data* 3, no. 1 (15 March 2016): 160018, https://doi.org/10.1038/sdata.2016.18.

[17] Claudia Albrecht et al., 'Handreichung Forschungsdatenmanagement in der Sportwissenschaft', 2016, https://doi.org/10.5445/IR/1000061538.

community and different target groups to ensure the repository's practical utility post-publication. This includes considerations such as data harmonisation through standardisation to a common unit, linking datasets from different surveys, and other measures to enhance usability.

Finally, the project team is currently working on certification by the Core Trust Seal. Due to the delay in the final launch of the repository, this could not be completed in 2023.

3 Summary of the current state and future developments

In the currently published version, the repository can be used during a part of the whole research data lifecycle[18]. In MO|RE data, researchers can publish and archive their own data sets or reuse external datasets.

Special emphasis has been placed on innovative approaches to data re-use. The MO|RE data project makes an innovative use of the DOI identification system. Users of MO|RE data can easily search for these datasets by entering the DOI in the database.

A notable feature of the MO|RE data is that it allows scientists who wish to cite specific parts of the dataset for their own publications to generate a separate DOI. This allows for the persistent identification of parts of a dataset that may change in the future. This is a valuable solution for ensuring data persistence and integrity.

The perspective of MO|RE data can be seen from two sides: first, from the perspective of optimising the repository, and second, from the perspective of adding further functionality and thus developing the coverage of the lifecycle.

3.1 1st Perspective: Optimisation

The repository can be optimised with respect to these three main aspects and tasks:

1. Ongoing work and optimisation based on the FAIR principles[19] is an aspect that affects all usability and functionality.
2. Reaching more data owners and data users must be the future goal, as there is a large discrepancy between attitude (cf. chapter 1) and action.
3. Beyond acquisition in the sports science community, the aim is to network and collaborate with scientists from other disciplines. This will optimise and increase the value of the repository and the data it contains.

[18] bwFDM / KIM, 'Der Datenlebenszyklus', accessed 17 November 2023, https://forschungsdaten.info/themen/informieren-und-planen/datenlebenszyklus/.
[19] Wilkinson et al., 'The FAIR Guiding Principles for Scientific Data Management and Stewardship'.

3.2 2nd Perspective: Development

The following aspects describe the development opportunities provided by the repository.

1. Improving functionality:
   1a. Publication: There are several ways to improve the functionality of publishing. First, the Creative Commons licence used can be extended to cover other use cases. Datasets, that need to be published under a specific embargo can be published at MO|RE data (e.g., Attribution Non-Commercial or Share-Alike and Non-Commercial). Second, after publishing the dataset and obtaining the DOI, references to other (social media) platforms can be automatically linked, e.g., research gate, LinkedIn or X.
   1b. Citation: in order to extend the citation functionality and improve the user experience, additional PIDS[20] can be integrated. In the registry of research data repositories re3data[21], most repositories use DOI as MO|RE data does. Other PIDs such as handle or PURL can be offered to increase the user acceptance.
   1c. Storage: The dataset storage function can be extended by offering to store different file formats in addition to the standard .xlsx format. Formats such as .sav, .csv, .sas or .mat can be integrated to improve compatibility with statistical programs for processing the datasets.
   1d. Search: The search icons are currently limited to the test items but can be extended to all mappable variables. The metadata is also searchable, but cannot be seen in the overview of the search results. Therefore, the search results can be improved by implementing a sidebar for specifying the results.
   1e. Mapping and harmonisation: The mapping variables, which are currently limited to 29 variables, can be extended. Variables relating to other relevant information on physical activity, psychological aspects, socio-economic status, and much more can be included into the mapping function. The aim is to work closely with the community and listen to its needs.
   Harmonisation rules and protocols will be extended and possibly automated, following the Maelstrom guidelines for retrospective data harmonisation developed by the Maelstrom research team[22]. These guidelines aim to ensure the quality, reproducibility, and transparency of the data harmonisation process. Building upon these guidelines, retrospective harmonization involves an iterative process encompassing a sequence of closely linked,

[20] Jens Klump and Robert Huber, '20 Years of Persistent Identifiers – Which Systems Are Here to Stay?' 16, no. 0 (22 March 2017): 9, https://doi.org/10.5334/dsj-2017-009.
[21] 'Re3data.Org - Registry of Research Data Repositories'.
[22] Isabel Fortier et al., 'Maelstrom Research Guidelines for Rigorous Retrospective Data Harmonization', *International Journal of Epidemiology* 46, no. 1 (1 February 2017): 103–5, https://doi.org/10.1093/ije/dyw075.

interdependent, and frequently integrated steps.

2. Explore new disciplines within the sports science community. Currently, MO|RE data is focused on scientists working with human motor performance testing, but other sub-disciplines such as sports education, sports history or sports psychology may also be interested in a subject repository as well.
3. Finally, the range of functions can be extended. An automatic analysis of the descriptive data (including graphics), an integrated blog or a discussion forum are just a few examples. However, it is important to rely on the core functionality of a repository. Other developments may evolve the repository into a different infrastructure format. Information on these ideas can be found in chapter 5.

4 Limitations

Data in sports science is closely related to health data and therefore sensitive data about individuals. Big research questions as e.g. „To what extent do health aspects such as constitution, mental health, mortality and the prevalence of non-communicable diseases correlate with human motor performance?" can only be answered with large data sets. However, due to data protection laws, open data access does not allow other important health data (BMI, blood pressure) or information on personal data (geolocation data, social status) to be published in MO|RE data, as this makes it possible to identify individuals. The link between health data and physical fitness data and follow-up data (longitudinal datasets) is of great scientific interest.

The above-mentioned data and information are already available from studies, but only a very small part can be made publicly available in MO|RE data due to aforementioned barriers. The exchange of data with interested researchers therefore currently takes place mostly in person and often requires long and expensive journeys, or sometimes does not take place at all due to the high effort involved.

5 Discussion & Outlook

With the development of MO|RE data, the project group started an experiment on how specific a repository can be in order to have a defined target group and to address a specific need, and at the same time to be used by enough users to still be relevant and used in the future. Now, MO|RE data has to make the step from project object to routine operation. The basic operation is guaranteed through the migration to the RADAR4KIT infrastructure and the support of the IfSS in providing human resources, which is not a matter of course in the German scientific system.

The repository market is large and very heterogeneous. There are some big players such as Zenodo, Figshare, GitHub, Mendeley Data, but there are also hundreds of disci-

plinary repositories with very limited target groups and therefore individual functions. In the field of research data management, the developments of the last 10 to 20 years have been big and fast, and there are still many ongoing developments at national and international level (NFDI, EOSC, RDA …). But at some point, every development reaches its peak.

Sports science as a scientific discipline is unique in that it is based on and still receives its input from various mother disciplines (e.g., history, psychology, etc.). This fact also has consequences for the tools used and accepted or the technical environment. Researchers focusing on sport psychology are more likely to use the tools of psychologists than a generic sports science tool. Therefore, the development of discipline-specific tools and infrastructures should be critically questioned. In 2023, the German Society of Sport Science established a committee on research data management in sports science, chaired by Prof. Melanie Krüger[23]. This committee aims to bring together all the interests, experiences and future ambitions of the sports science community in Germany. The first step was to conduct a survey on the usage, wishes and needs of sports scientists in the German-speaking sports science community. First results were presented in autumn 2023 and will be published in 2024[24].

MO|RE data has a specific target group and the numbers of users can still be expanded to a certain extent. Currently (as of November 2023) 34 datasets with a total of 51479 items are published. These datasets are from national studies, but the project group has good contacts with the international community. Much has been done in recent months to increase this number, e.g. publication of disciplinary journal articles, online workshops, news on sports science related mailing lists and by community related organisations. However, the national and international community still needs to be convinced that the publication of data is a prerequisite for a good scientific work. A lot of communication work needs to be done at different levels (online, national and international conferences, journals).

Technical developments (cf. chapter 3.2) are still possible, but also limited to the core functions of a repository. Therefore, the project group at the KIT aims to find further developments for MO|RE data and the sports science community regarding the RDM. The needs and wishes of the community will come to light with the above-mentioned survey, but the first steps have already been taken. The Institute of Sports and Sports Science will soon develop a research data centre called “Motor Performance and Physical Fitness” as part of the NFDI consortium KonsortSWD[25], which aims to make data sets accessible, which cannot be published in a repository (e.g., due to embargos). In

[23] Deutsche Vereinigung für Sportwissenschaft, ‘ad-hoc Ausschüsse’, 2023, https://www.sportwissenschaft.de/die-dvs/struktur-und-gremien/ad-hoc-ausschuesse/.

[24] Eckardt, N. & Krüger, M. (2023). Nachhaltiges und offenes Forschungsdatenmanagement – ein Thema für die deutsche Sportwissenschaft?!. In Schlesinger, T., Grimminger-Seidensticker, E., Ferrauti, A., Kellmann, M., Thiel, C. & Kullik. L. (Hrsg.): Leistung steuern. Gesundheit stärken. Entwicklung fördern. 26. dvs-Hochschultag. Band 301: Schriften der Deutschen Vereinigung für Sportwissenschaft (S. 90). Hamburg: Czwalina.

[25] ‘KonsortSWD’, KonsortSWD, accessed 29 August 2023, https://www.konsortswd.de/konsortswd/.

addition, there is a close collaboration with the NFDI4Health to enhance work at the intersection of social and health sciences, an area of particular relevance to sports science. As a use case for sensitive data in sports science, the MO|RE data team is part of the Leibniz Science Campus “Digital Transformation in Research” (DiTraRe)[26]. These collaborations and projects are essential for the progress of RDM in sports science, as well as for the visibility of sports science in the scientific community in general.

Without the work on the repository, the project team would never have gained these networks and the development of RDM in sports science would not be at the stage it is now. As a project team, we can only motivate other small scientific disciplines to start with a tool or feature for the representative community at some point.

[26]’Leibniz Wissenschafts Campus – Digital Transformation of Research (DiTraRe)’, FIZ Karlsruhe und Karlsruher Institut for Technology (KIT), accessed 27 February 2024, https://ditrare.de.