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Title:	Thea Fühner & Prof. Dr. Reinhold Kliegl: "Data for action" in matters of school sport.
Episode:	05

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Speaker Announcement (under Music): Listen.UP. The Podcast of the University of Potsdam.

Prof. Reinhold Kliegl: The transfer of knowledge is very important for us.

Prof. Reinhold Kliegl: But at the same time, it is also important to always evaluate whether it helps. We should not simply believe that just because we have a good idea, that this good idea will translate into something that really has an effect.

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Speaker 1: Today: "Data for action" in matters of school sport. With Reinhold Kliegl and Thea Fühner.

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Prof. Reinhold Kliegl: I am particularly enthusiastic about the EMOTIKON project because it not only has a scientific perspective but is also directly relevant for advising schools and now also communities on how we can counteract the decline in physical fitness at primary school age.

Thea Fühner: And I just found it very interesting that it is a comprehensive project, a state-wide project in all of Brandenburg, so that sports policy or school policy really cares about it. And I also think it's very important that it's being done, especially - we'll come back to this in a moment - how the development of physical fitness has declined in recent years. That is already dramatic.

Prof. Reinhold Kliegl: So that means we really want to bring in our data for intervention proposals.

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Speaker 1: "Daten für Taten"

Speaker 2: This is the subtitle of the EMOTIKON primary school sport project, a large-scale statistical study on the topic of school sport.

Speaker 1: The study evaluates the motor skills of third graders in the state of Brandenburg.

Speaker 2: Thea Fühner and Prof. Reinhold Kliegl have been working for three years at the Institute for Training and Movement Sciences at the University of Potsdam, which is conducting the EMOTIKON study in cooperation with the Ministry of Education, Youth and Sports of the State of Brandenburg.

Speaker 1: Thea Fühner is a sports scientist; Reinhold Kliegl is professor emeritus of cognitive psychology.

Speaker 2: After his retirement, he moved to the Institute of Exercise and Movement Sciences as a senior professor.

Speaker 1: And how did this unusual step come about?

Prof. Reinhold Kliegl: So it's very dangerous when you ask me something like that. I always tell you so much about it straight away. But the core idea was really that after retirement I wanted to start something completely new and above all do things that were no longer so much determined by basic research, but rather by questions of application. And then this opportunity arose to do research on the physical fitness of children, which was another interest of mine, to research something like physical skills and to transfer my knowledge from my previous field of work.

Speaker 2: As a cognitive psychologist, Reinhold Kliegl studied, for example, gaze control in reading using very precise mathematical modelling and multivariate statistics. These are now also valuable tools in his new field of activity.

Prof. Reinhold Kliegl: That's what this multivariate modelling and computational modelling was. That was a bit of the trademark of our earlier research. And these methods and approaches can now be transferred very well to another area. And so I'm not just an apprentice, but can also teach important things in the new field and make important contributions myself. So it is a very nice topic. With Ms Fühner, for example, who studied sports science, I am at eye level. So I'm not only the one who learns everything about sports science from her, but she can also learn a bit about multivariate statistics from me.

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Speaker 1: The EMOTIKON primary school sports project has been running since 2009 - with participation being compulsory for all Brandenburg third-graders in public regular schools and public schools.

Thea Fühner: And because participation is compulsory, we receive around 20,000 data sets per school year, i.e. around 20,000 third graders in the state of Brandenburg participate in EMOTIKON, so that we now actually have around 200,000 data sets in our database with the current data set, which now covers the last year, the school year 2021/2022, and can therefore also calculate very interesting and really statistically meaningful analyses.

Speaker 1: And why the third primary school level in particular?

Thea Fühner: I would say that it is in the middle of primary school. Because primary school in Brandenburg goes up to the sixth grade. That means the third grade is when the children have already been in primary school for two, three years and still have years to go. And it's perfect in the middle, and then also for children where a deficit is perhaps detected, to offer corresponding support through remedial teaching, to support the child in its development accordingly and to be able to start there.

Speaker 2: The EMOTIKON test battery was designed according to the motor performance model of the German sports scientist Klaus Bös.

Speaker 1: This takes into account different parameters such as endurance, strength, speed, coordination and agility.

Thea Fühner: And it was important to us that we develop a test battery that is also really practicable for the school setting. That means that the amount of material required is relatively low and that the time required is also low. Because if you imagine that a physical education teacher has about 25 or 30 children in her class and has to test these children every year, then we can't come around the corner with a lot of time and a lot of material, but these have to be really practicable and economical tests. And there we decided on a total of six different text tasks that cover different areas of physical fitness. These are the six-minute run to assess aerobic endurance, the 20-metre sprint to assess speed. This is a so-called star run, which is a course, a movement course, in which the children have to complete various forms of movement in different directions. This is a test of coordination under time pressure. Then we have the start of the long jump to assess the speed of the lower extremities. We have a medicine ball push test, where the children have to push a medicine ball away from their chest to assess the quickness of the upper extremities. And as the last test, we have a so-called one-leg stand test to assess static balance.

Speaker 2: It is important to understand that the variety of tasks set for the EMOTIKON test have very different functions, says Prof. Reinhold Kliegl.

Speaker 1: For example, the 6-minute run is a reliable indicator of a child's physical health, while good success in medicine ball throwing can also indicate a problem with obesity.

Prof. Reinhold Kliegl: That children, if they are overweight, can push the ball further than children who are not overweight or who are slightly underweight, just because of Newton's law. This means that we have to look at these different tasks separately and still analyse them in relation to each other. And at this level we also find very big differences in how much a child improves in the third grade.

Prof. Reinhold Kliegl: And what we have seen, perhaps first of all of great importance, is that the development of the physical fitness of the children in these different tasks across the cohorts, that is, if you compare the children of 2011 with the children of 2019, they are very, very different. So the endurance run, the 6-minute run for example is a task where the children are continuously running less far, so in the newer and younger cohorts. And that is particularly important and particularly noteworthy, and also particularly worrying, because this test is actually the best as an indicator of health status.

Speaker 2: The EMOTIKON Primary School Sport Study thus proves a worrying trend in the period from 2009 to today. However, the data is not only analysed for the state of Brandenburg as a whole, but also at the level of the individual child; the schools; the municipalities and the districts.

Speaker 1: This makes it easier to make targeted intervention suggestions. And it shows that the children's physical fitness also has a social dimension that should not be underestimated.

Prof. Reinhold Kliegl: In my opinion, an important finding of Emoticon is that we can show very convincingly that children who grow up in the suburbs of Berlin are on average much fitter than children

who grow up in regions far away from Berlin. And that, of course, has something to do with the fact that well-heeled parents live in the suburbs and that some of the schools are better equipped. It is also easier to recruit good sports teachers for schools in the surrounding areas than for schools located in the JVP. And all these factors, the parents' income, the parents' interest in supporting their children, all these factors actually have a very strong influence. Then at the end, how fit the child is in the third grade. And you have to think about that. And these are all things that actually have nothing to do with biology, but have something to do with the environment in which the child grows up. And if it has something to do with the environment in which the child grows up, then it is also our damned responsibility to ensure that the framework conditions are set in such a way that the children have equal opportunities and that this does not depend so much on where the child comes from.

Speaker 2: Another finding of EMOTIKON is that the physical fitness of third graders correlates with the children's body mass index, which is already collected from first graders. This means that the children already have a certain disposition towards physical activity or inactivity when they start school.

Speaker 1: And here, too, there is a correlation with the social structure of the respective community. Counteracting this inequality of opportunity is all the more important because there is also a statistical correlation between physical endurance and the development of cognitive abilities.

Prof. Reinhold Kliegl: We know that on average, physically fit children also do somewhat better in mathematics and reading. The correlation is not super high. It is - in the medium range - a correlation, and we have not yet fully understood the connection. It may be that, on the one hand, greater physical fitness leads to a child having a better supplied brain, for example, and that this better supplied brain also leads to better cognitive performance. But it can also be the other way round, that children who are in a good cognitive condition are the ones who are better able to take advantage of the opportunities and possibilities offered by physical education and, of course, achieve better results because they understand better how to deal with such tasks, how to complete such sports tasks. These are all things in which children differ. How well do I understand the instructions, how clever am I at figuring things out? What trick can I use to jump a little further or throw the ball a little further? Or how do I divide my time when I run for 6 minutes? So there are always a lot of cognitive processes involved, which of course also have an influence on fitness. And that's why a lot of experimental research is needed to better understand the interplay between physical fitness and mental fitness. Not only in children, but also in adults.

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Speaker 1: What recommendations can be derived from all these findings?

Thea Fühner: There are very specific recommendations from the World Health Organisation, which are updated every few years and are also published according to outgoing research, i.e. evidence-based. And the World Health Organisation actually recommends for all children between the ages of 5 and 17 that they should be physically active for at least 60 minutes a day and should also do actual strengthening exercises for the muscles two to three times a week. What is now also becoming more and more relevant are the so-called sitting times due to the pandemic, that much takes place at home, that homeschooling is at home, that various leisure facilities such as sports clubs or any child and youth facilities were closed. If the children were at home a lot and sat at home a lot, they didn't have the

opportunity to move around at all, and that's why the World Health Organisation recommends reducing sitting time to a minimum and instead doing the activities that can really be done standing up.

Speaker 2: In fact, "movement-friendly teaching spaces" are also being considered as part of the intervention programmes proposed by the EMOTIKON team - and there are already trials with standing desks in the classroom.

Prof. Reinhold Kliegl: I recently saw a picture where a classroom is being restructured and the children are being taught at desks, so they are no longer sitting, but standing desks are being placed in the classrooms.

Prof. Reinhold Kliegl: So I am really also convinced that this is an approach that we have not looked at enough so far. We think so much in our traditional forms of teaching, also in school. And yes, that comes from this rather disciplinary thought. The children have to learn to concentrate and to work continuously on a task. And perhaps we need to think about whether it would be beneficial for these other goals if we were to include more opportunities for movement.

Speaker 2: Moreover, in addition to the classic physical education classes, which specifically build up muscles, additional physical activity programmes are to be created that are less competitive and performance-oriented - thus reducing the risk of frustration, especially among less athletic children.

Prof. Reinhold Kliegl: The teachers, the primary school teachers, they always tell us that the children in the third grade or in primary school have an incredible urge to move. So you don't have to motivate them or think about how to get them to move. Instead, if you offer them something, they really take it up with enthusiasm.

Prof. Reinhold Kliegl: And a very nice example is the headmaster of a primary school in Oberhavel, who is the lead dancer for movement during the break. So of course that is something that totally fascinates the children, that the headmaster himself somehow dances to them as a fitness trainer, so to speak. And I think such surprising elements that are really a lot of fun, the children are enthusiastic about it and nobody thinks about doing it to be fit, but they just do it because they have fun, because it's funny and because it's a good community experience. So we should, we have to approach this problem much more from the side. Not with new regulations and new rules and new obligations, but somehow looking for activities that have fitness as a side effect and that people don't even notice. They realise that they are doing something for their health. Or the children, above all, of course, something for their health.

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Speaker 2: For Thea Fühner, the ideal school sport would be that the children are offered a sports lesson every day, not just three times a week - and that the sports lessons are really child-oriented.

Thea Fühner: That we don't come around the corner with exercises that are actually for older children or for adults, that the whole thing is designed in a child-friendly, playful way and that the children don't really notice, let's say, that they are exerting themselves right now, but that they are perhaps so caught up in a story or a game that they are doing a lot of running or a lot of climbing or strength exercises in between and don't really notice it. That would be my perfect idea of physical education.

Speaker 1: Implementing interventions that affect the curriculum is a very difficult business in which one should not expect miracles - at least in the short term, says Reinhold Kliegl.

Speaker 2: At a time when social groups are drifting apart, the EMOTIKON-primary school sports project is definitely a good example of meaningful cooperation between politics and science - and could perhaps also serve as a prototype in completely different contexts.

Prof. Reinhold Kliegl: And I noticed very quickly with the EMOTIKON project that it is a project where an incredible number of social groups work together. They work together in a really great way. The schools are involved, the teachers in the schools, the ministry is involved, the state sports federation is involved, science is involved. And why does it work? Because Emoticon has a common goal, namely the goal of thinking about the physical fitness of our eight- to nine-year-old children and perhaps providing new insights into this. And we can only do that if all these groups work together. Science can't do it alone, the state sports federation can't do it alone and neither can the ministry. And that means that if we succeed with the things we have described here, if we see that the findings that come from such a project are really data for actions that are then also implemented somewhere, then that should actually be an example that through cooperation with the common goal, something can actually still be moved that people are also enthusiastic about.

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Speaker 1: Produced by speak low on behalf of the Innovative University of Uni-Potsdam.