

# Approaches to the life and influence of the Austro-American sports physician Hans Kraus (1905-1996)

Rudolf Müllner<sup>1,\*</sup>

<sup>1</sup> Centre for Sport Science and University Sports, University of Vienna, Vienna, Austria

\* Corresponding author: Centre for Sport Science and University Sports, University of Vienna, Auf der Schmelz 6A, A-1150 Wien, Austria  
Tel: +43 1 4277 488 30  
E-Mail: rudolf.muellner@univie.ac.at

## ORIGINAL ARTICLE

### Article History:

Submitted 21<sup>th</sup> June 2019

Accepted 13<sup>th</sup> November 2019

Published 26<sup>th</sup> November 2019

### Handling Editor:

André Gogoll, Swiss Federal Institute  
of Sport Magglingen, Switzerland

### Editor-in-Chief:

Martin Kopp  
University of Innsbruck, Austria

### Reviewers:

Reviewer 1: Martin Burtscher,  
University of Innsbruck, Austria

Reviewer 2: Anonymous

## ABSTRACT

The Austrian physician Hans Kraus was a central figure in the founding of the American fitness movement. His life and work are to this day almost unknown both within the Austrian scientific community and to a broader public.

Kraus was born in Trieste in 1905 and obtained a doctorate in medicine from the University of Vienna in 1929. Subsequently he trained as an orthopaedic surgeon at the Vienna General Hospital. After the annexation of Austria into Nazi Germany in 1938, he fled to the United States and worked at the prestigious Columbia Presbyterian Hospital (now the New York Presbyterian Hospital).

His field of research was the physical performance and fitness of the American youth. At the beginning of the 1950s Kraus noted enormous deficits compared to the European youth. This attracted much public attention and led to significant public health interventions such as the founding of the "President's Council on Physical Fitness and Sports". This council was intended to encourage the American population to engage in physical activity. In addition, Kraus gained great prominence as one of John F. Kennedy's doctors. On the occasion of his death in 1996, the *New York Times* described Kraus as the "originator of sports medicine in U.S."

This study has two goals: Firstly, it will outline the migrant biography of Hans Kraus based on the work of Susan Schwartz (2005). Secondly, drawing on Foucault's concept of biopolitics it will analyze approaches to the classification of Kraus's scientific work in the cultural history of fitness and physical enhancement. The knowledge gained by physicians such as Kraus is interpreted as knowledge of power, which has a disciplining and regulating effect on the body and the population.

### Keywords:

Hans Kraus – history of fitness – improvement cultures – body enhancement – history of sport science

### Citation:

Müllner, R. (2019). Approaches to the life and influence of the Austro-American sports physician Hans Kraus (1905-1996). *Current Issues in Sport Science*, 4:014. doi: 10.15203/CISS\_2019.014.

## Introduction

On March 6<sup>th</sup> 1996 Hans Kraus died in his Manhattan apartment. He was 90 years of age. Kraus was a pioneer of promoting health by keeping fit and was a forerunner of medically evidence based fitness sports in the 20<sup>th</sup> century. The *New York Times* (NYT, 1996) describes him in an obituary as "the father of sports medicine in the United States".

The U.S.-American fitness movement of the 1950s was heavily influenced by the work of Hans Kraus. These USA initiatives were, furthermore, the basis for subsequent, somewhat delayed, fitness- and sport-for-all-actions in Europe at the beginning of the 1970s. Concepts of health prevention, sport- and fitness-for-all started in Northern, Western and Central European countries at the end of the 1960s and at the beginning of the 1970s when big sport organizations first in Scandinavia,

followed by Germany (Dilger, 2008; Hartmann-Tews, 1996; Jütting, Krüger & Baumann, 2017) and Austria (Adam, 1971; Adam, 1972; Holzweber, 1971, 1995, 2002; Müllner, 2014, 2017a, 2018a) began to realize mass sport and sport for all campaigns. These were totally new concepts of a particular health oriented sport for big parts of the population (Hägele, 2008, 2010; Müllner, 2017b, 2018b; Scholl, 2018). Sport participation increased; more specifically, a larger number of women and the elderly participated in sports. Radical new thinking and practice of sports was established. Fitness sports became a counter concept to the traditional hegemonic masculine performance oriented sport. This was a radical extension of traditional sports understanding and the beginning of new individual (self-)enhancement concepts as we know it today (Andreasson & Johansson, 2014; 2014a, pp. 91-93; Graf, 2013).

It is evident that the modern fitness sports movement is deeply associated with the development of the modern western welfare and industrial state and the postwar consumer society. Thus, it is not surprising that the roots of the modern fitness movements emerged within the US during the 1950s. In that period the USA had already developed great know-how and knowledge about health-oriented exercises and about its implementation across the population (Black, 2013; McKenzie, 2013). Two key people – Dr. Sonja Weber and Dr. Hans Kraus – are credited with influencing the American fitness movement in a sustainable manner. Both were of Austrian origin. As yet, neither of them is well known in Austria, either to the sports scientific community nor to a broader public. No biographic material exists so far for Dr. Sonja Weber.

Thus, this study will focus on two aspects. Firstly, it will sketch the adventurous path of the life of Hans Kraus from his birth in the Habsburg monarchy, his socialization within and orientation towards sports, his apprentice years at the Vienna University Medical School and ultimately his flight to New York City. Secondly, it will attempt to classify his scientific and medical life's work within the context of the birth of modern fitness discourses and the establishment of preventive and rehabilitative approaches in sports science.

The main source of the life and the scientific career of Hans Kraus is a detailed biography from Susan E. B. Schwartz entitled *Into the Unknown. The Remarkable Life of Hans Kraus* (Schwartz, 2005). This biography is largely based on personal interviews with Hans Kraus. The text is characterized by a very close relationship between Schwartz and Kraus. Schwartz was herself a patient of Kraus in the 1990s.<sup>1</sup>

## Biographic Frame

Hans Kraus was born in Trieste/Fiume on November 28<sup>th</sup> 1905. The port town at that time belonged to the Habsburg Monarchy. Kraus' family – his father Rudolf originated from Pilsen

(in today's Czech Republic) – acquired quite an amount of material wealth. His father had worked his way up within the Trieste shipping industry and had eventually founded his own company. At the outbreak of the war – Hans was then 9 years old – the family moved to Zurich in Switzerland where Hans grew up in comfortable and privileged family surroundings. He was taught English by a private teacher, the novelist James Joyce.

Sports played an important role within the family. His father was quite a successful athlete. He had allegedly won the prestigious bicycle Race Vienna–Trieste (Sturm, 2013) over more than 500 kilometres on a high-wheeled bike. From his early childhood onwards, Kraus was taken to the mountains, and skiing was a favourite pastime. Sports and movement in general would become an important factor in Kraus' biography. Staying in the mountains, hiking and especially extreme climbing became more than favoured leisure activities. Being in a state of motion was a lifelong and fundamental attitude of Kraus. The knowledge he acquired in sports deeply shaped his approach to the body and his understanding of recreation, rehabilitation and medicine as a whole.

At the end of the First World War Rudolf Kraus transferred his company to Vienna where the family lived an upper-class life in a mansion near the Schönbrunn palace. During the 1920s – strictly against the will of his father – Hans Kraus decided to study medicine at the prestigious University of Vienna Medical School.

Kraus was a good but not an outstanding student (Schwartz, 2005, p. 21). In 1930 Kraus graduated from the Medical School and began as an intern in the Vienna University Hospital emergency department. Afterwards he specialized in orthopaedic surgery and worked as an orthopaedic surgeon both at the Vienna University hospital and in private practice where he treated many Viennese sportspeople. During his vacations he was a passionate, extremely ambitious, successful and performance oriented, rock climber. His success and skill was such that among his climbing partners in the 1930s was the Italian star climber Emilio Comici. (Historisches Alpenarchiv). During the 1930s Kraus then established himself as a physician.

Hans Kraus was influenced by two powerful fields of knowledge and practice. The first was the developing field of modern sports. The young Kraus had been brought up in a haute bourgeois upper-class family and he was socialized into and by sports from the outset of his life. This was already before the First World War. Sports in that period in the Habsburg Empire was a privilege to a minority of aristocrats and male upper-class people. But it became more and more popular after World War One and especially within the larger urban areas like Vienna, Budapest or Prague. Even so, in smaller towns like Trieste/Fiume, sports developed into a mass phenomenon (Marschik, 2009; Müllner, 2009; Norden, 1998). Movement and the understanding of movement – especially outdoor sports such as rock climbing and skiing – shaped both Kraus' professional life as a sports physician as well as his private recreational activities into his old age. The other principal area of interaction and focus

<sup>1</sup> If nothing else is indicated I refer to the many findings of this biographic study in this following chapter.

was his commitment to medicine and orthopaedics. Kraus was educated at the Vienna University Medical School. The Vienna Medical University had an excellent worldwide reputation (Kotz, 1987).

Kraus was, most definitely, very much shaped by his vocational training at the Vienna "Ambulatorium for Orthopaedic Surgery" at the University of Vienna, under one of the most influential pioneers in orthopaedics there has ever been – Adolf Lorenz (1854-1946), the father of the later Nobel prize laureate Konrad Lorenz (1903-1989) (Kotz, 1987; Skopec, 1987). Orthopaedics then was in its infancy. One of its roots can be found in caring for the crippled of the First World War. Another Viennese pioneer in that field, beside Adolf Lorenz, was Hans Spitzky (1872-1956). He was, like Kraus, also very much affected by sports and the German Gymnastic-Movement. Spitzky was a forerunner in using kinesiotherapeutic methods in treating war-disabled people (Ullmann, 2003). Hans Spitzky was also a lecturer at the University Vienna Medical School. During the 1930s he taught "Orthopaedic Indications and Therapy" and "Orthopaedic Surgery" (Ullmann, 2003, pp. 109-112) So it is quite probable that Hans Kraus was one of this experienced orthopaedic surgeon's students. The specific medical knowledge he encountered at the Vienna University was therefore an important factor for Kraus' further scientific career in the USA, which then directly developed into the evolution of the American fitness movement (Coser, 2004).

## Flight and New Beginning in Exile

After the occupation of Austria by Nazi Germany in March 1938 Rudolf Kraus, Hans' father, was able to save most of the members of his extended family from the holocaust, thanks to his sound financial background. Hans Kraus' uncle and his wife resisted fleeing: both were murdered in the Nazi concentration camp of Auschwitz. On 12<sup>th</sup> of March 1938 Hans Kraus left Vienna by train to Trieste. He was the first of his family who fled. From Trieste he went to Switzerland to withdraw some money, then to France and to London. From London he travelled again to Trieste and then he left Italy by ship from Naples to New York where he arrived on July 5<sup>th</sup> 1938 (Washington, D.C., National Archives and Records Administration Family Search). The Kraus family was among approximately 30.000 Austrians who found exile in the USA between March 1938 and December 1941, when the USA entered the war (Eppel, 2004). Hans Kraus was not raised in the Jewish faith. He himself was only held to be one "quarter Jewish" – after the Nuremberg Laws of 1935. His father Rudolf and his mother Ella, both had a Jewish parent (Schwartz, 2005, p. 48). One of his first activities after his arrival in New York City was to contact the New York Presbyterian Hospital. There he got the chance to give a presentation of his previous work and this was a success. His medical license was approved and he started with a part-time contract at the prestigious New York

Presbyterian Hospital.<sup>2</sup> Also, in New York Kraus continued his sports activities, skiing and rock climbing, which helped him to establish a strong network. At the centre of the North American east coast skiing community was Hannes Schneider, the Austrian skiing star of the interwar period (Allen, 2007). This sport also proved a profitable source for patient referrals and brought Kraus a number of patients.

### *The Kraus-Weber-Tests: Initial Steps forward to Birth of a Modern Fitness Movement*

In 1940 Hans Kraus started working in a newly established department at the New York Presbyterian Hospital, the "Posture Clinic". Together with Dr. Sonja Weber (also an Austrian migrant) he worked with American children of poor posture<sup>3</sup>. For four years they treated hundreds of children with poor posture and posture muscle problems. During that period, they developed a new test to examine the muscular status and the fitness of the children the "Kraus-Weber-" or "K-W-Test". They did a lot of testing and research and published the findings in several papers (Kraus, 1949; Weber & Kraus, 1949). In parallel with this work, they developed a series of strengthening and loosening exercises in order to be able to precisely assess and then affect the muscular activity of the individual child.

As was his habit, Kraus spent his summer vacations in 1952 and 1953 in Europe climbing in the Alps. Furthermore, he made contacts to be allowed to test school children between the ages of six and sixteen in Switzerland, Austria and Italy. He conducted these tests with his now research assistant and also climbing partner, Bonnie Prudden (married name Hirschland). They discovered that only eight percent of the European kids flunked the K-W-test. Compared to the results of tested U.S. kids the results were shocking. 56,6 percent of the American students had flunked the same test (Kraus & Hirschland, 1953). The main question which arose following these results was, what were the reasons for that big difference?

Taking all that he had observed and experienced in Europe and in the US into consideration, Kraus believed that the explanation must be found in the different living conditions. Americans had become affluent after the war, and were already using many labour-saving appliances like cars, escalators, elevators and partaking in sedentary leisure pursuits such as watching television. In Europe, in comparison, such technological developments were on a far lower scale and people had to live a more physically challenging daily life. In short, the European lifestyle was physically much harder than the US-American one. Kraus did not believe in superiority of the genes of the European youth. Thus, a socio-cultural explanation seemed to be obvious. Kraus and Hirschland (1953) stated in their lean but ground breaking study "Muscular Fitness and Health", "that European children do not have the benefit of a highly mecha-

<sup>2</sup> For detailed regulations concerning working and admission conditions for scientific personal see (Eppel, 2004, pp. 988-990).

<sup>3</sup> For a history of posture see (Gilman, 2018).

nized society; they do not use cars, school buses, elevators or any other labour-saving devices. They must walk everywhere. Their recreation is largely based on the active use of their bodies. Lack of sufficient exercise, therefore, constitutes a serious deficiency comparable with vitamin deficiency. Prevention of this deficiency is an urgent need" (Kraus & Hirschland, 1953, p. 18; Kraus & Hirschland, 1954). These were prototypical arguments following the concept of "civilization disease". They can be found in many nations which transformed from a society of shortage into a society of abundance (Lengwiler&Madarász, 2010, p. 20).

Another argument was that the gymnastic and public school gym classes in the USA were not efficient enough. "Our physical education needs a very definite expansion and active participation on a wider base, not only in high schools, but even more important, in elementary schools" (Kraus & Hirschland, 1953, p. 19). Kraus started investigating the differences between European and American gym programmes. He found out that the European programmes tried to improve fitness for all school children. In American gym programmes the emphasis was more on team and ball sports like basketball, baseball or football. So he postulated: "Sports by themselves don't get you fit. You need to be fit to play sports" (Schwartz, 2005, p. 114). Another negative effect of the team sports was that it preferred the already fit children within the teams. They got more ball contacts, more playing opportunities and the unfit, the overweight stood on the sidelines, yet they were the ones who needed the exercise.

"Instead of picking the most physically gifted and welding them into winning teams for the glory of the school (and the coaches), the emphasis should be on all the students" (Schwartz, 2005, p. 115).

#### *Popularization of Fitness*

Gradually Kraus' research results were no longer published exclusively in scientific journals but little by little found their way to the broader public arena. Thus, it happened that Hans Kraus got an invitation to the White House and there he was able to present his findings and ideas in front of President Eisenhower, his Vice-President Richard Nixon and top-class fitness experts.

This meeting got enormous media attention and it was highlighted by several leading journals such as "Sports Illustrated" and "Newsweek". Especially an article in "Sports Illustrated" entitled "*The Report that shocked the President*" achieved great attention. The subtitle of the article encapsulated the alarming message: "It (the report, R.M.) came from two physical fitness experts (Kraus, Prudden, R.M.) who tested U.S. and European youngsters and it shows that the U.S. is rapidly becoming the softest nation in the world" (Boyle, 1955, p. 30). Thus the topic of the lack of fitness of Americans became very prominent and publicly discussed during the summer of 1955. The meeting had political consequences and was followed by concrete official measures. Just one month later, on September 16<sup>th</sup>

1955 Vice President Richard Nixon informed Hans Kraus that President Eisenhower had initiated a Conference on Fitness of American Youth which Richard Nixon was chairing.

#### **"President's Council of Youth Fitness".**

In summer 1955 President Eisenhower suffered a heart attack and had to spend seven weeks in hospital. It took him months to recover. It can be supposed that this incident also made a contribution to initiating a bigger American fitness and health initiative. In July 1956 President Eisenhower established the Executive Order 10673, the "President's Council on Youth Fitness" (PCYF) (Administration: Dwight D. Eisenhower). Along with Kraus, the most prominent public health and fitness experts were involved in that council. It was the beginning of Kraus' assistant, Bonnie Prudden's career as a nationwide known fitness role model. Years before Jane Fonda, Prudden published books, had weekly television spots and was presented on the cover of Sports Illustrated in 1957 (Sports Illustrated, August 5, 1957).

The PCYF existed for five years from 1956 until 1960. It conducted an intensive public information campaign. The purpose of which was to raise awareness of fitness. Parents and youths should be convinced that they were themselves responsible for their own health and fitness and that it was their civic duty to keep their bodies in shape.

The PCYF was the first public fitness campaign in the USA and it served as a prototype for further fitness campaigns in western countries, especially in Europe. The PCYF, in essence, still exists. It is situated in the Department for Health and Human Service. When President J.F. Kennedy came into office in 1961 he renamed the Council "President's Council on Physical Fitness" to address all age groups.

Understanding the founding of the PCYF is essential in order to understand the establishment of the modern fitness movements in western societies. It was the first and most influential campaign to promote health and fitness discourses and practices. The Austro-American Physician Hans Kraus played a key role in initiating this movement. Kraus was not the only one who argued for more fitness but at the right moment he supplied politicians with scientific evidence of the lack of health and fitness. In the sense of the French sociologist Michel Foucault, Kraus acted as a key agent of "bio politics" (Folkers, 2014). As a physician and as an orthopaedist he provided the scientifically based power of knowledge for U.S. politics. Medicine and medical discourses are, as Foucault argues, "political techniques of intervention" (Foucault, 2014, S. 102). "Medicine is a power of knowledge which extends onto the bodies of a population and which has regulative and disciplinary effects" (Foucault, 2014, S. 102). In combination with the gradually developing exercise and sports science this medical knowledge provided the scientific basis for the birth of the modern fitness movement. The PCYF brought as the US-Historian Shelly McKenzie concludes "the concept of personal fitness to national attention. In so doing, the council helped broaden consumer interest in exercise

and paved the way for a dramatic expansion of the commercial fitness industry in the 1960s" (McKenzie, 2013, p. 15).

The pursuit of fitness was not a new thing. It was not an invention of the 1950s, but in the course of the first decade after the Second World War fitness became a new dimension and took on much bigger importance in the eyes of the American general public. Two central threads of discourse can be identified which argue for more fitness within the American population. The first thread is a culture-critical one. The main reason for the new "softness" of American citizens was seen in the achievements of the consumer society. Cars, elevators, escalators, TV, excessive nutrition and general lack of physical strain in everyday life were identified as the main causes for deficient fitness of the population. Exactly the same arguments can be found 15 years later in the European fitness debates (Müllner, 2014, 2018a). McKenzie (2013, p. 9) characterizes this as follows: "Exercise became a technique to exorcise the perils of consumption."

Closely connected to these arguments was the other thread of discourse. It was the deficient fitness of the young American recruits and the fear of military strength of the US army at the time of the Cold War (Black, 2013; Rider & Witherspoon, 2018). There is not the space to discuss all the measures, the organization, goals, problems, the effects of, but also the resistance against, the PCYF in detail (McKenzie, 2013, pp. 14-53). A central topic thereby is the degree of obligation to be fit or to keep yourself fit. This affects the relationship between the "state" and the individual. It affects the strategies of enforcement of governmental fitness programmes. The tension between fitness as a "technology of the self" or fitness as a means of the external must be managed (Foucault, 1993a, 1993b; Scholl, 2018), a topic which was a very sensitive one in the economic liberalism of the USA during the 1950s (Martschukat, 2016). Summarizing, it should be emphasized that Austro-American physician Hans Kraus played an important role in this complex process of initiating the American Nation into a new age where fitness first became a matter of civic duty and developed visibly into a matter of course for everybody.

### Kraus' second career as J. F. Kennedy's doctor

After Kraus had attained such a significant amount of public attention in the course of the 1950s, the year 1961 marked another important section of his life.

In June 1961 one of Kennedy's doctors called Hans Kraus to come to Washington to examine the president's back. Kennedy had undergone three back operations and had been suffering from severe pain throughout his presidency. The state of health of a president is of course a politically sensitive issue. On the surface, within media coverage, it is extremely important to present a healthy, fit and strong political leader. Thus, Kraus had to conduct his therapy, as far as possible, under cover.

Kraus worked with Kennedy from autumn 1961 to October 1963. After Kraus's death the medical records were given to the

president's library in Boston. Susan Schwartz has thoroughly investigated these records. What she found out was that Kraus flew two to three times a week from New York to Washington to treat Kennedy. The treatment consisted "almost entirely of exercise" (Schwartz, 2005, p. 183). Kennedy's back became better and better and in September 1963 Kraus declared Kennedy as cured.

Kennedy was also very much concerned about the public health status of the Americans. His legendary article in "Sports Illustrated" – *The soft American* – highlights a milestone in the modern American fitness and prevention history. Kraus's merits were explicitly emphasized:

The first indication of a decline in the physical strength and ability of young Americans became apparent among United States soldiers in the early stages of the Korean War. The second came when figures were released showing that almost one out of every two young Americans were being rejected by Selective Service as mentally, morally or physically unfit. But the most startling demonstration of the general physical decline of American youth came when Dr. Hans Kraus and Dr. Sonja Weber revealed the results of 15 years of research centering in the Posture Clinic of New York's Columbia-Presbyterian Hospital – results of physical fitness tests given to 4,264 children in this country and 2,870 children in Austria, Italy and Switzerland. (Sports Illustrated, 26th December 1960)

After Kennedy's assassination, Kraus was like many others in Kennedy's inner circle "left with a feeling of emptiness" (Schwartz, 2005, p. 211). Kraus had built up a genuine friendship with Kennedy. After Kennedy's death Kraus continued his work as a physician into old age. He kept himself physically fit by rock climbing. On March 6<sup>th</sup> 1996 he died in his apartment in Manhattan.

### Conclusion

The biography of the Austrian-American physician Hans Kraus documents an exciting individual life story. It first shows an extremely successful medical and scientific career. It is marked by flight, expulsion from National Socialist Austria and integration in the exile country of the USA. Kraus' successful career is based not least on the knowledge he acquired at the prestigious medical faculty of the University of Vienna. Kraus was also a lifelong athlete, his passion for climbing and the experience he gained are decisive factors for the development of his views and methods in regard to prevention and rehabilitation<sup>4</sup>. This concentrated knowledge and expertise was also decisive in establishing the first public US fitness movement, the "Presidents

<sup>4</sup> An outcome of his therapeutic work is the well-known „Spray-and-Stretch-Method" which Kraus described for the first time in the year 1952. (Simons, 1999, p. 127)

Council on Youth Fitness" in 1956, which in turn set an example for further fitness campaigns in Europe and was also an important first step towards the establishment of the worldwide fitness industry as we know it today.

To describe Kraus as the "originator of sports medicine in U.S.", as the NY Times did on the occasion of his death, is probably a little exaggerated, because sports medicine per se is broader than Kraus' life's work, which is primarily oriented towards sports orthopaedics. However, he was undoubtedly a decisive driving force.

## Funding

The author has no funding or support to report.

## Competing Interests

The author has declared that no competing interests exist.

## Data Availability Statement

All relevant data are within the paper.

## References

- Adam, N. (1972). Die Fit-Welle rollt. In Österreichische Bundes-Sportorganisation (Eds.), *Sport. Österreichisches Sportjahrbuch 71/72* (S. 74–78). Wien: Brüder Hollinek.
- Adam, N. (1971). Sport der Siebzigerjahre. *Sport. Österreichisches Sportjahrbuch 70/71* (S. 52–53).
- Allen, E. J. B. (2007). *The culture and sport of skiing: From antiquity to world war II*. Amherst Mass.: Univ. of Massachusetts Press.
- Andreasson, J., & Johansson, T. (2014). *The Global Gym. Gender, Health und Pedagogies. Global Culture and Sports*. Hampshire: Palgrave Macmillan.
- Andreasson, J., & Johansson, T. (2014a). The Fitness Revolution: Historical Transformations in the Global Gym and Fitness Culture. *Sport Science Review*. XXIII (3-4), 91-112. Doi: 10.2478/ssr-2014-0006
- Black, J. (2013). *Making the American body: The remarkable saga of the men and women whose feats, feuds, and passions shaped fitness history*. Lincoln u.a.: Univ. of Nebraska Press.
- Boyle, R. H. (1955). The Report that shocked the President. *Sports Illustrated*, 14<sup>th</sup> August, 30–33, 72–73.
- Coser, L. (2004). Die österreichische Emigration als Kulturtransfer Europa-Amerika. In F. Stadler (Ed.), *Emigration - Exil - Kontinuität: Vol. 2.1. Vertriebene Vernunft II. Emigration und Exil österreichischer Wissenschaft 1930–1940* (S. 93–101). Münster: Lit-Verlag.
- Dilger, E. (2008). *Die Fitnessbewegung in Deutschland. Wurzeln, Einflüsse und Entwicklungen*. Schorndorf: Hofmann.
- Eppel, P. (2004). Die Vereinigten Staaten von Amerika. In F. Stadler (Ed.), *Emigration - Exil - Kontinuität: Vol. 2.1. Vertriebene Vernunft II. Emigration und Exil österreichischer Wissenschaft 1930–1940* (S. 986–996). Münster: Lit-Verlag.
- Folkers, A. (Hrsg.). (2014). *Biopolitik. Ein Reader*. Berlin: Suhrkamp.
- Foucault, M. (1993a). Die politische Technologie der Individuen. In M. Foucault, L. H. Martin & M. Bischoff (Eds.), *Technologien des Selbst* (S. 158–186). Frankfurt a. Main: S. Fischer.
- Foucault, M. (1993b). Technologien des Selbst. In M. Foucault, L. H. Martin & M. Bischoff (Eds.), *Technologien des Selbst* (S. 24–62). Frankfurt a. Main: S. Fischer.
- Graf, S. (2013). Leistungsfähig, attraktiv, erfolgreich, jung und gesund: Der fitte Körper in post-fordistischen Verhältnissen. *Body Politics*, (1), 139–157.
- Gilman, S. (2018). *Stand up straight! : A history of posture*. London: Reaktion Books.
- Hartmann-Tews, I. (1996). *Sport für alle!?: Strukturwandel europäischer Sportsysteme im Vergleich: Bundesrepublik Deutschland, Frankreich, Großbritannien*. Schorndorf: Hofmann.
- Hägele, W. (2008). *Sport in moderner Postmoderne. Band 1: Individualisierung und Körperkultur in nationaler Moderne und globaler Postmoderne*. München: Homo-Ludens.
- Hägele, W. (2010). *Sport in moderner Postmoderne. Annäherungen an den >post< modernen Sport*. München: Homo Ludens.
- Holzweber, F. (1971). "Fit durch Sport" - Grundsätzliche Gedanken zur Förderung des Breitensports. *Leibesübungen Leibeserziehung*, 15(6), 128–130.
- Holzweber, F. (1995). "Fit mach mit" – Österreich ist anders. *Spectrum der Sportwissenschaften*, 7(1), 67–79.
- Holzweber, F. (2002). *Die österreichische Bundes-Sportorganisation. Vorgeschichte, Probleme, Erfolge bis 1992. Eine sportgeschichtliche Dokumentation*. Wien: Eigenverl. F. Holzweber.
- Jütting, D. H. & Krüger, M. (Eds.). (2017). *Sport für alle: Idee und Wirklichkeit* (Edition Global-lokale Sportkultur, 31). Münster: Waxmann.
- Kotz, R. (Hrsg.). (1987). *100 Jahre Orthopädie an der Universität Wien*.
- Kraus, H. (1949). The role of therapeutic exercises in the treatment of low back pain. *New York state journal of medicine*, 49(13), 1523.
- Kraus, H., & Hirschland, R. P. (1953). Muscular Fitness and Health. *Journal of the American Association for Health, Physical Education, Recreation*, 17–19.
- Kraus, H., & Hirschland, R. P. (1954). Muscular fitness and orthopaedic disability. *New York state journal of medicine*, 54(2), 212–215.
- Lengwiler, M. & Madarász, J. (Eds.). (2010). *Das präventive Selbst. Eine Kulturgeschichte modernere Gesundheitspolitik*. Bielefeld: transcript.
- McKenzie, S. (2013). *Getting Physical: The Rise of Fitness Culture in America*. Lawrence: University Press of Kansas.

- Marschik, M. (2009). Transformationen der Bewegungskultur. In M. Marschik, R. Müllner, O. Penz & G. Spitaler (Eds.), *Sport Studies. Eine sozial- und kulturwissenschaftliche Einführung* (S. 23–34). Wien: facultas utb.
- Martschukat, J. (2016). The Pursuit of Fitness: Von Freiheit und Leistungsfähigkeit in der Geschichte der USA. *Geschichte und Gesellschaft*, 42, 409–440.
- Müllner, R. (2009). Moderne und Sport. Historische Zugänge zur Formierung des sportlichen Feldes. In M. Marschik, R. Müllner, O. Penz & G. Spitaler (Eds.), *Sport Studies* (S. 35–46). Wien: facultas.wuv.
- Müllner, R. (2014). The Fitness Campaign in Austria in the Early 1970s: A Case Study in the Transformation Process in Post-modern Sports in Central Europe. In ISPHES (Ed.), *ISHPES Congress, Doha: Global Perspectives on Sports and Physical Cultures: From Past to Present* (p. 69). Doha, Qatar.
- Müllner, R. (2017a). Die österreichische Fitnesskampagne zu Beginn der 1970er Jahre: Zur Analyse einer sportpolitischen Intervention im Spätfordismus. In D. H. Jütting, M. Krüger & W. Baumann (Eds.), *Sport für alle. Idee und Wirklichkeit* (Edition Global-lokale Sportkultur, S. 64–82). Münster: Waxmann.
- Müllner, R. (2017b). Self-Improvement In and Through Sports: Cultural-Historical Perspectives. *The International Journal of the History of Sport*, 33(14), 1592–1605.
- Müllner, R. (2018a). "An das letzte Kind und an den letzten Senioren herankommen": Der nationale "FIT-Lauf und FIT-Marsch" als biopolitische Intervention. In M. Marschik, A. Meisinger & R. Müllner (Eds.), *Zeitgeschichte im Kontext. Images des Sports in Österreich. Innensichten und Außenwahrnehmungen* (S. 377–389). Wien: Vienna University Press.
- Müllner, R. (2018b). Sich in Form bringen. Historische Facetten der körperlichen (Selbst-)Verbesserung im und durch Sport seit 1900. In S. Scholl (Ed.), *Körperführung. Historische Perspektiven auf das Verhältnis von Biopolitik und Sport* (S. 41–70). Frankfurt a. Main: Campus-Verlag.
- Norden, G. (1998). Breitensport und Spitzensport vom 19. Jahrhundert bis zur Gegenwart. In E. Bruckmüller & H. Strohmeyer (Hrsg.), *Schriften des Institutes für Österreichkunde. Turnen und Sport in der Geschichte Österreichs* (S. 56–85). Wien: ÖBV Pädagogischer Verlag.
- Rider, T. C., & Witherspoon, K. B. (2018). *Defending the American way of life: Sport, culture, and the Cold War. Sport, culture, and society*. University of Arkansas Press.
- Scholl, S. (Ed.). (2018). *Körperführung: Historische Perspektiven auf das Verhältnis von Biopolitik und Sport*. Frankfurt a. Main: Campus-Verlag.
- Schwartz S. E. B. (2005). *Into the Unknown: The remarkable life of Hans Kraus*. Lincoln, NE: iUniverse.
- Simons, D.G., Travell, J.G. & Simons, K.S. (1999). *Myofascial Pain and Dysfunction. The Trigger Point Manual, Vol 1, Upper Half of Body*, second edition. Philadelphia, Baltimore, New York, London et al.: Lippincot, Williams&Wilkins.
- Skopec, M. (1987). Adolf Lorenz und das Ringen um die Verselbständigung der Orthopädie in Wien. In R. Kotz (Hrsg.), *100 Jahre Orthopädie an der Universität Wien* (S. 1–45).
- Sturm, P. (2013). Als das Rad auf Touren kam: Sportliche Distanzfahrten, touristische Fernfahrten von und nach Wien. In B. Hachleitner, M. Marschik, R. Müllner (Eds.), *Motor bin ich selbst. 200 Jahre Radfahren in Wien* (Wienbibliothek im Rathaus, S. 38–43). Wien: Metroverlag.
- Ullmann, M. (2003). *Hans Spitzzy: Leben und Werk unter besonderer Berücksichtigung seines Beitrages zur Entwicklung der Leibeserziehung in Österreich sowie seiner Rolle als "Pionier der Rehabilitation"*. Unveröff. Diplomarbeit, Universität Wien, Wien.
- Weber, S., & Kraus, H. (1949). Passive and active stretching of muscles; spring stretch and control group. *The Physical therapy review*, 29(9), 407–410.