GEWICHTHEBEN – WAS KÖNNEN ANDERE SPORTARTEN DAVON PROFITIEREN?

Was erwartet Sie heute?

Behauptung: Gewichtheben ist ein Mittel zur Verbesserung von Sprint- und Sprungleistungen

Indizien:

- Einflußfaktoren auf Sprint und Sprung
- Studien dazu
- Warum gerade Gewichtheben?
- Warum geht es manchmal dennoch nicht?
- Auswege und Abkürzungen

Gewichtheber weisen im Vergleich mit anderen Sportarten überlegene Sprungleistungen auf.

Gewichtheberübungen werden aus diesem Grund in zahlreichen anderen Sportarten als Inhalte des Schnellkraft-trainings eingesetzt.

Wir versuchen, diese Entscheidung rational zu begründen und auf wesentliche Vorbedingungen hinzuweisen.

Anekdoten

Tommy KONO:

"At 5'6 I used to stand bare feet under a basketball rim and jump and touch the rim to win bets. I used no running start but just a quick squat down while swinging my right arm upwards and touching the rim. For the basketball players of 6'2 this is nothing but for someone my height jumping 10 ft. high is proof that lifting improved my vertical jump. I was adept at the long jump too."

Anekdoten

In Bob Hoffmans book "Better Athletes" (1950's?), he claimed that on a ship to the Olympic Games (48 or 52 maybe), the weighlifters challenged all comers to a sprint (distance unknown). He said that the lifters were faster than all but the Sprinters.

Philipp Foster: Standweitsprung 3,14 m (Trencin, Trainingslager)

Video: Shane Hamman

Fakt oder Fiktion?

Jeder Krämer lobt seine Ware.

Anekdoten sind keine zuverlässige Quelle!

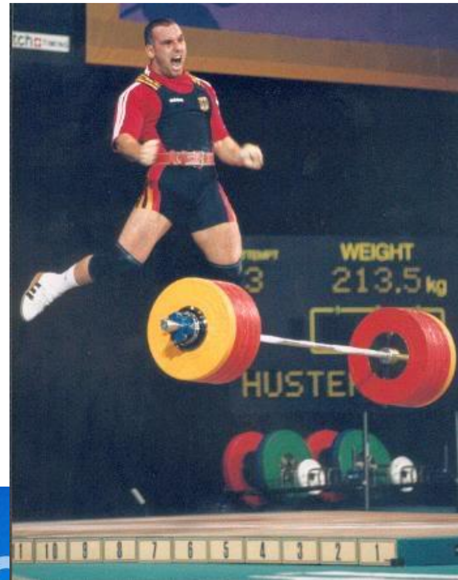
Urbane Legende – eine Untersuchung, die nie stattgefunden hat

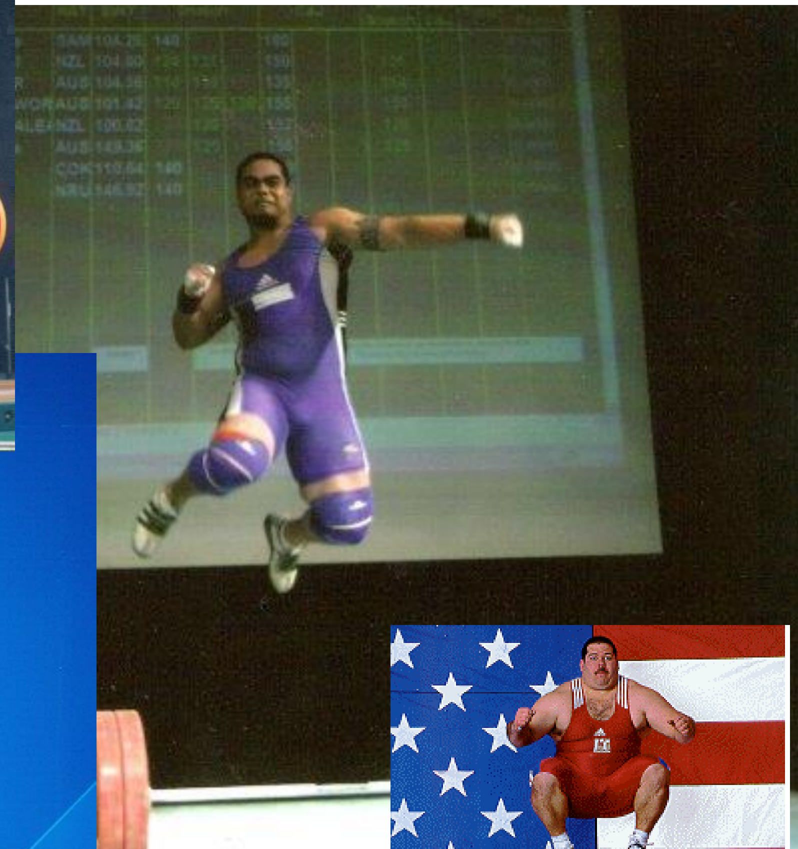
Olympische Spiele 1964 oder 1968

Sprinter vs. Gewichtheber

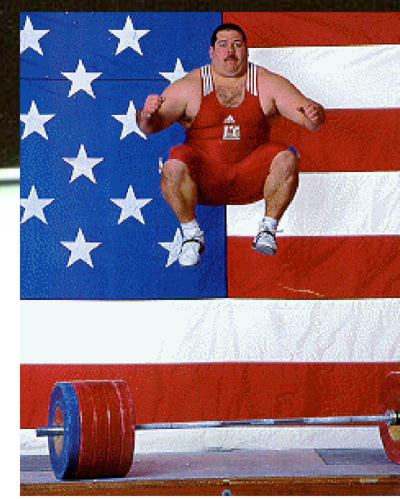
Dr. M. Yessis (1932 -)


YMCA


WEIGHT
213.5 kg




London 2012
London 2012
London 2012



Myth

Weightlifting makes you tight and slow

Sprung = Sprung?

Hochsprung und Weitsprung sind verschieden:

Dowell und Lee (1991): r = 0,62

Dowell LJ, Lee B: A comparison of the effect of transferring momentum from the part to the whole in the verticaljump and the standing long jump. ISBS - Conference Proceedings Archive, 9 International Symposium on Biomechanics in Sports (1991). Download von http://w4.ub.uni-konstanz.de/cpa/article/view/2608Dowell LJ, Lee B: A comparison of the effect of transferring momentum from the part to the whole in the verticaljump and the standing long jump. ISBS - Conference Proceedings Archive, 9 International Symposium on Biomechanics in Sports (1991). Download von http://w4.ub.uni-konstanz.de/cpa/article/view/2608

Table 3: The work outputs of individual muscles

	Muscle Work (J)		
	HJ	VJ	Δ
ILIOP	36.9	2.0	34.9
GMAXI	49.1	47.9	1.2
GMEDI	7.9	7.7	0.3
GMINI	-4.0	4.5	-8.5
ADDLO	2.1	11.5	-9.4
ADDMA	9.8	9.1	0.7
ADDBR	-4.0	2.5	-6.5
HEXRO	5.3	19.3	-14.1
RECTF	14.1	14.4	-0.3
HAMST	-4.8	10.2	-15.1
VASTI	132.3	134.8	-2.5
BFESH	-1.5	0.3	-1.8
GASTR	29.1	32.0	-2.9
TIBAN	2.6	-0.5	3.1
SOLEU	30.6	28.6	2.0
OPFLE	51.9	51.4	0.5

The added values for two legs (two contralateral muscles) are shown. HJ: Horizontal jumping. VJ: Vertical jumping. Δ: The difference between the values for the horizontal jumping and the vertical jumping.

Warum?

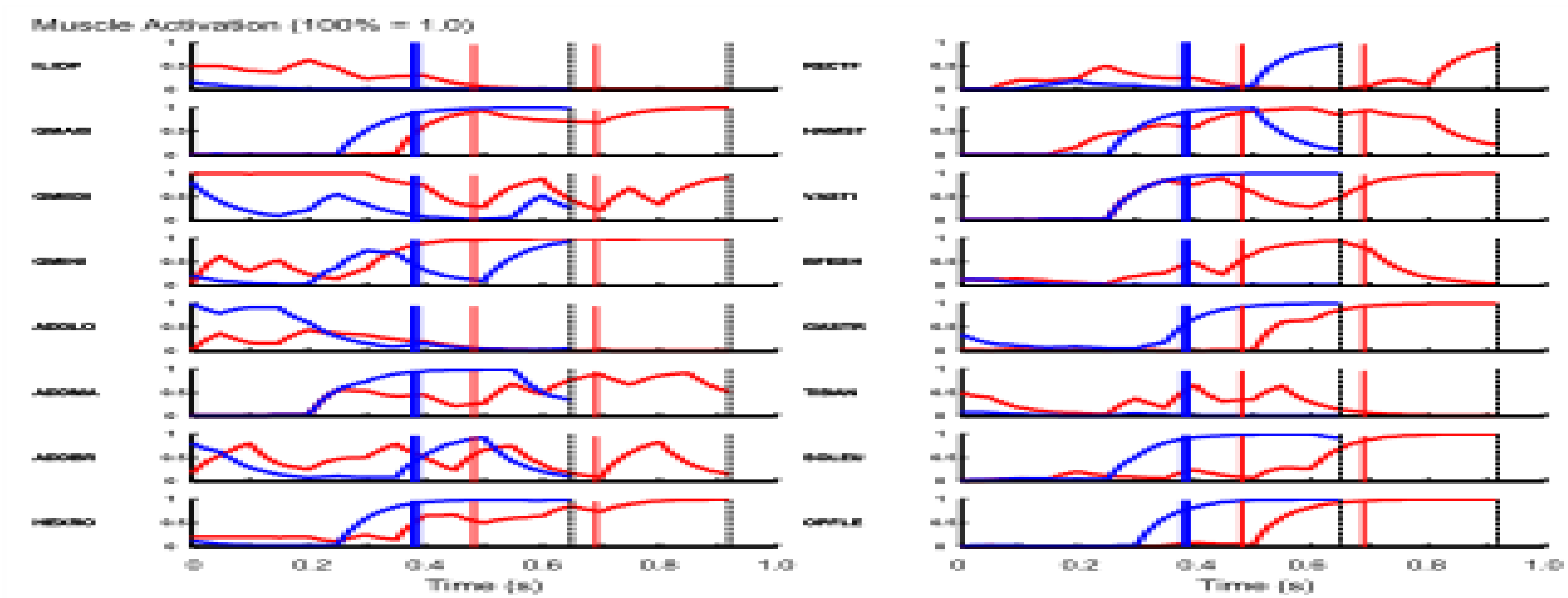


Figure 4
The profiles of the muscle activation. The red curves represent the profiles for the horizontal jumping. The blue curves represent the profiles for the vertical jumping. The dashed vertical lines represent the instant of take-off. The thin red and blue lines correspond to the instances when the hip and knee joints attained the peak flexion values (Figure 3).

Optimal coordination of maximal-effort horizontal and vertical jump motions – a computer simulation study. Akinori Nagano, **Taku Komura** and **Senshi Fukashiro.**

BioMedical Engineering OnLine 2007, **6**:20 **doi:10.1186/1475-925X-6-20**

Standhoch

Hatze: Untersuchung an der Uni Wien

Standhoch mit Kraftmeßplatte

errechnete Werte

„Allgemeine Bewegungslehre“ Skriptum (Version von Kathrin Polzer, Herbst 2002, S. 50).

Sprungleistungen VJ

Sportart	Standsprung-höhe (m)	Maximale Sprungleistung W/kg Masse	Maximale Sprungbeschleunig-ung m/s^2	Absprungzeit (s)
Gewichtheber	0,529	65,2	19,10	0,278
Sprinter	0,510	68,2	22,51	0,216
Volleyball	0,422	55,0	14,27	0,301
Handball	0,366	52,42		0,249
Tennis (Jugend)	0,353	51,3		0,282
Tischtennis	0,331	46,45		

Tab. 1: Sprungwerte verschiedener Sportler. Werte, die in der Tabelle nicht angeführt sind, fehlen in der Quelle. (Polzer 2002)

Sprungdaten

- A.V. Chernyak (1971): „Meister des Sports"

Weight-lifter's Quali-fication	Ver. Jump (cm)	Stand. Long Jump (m)	Stand. Triple Jump (m)	Five Jumps (m)	30 m Run	60 m Run
Novice	57±8	2.34±0.15	6.6±0.4	12±0,5		
Class III	60±10	2.43±0.17	6.9±0.5	12.5±0.8		
Class II	64±10	2.52±0.12	7.2±0.6	13±0.06	5±1	8±1
Class I	68±10	2.6±0.15	7.4±0.7	13.5±0.8		
Master of Sport	72±6	2.7±0.2	7.7±0.6	14±0.8		

Die Fähigkeit, hoch springen zu können, ist in vielen Sportarten entscheidend.

Der höchste Sprung ist der beste!

Die Frage ist …

…entwickelt Gewichtheben die Schnelligkeit oder sind gute Gewichtheber

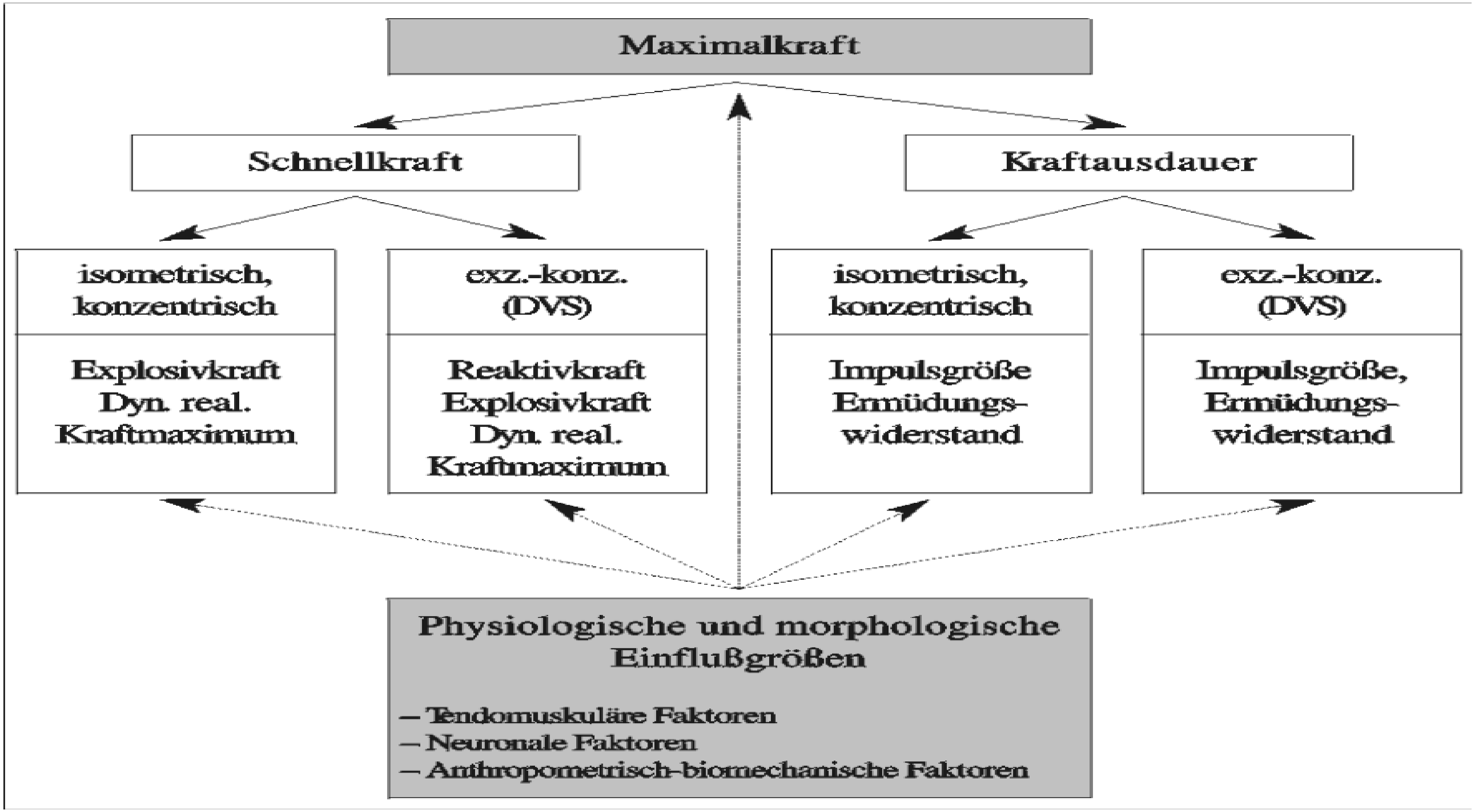
schon vorher

schnell?

Faktoren, die die Sprungleistung beeinflussen

- Maximalkraft („Motor“)
- Rumpfstabilisation (Kraftübertragung)
- Koordination („Technik“)

Strukturmodell (Schmidtbleicher 1999)



Maximalkraft – wozu???

Br J Sports Med *2004;**38:**285-288 doi:10.1136/bjsm.2002.002071*

Strong correlation of maximal squat strength with sprint performance and vertical jump height in elite soccer players. **U Wisløff, C Castagna, J Helgerud, R Jones, J Hoff**

Abstract

Background: A high level of strength is inherent in elite soccer play, but the relation between maximal strength and sprint and jumping performance has not been studied thoroughly.

Objective: To determine whether maximal strength correlates with sprint and vertical jump height in elite male soccer players.

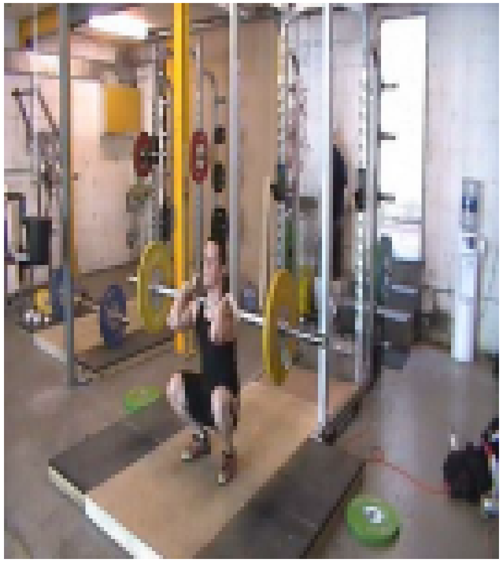
Methods: Seventeen international male soccer players (mean (SD) age 25.8 (2.9) years, height 177.3 (4.1) cm, weight 76.5 (7.6) kg, and maximal oxygen uptake 65.7 (4.3) ml/kg/min) were tested for maximal strength in half squats and sprinting ability (0–30 m and 10 m shuttle run sprint) and vertical jumping height.

Result: There was a strong correlation between maximal strength in half squats and sprint performance and jumping height.

Conclusions: Maximal strength in half squats determines sprint performance and jumping height in high level soccer players. High squat strength did not imply reduced maximal oxygen consumption. Elite soccer players should focus on maximal strength training, with emphasis on maximal mobilisation of concentric movements, which may improve their sprinting and jumping performance.

Squat – How Deep?

- Glute activation during full squats to be greater than twice that of partial squats (35.4% compared to 16.9%), hamstring activation to be similar, while quadriceps activation dominated during the partial squats only. *Caterisano et al 2002*



Understanding that the glutes and hamstrings are the primary hip extensors during sprinting and accelerating is the message from this and other studies (Robertson et al 2008),

PERCENT CONTRIBUTION TO TOTAL ELECTRICAL ACTIVITY DURING THE ASCENT

MUSCLE	QUARTER SQUAT	PARALLEL SQUAT	FULL SQUAT
Biceps femoris	13.37	15.35	15.01
Gluteus maximus	**16.92***	**28.00***	**35.47***
Vastus medialis	30.88	18.85	20.23
Vastus lateralis	38.82	37.79	29.28

**Significant variation*

LEISTUNGSSPORT 42, Sept: 2012, S. 40-46

Hagen Hartmann/Klaus Wirth/Josip Dalic/Markus Klusemann/Claus Matuschek/
Dietmar Schmidtbleicher

Auswirkungen eines periodisierten Maximalkraft-trainings in unterschiedlichen Kniebeugevarianten auf die Schnellkraftleistung im Squat Jump und Counter Movement Jump[1]

Kniebeugentiefe

TAB. 2 Counter Movement Jump

Gruppe	n	T1		T2		%-Differenz	
		$\bar{x}$	s	$\bar{x}$	s	$\bar{x}$	s
FKB	20	38,27	8,37	41,25	8,57	8,29***	6,15
NKB	20	37,45	10,20	40,31	10,90	7,79***	5,43
NKB¹/₄	19	40,99	7,26	40,87	6,90	-0,01	6,77
K	16	35,49	6,55	34,79	4,91	-0,87	9,06

Mittelwert ($\bar{x}$) und Standardabweichung (s) der Sprungleistungen im Counter Movement Jump (in cm) sowie prozentuale Veränderung von Eingangs- zu Ausgangstest

*** = hochsignifikante Veränderung ($p \leq 0{,}001$)

Raastad et al. (2008) stellten nach einem zwölfwöchigen Krafttraining (mittels Magnetresonanztomographie, MRT) fest, dass der Einsatz der parallelen Nackenkniebeuge zu größeren Muskelmassezunahmen des M. quadriceps femoris führt als die Ausführung der Viertel-Nackenkniebeuge bis 110 Grad. Befürworter der tiefen Kniebeuge postulieren, dass der damit einhergehende größere Kräftigungseffekt der Bein- und Hüftextensoren sich positiver auf Schnellkraftleistungen auswirken soll als die

TAB. 3 Squat Jump

Gruppe	n	T1		T2		%-Differenz	
		$\bar{x}$	s	$\bar{x}$	s	$\bar{x}$	s
FKB	20	35,10	8,11	37,32	7,65	7,19***	7,33
NKB	20	34,80	9,55	36,69	9,61	5,83***	6,06
NKB $^1/_4$	19	34,71	6,02	35,36	4,88	2,68	7,75
K	16	30,84	5,83	30,84	4,12	1,38	9,51

Mittelwert ($\bar{x}$) und Standardabweichung (s) der Sprungleistungen im Squat Jump (in cm) sowie prozentuale Veränderung von Eingangs- zu Ausgangstest
*** = hochsignifikante Veränderung ($p \leq 0{,}001$)

Performance of a two-foot vertical jump: What is more important hip or knee dominance?

by

Rupesh Patel

A thesis
presented to the University of Waterloo
in fulfillment of the
thesis requirement for the degree of
Master of Science
in
Kinesiology

Waterloo, Ontario, Canada, 2010

The main observation was that the vertical jump height was positively associated with higher hip than knee work done. However, the within-subject comparisons between the trained hip and knee dominant tasks did not provide additional support for the importance of the hip. Higher hip work appeared associated with greater biceps femoris than gluteus maximus activity. The knee work increased with higher activity of the vastus lateralis and rectus femoris. Finally, higher trunk muscle activity and tighter coupling were associated with the vertical jump height and the max force. This study provides some evidence that encouraging hip dominance together with higher spine stiffness may improve two-foot vertical jump performance. This work has potential implications for training protocols that may be used to improve vertical jump performance.

Rumpfstabilität

J Orthop Sports Phys Ther. 2007 May;37(5):223-31. **The effect of trunk stability training on vertical takeoff velocity.** Butcher SJ, Craven BR, Chilibeck PD, Spink KS, Grona SL, Sprigings EJ.

STUDY DESIGN: Randomized controlled trial with repeated measures.

OBJECTIVES: To determine the effect of trunk stability training on vertical takeoff velocity.

BACKGROUND: Trunk stability training is commonly used in sports training programs; however, the effects of stability training on performance enhancement are not known. Trunk stability training may provide a more stable pelvis and spine from which the leg muscles can generate action, may better link the upper body to the lower body, or may enhance leg muscle activation, thus promoting optimal force production during sporting activities such as a vertical jump.

METHODS AND MEASURES: Fifty-five athletes were randomly assigned to 1 of 4 training groups: trunk stability (TS), leg strength (LS), trunk stability and leg strength (TL), and control (CO). Subjects were tested 3 times: at pretraining, after 3 weeks of training, and after 9 weeks of training. A repeated-measures analysis of covariance (ANCOVA) was used to examine differences among groups for vertical takeoff velocity measured indirectly using a force plate. Pretraining takeoff velocity and body mass were used as covariates.

RESULTS: After 3 and 9 weeks, the training groups were not different from each other. After 9 weeks of training, all 3 training groups had a greater takeoff velocity than the control group ($P<.05$). After 3 weeks of training only the TS group had a greater takeoff velocity than the control group ($P<.05$). Only the TL group increased significantly in vertical takeoff velocity between the third- and ninth-week testing periods ($P<.05$).

CONCLUSIONS: Nine weeks of trunk stability training was similarly effective in enhancing vertical takeoff velocity as leg strength training or the combination of trunk stability and leg strength training. *J Orthop Sports Phys Ther 2007;37(5):223-231. doi:10.2519/jospt.2007.2331*

KEY WORDS: athletic performance, core stability, neural control, vertical jump

THE RELATIONSHIP BETWEEN CORE STABILITY AND ATHLETIC PERFORMANCE

HUMBOLDT STATE UNIVERSITY

By

Angela M. Dendas

A Thesis

Presented to

The Faculty of Kinesiology

In Partial Fulfillment of the

Requirements for the Degree

Master of Science

In Kinesiology: Exercise Science

August 2010

Dendas 2010

determine reliability. RESULTS: The 60-s and 30-s maximum sit-up tests and the McGill trunk flexion test best related to athletic performance. The 60-s test was significantly correlated ($p < .05$) with the relative power clean (1.09 ± 0.17; $r = .836$), relative squat (1.64 ± 0.28; $r = .608$), relative bench press (1.24 ± 0.19; $r = .590$), vertical jump height (29.11 ± 3.70 in; $r = .721$), 40-m sprint time (5.26 ± 0.37 s; $r = -.680$), and 20-m sprint time (3.23 ± 0.27 s; $r = -.803$). The MBESTT was only significantly correlated to the absolute bench press (139.64 ± 18.55 kg; $r = .496$). There were no significant correlations

Koordination

Den Einfluss der Koordination zeigen Simulationsstudien wie Prokopow 2005 oder schon früher Bobbert et al. 1994

The Effects of Muscle Strengthening on Neuro-Musculo-Skeletal Dynamics in A Squat Jump: A Simulation Study

Prokopow, Przemyslaw

Institute of Physical and Chemical Research, Wako-shi, Japan1

Quellenangabe: . Band 12, Heft 4, Seiten 307–314, ISSN (Online) 1899-1955, ISSN (Print) 1732-3991, DOI: 10.2478/v10038-011-0034-6, December 2011

In most of the trials, an adjustment of muscle control was essential in increasing jump height after muscle strengthening. The most important was the adjustment of control of the hamstrings and mm. vasti. When such control was not adjusted, jump height in fact declined by 3.85 cm and 1.60 cm respectively when strength was increased by 20%. When these muscles were strengthened together, jump coordination did not deteriorate as much, but the overall effect on increasing jump height without control adjustment was only +2 mm for 20% stronger muscles, which is a very insignificant amount.

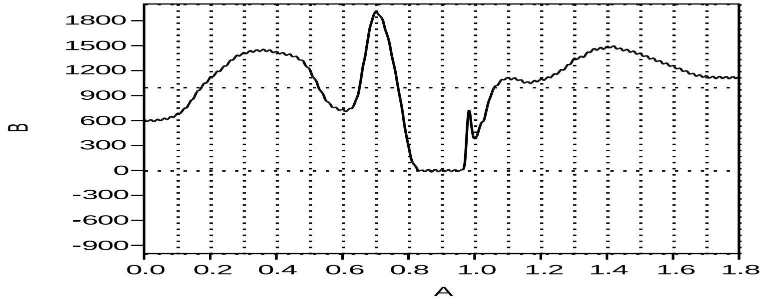
The adjustment pattern of the muscle forces is not only irregular but also compound. It was observed that after strengthening, some muscles developed more force, while others developed a similar amount of force in a shorter time interval, and in the case when all muscles were strengthened, some muscles developed even less force than before strengthening, but their action shifted in time.

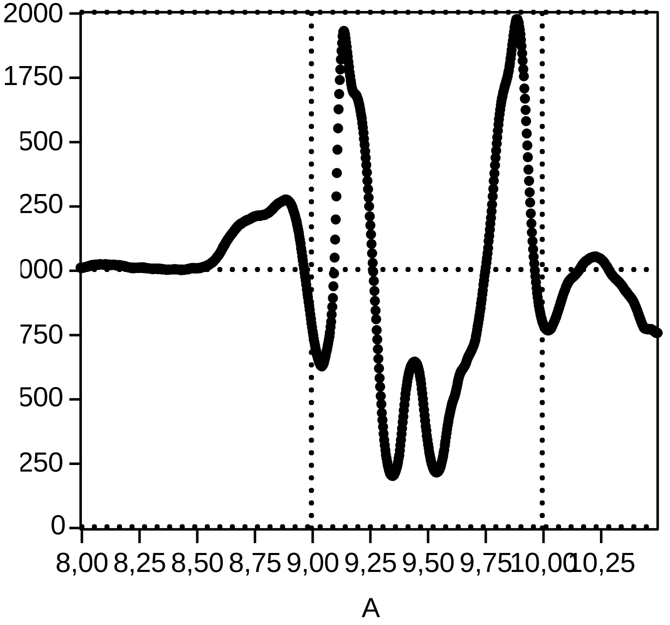
ABSTRACT

BOBBERT, M. F. and A. J. VAN SOEST. Effects of muscle strengthening on vertical jump height: a simulation study. *Med. Sci. Sports Exerc.*, Vol. 26, No. 8, pp. 1012–1020, 1994. In this study the effects of systematic manipulations of control and muscle strength on vertical jump height were investigated. Forward dynamic simulations of vertical squat jumps were performed with a model of the human musculoskeletal system. Model input was STIM(t), stimulation of six lower extremity muscles as function of time; model output was body motion. The model incorporated all features of the musculoskeletal system of human test subjects considered salient for vertical jumping, and the initial body configuration was set equal to that of the test subjects. First, optimal STIM(t) was found for a standard version of the model (experiment A). A satisfactory correspondence was found between simulation results and kinematics, kinetics and electromyograms of the test subjects. Subsequently, optimal STIM(t) for the standard model was used to drive a model with strengthened muscles (experiment B). Jump height was now lower than that found in experiment A. Finally, optimal STIM(t) was found for the model with strengthened muscles (experiment C). Jump height was now higher than that found in experiment A. These results suggest that in order to take full benefit of an increase in muscle strength, control needs to be adapted. It is speculated that in training programs aimed at improving jumping achievement, muscle training exercises should be accompanied by exercises that allow athletes to practice with their changed muscles.

- beim Gewichtheben:
- AL L E S !!

Zugübung und Standhochsprung – dynamische Ähnlichkeit





Ein Vergleich der Bewegungsstruktur des Standhochsprunges und des Reißens zeigt die überaus große Ähnlichkeit sowohl in den auftretenden Muskelaktivitäten (EMG-Messung, Videoanalyse der Winkelgeschwindigkeiten) als auch in den Bodenreaktionskräften (Arabatzi et al. 2009).

ARABATZI, Fotini, KELLIS, Eleftherios, SAÈZ-SAEZ DE VILLARREA,

Eduardo. 2010. Vertical Jump Biomechanics after Plyometric, Weight Lifting, and

Combined (Weight Lifting + Plyometric) Training. Journal of Strength and

Conditioning Research [online]. roč. 24, č. 9, s. 2440-2448 [cit. 2012-04-26]. ISSN

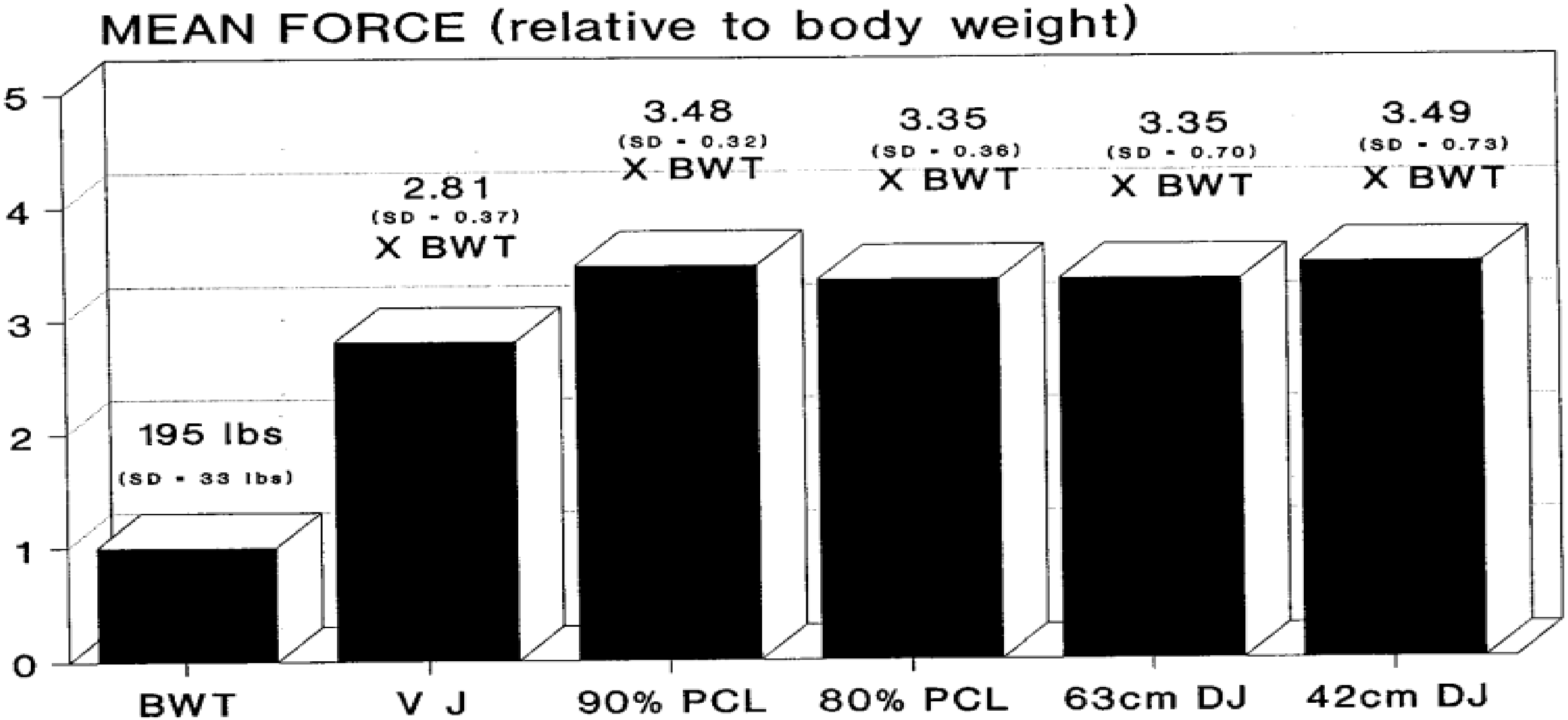
1064-8011.

MAXIMAL IMPACT AND PROPULSION FORCES DURING JUMPING AND EXPLOSIVE LIFTING EXERCISES

E. Burkhardt, B. Barton, J. Garhammer
Biomechanics Lab, Physical Education Department, California State University—Long Beach, Long Beach, California 90840

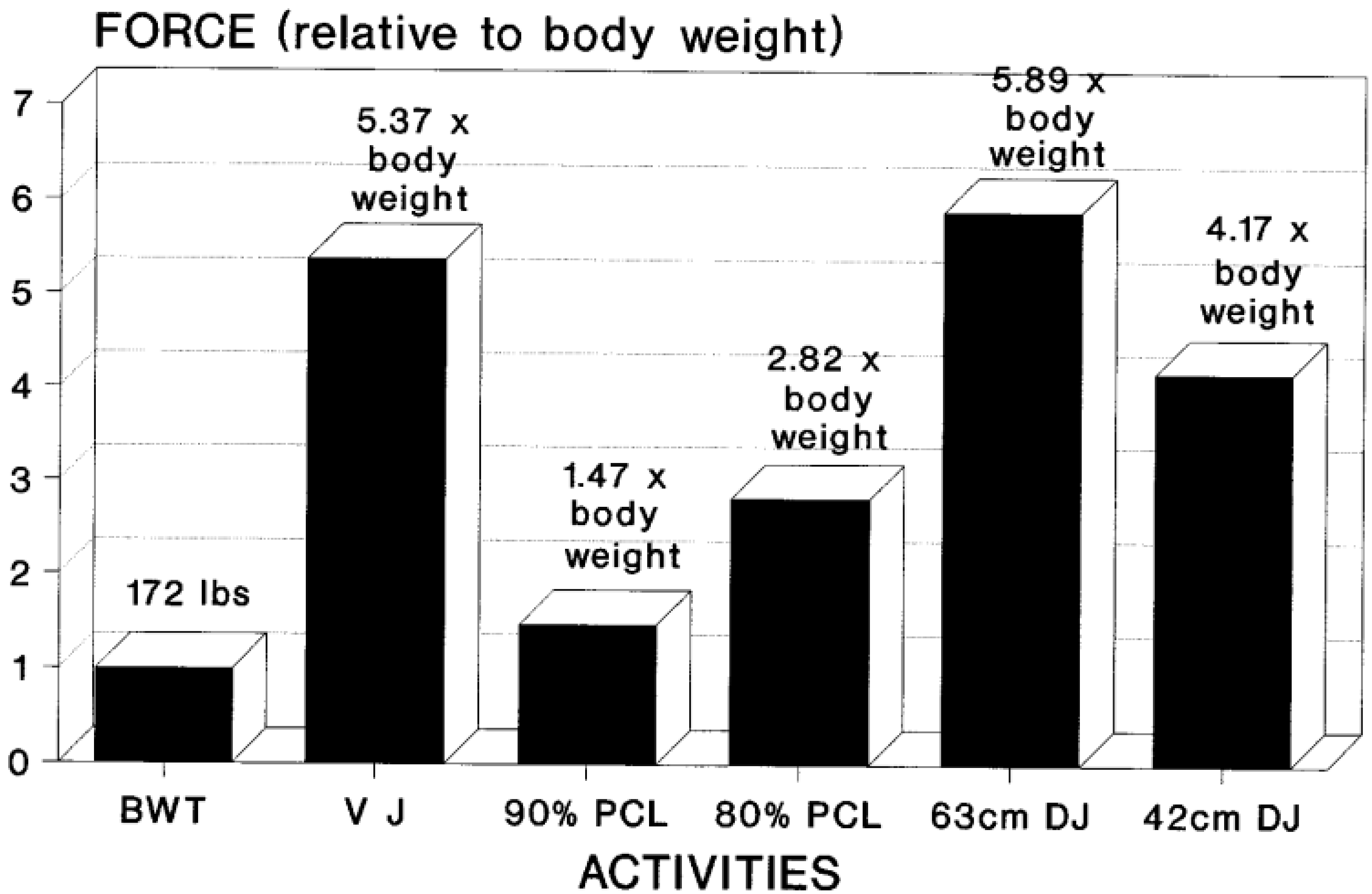
MEAN PEAK PROPULSION GRF

Relative to body weight



PEAK IMPACT GROUND REACTION FORCE

Relative to body weight



Genügt Krafttraining nicht auch?

Der Vergleich macht Sie sicher!

Tricoli V, Lamas L, Carnevale R, Ugrinowitsch C: Short term effects on lower-body functional power development: weightlifting vs. vertical jump training programs. Journal of strength and conditioning research, 2005, 19(2), 433-437.

The purpose of this study was to compare the effects of an Olympic weight lifting (OL), a plyometric (PL), and combined weight lifting + plyometric (WP) training program on vertical jump (VJ) biomechanics. Thirty-six men were assigned randomly to 4 groups: PL group (n = 9), OL group (n = 9), WP group (), and control (C) group (n = 8). The experimental groups trained 3 d.wk, for 8 weeks. Sagital kinematics, VJ height, power, and electromyographic (EMG) activity from rectus femoris (RF) and medial gastrocnemius (GAS) were collected during squat jumping and countermovement jumping (CMJ) before and after training. The results showed that all experimental groups improved VJ height ($p < 0.05$). The OL training improved power and muscle activation during the concentric phase of the CMJ while the subjects used a technique with wider hip and knee angles after training ($p < 0.05$). The PL group subjects did not change their CMJ technique although there was an increase in RF activation and a decrease of GAS activity after training ($p < 0.05$). The WP group displayed a decline in maximal hip angle and a lower activation during the CMJ after training ($p < 0.05$). These results indicate that all training programs are adequate for improving VJ performance. However, the mechanisms for these improvements differ between the 3 training protocols. Olympic weight lifting training might be more appropriate to achieve changes in VJ performance and power in the precompetition period of the training season. Emphasis on the PL exercises should be given when the competition period approaches, whereas the combination of OL and PL exercises may be used in the transition phases from precompetition to the competition period.

Kombinierte Effekte ?

J Strength Cond Res. 2011 Oct 12;: 21997458

OLYMPIC-WEIGHT LIFTING TRAINING CAUSES DIFFERENT KNEE MUSCLE - CO ACTIVATION ADAPTATIONS COMPARED WITH TRADITIONAL WEIGHT TRAINING.

F Arabatzi, E Kellis

Laboratory of Neuromechanics, Department of Physical Education and Sport Science, Aristotle University of Thessaloniki at Serres, Greece.

The purpose of this study was to compare the effects of an Olympic-weight lifting (OL), and traditional weight (TW) training program on muscle- co-activation around the knee joint during vertical jump tests. Twenty six males were assigned randomly to 3 groups: the OL (n=9), the TW (n=9) and Control (C) groups (n=8). The experimental groups trained 3 days a week for eight weeks. Electromyographic (EMG) activity from rectus femoris (RF) and Biceps Femoris (BF), sagital kinematics, vertical stiffness, maximum height and power were collected during squat (SJ), counter movement (CMJ) and drop (DJ), jumping before and after training. Knee muscle co-activation (CI) index was calculated for different phases of each jump by dividing the antagonist EMG activity by the agonist. Analysis of variance showed that the CI recorded during the pre-activation and eccentric phases of all jumps increased in both trainings groups. The OL group showed a higher stiffness and jump height adaptation than the TW group ($P < 0.05$). Further, the OL showed a decrease or maintenance of the CI recorded during propulsion phase of the CMJ and DJs which is in contrast to the increase in the CI observed after TW training ($P < 0.05$). The results indicated that the altered muscle activation patterns about the knee, coupled with changes of leg stiffness differ between the two programs. The OL program improves jump performance via a constant CI while the TW training caused an increased CI, probably to enhance joint stability.

Keywords: train; knee; jump; cmj; knee muscle; lift; muscle; weight train; different knee; stiffness; leg stiffness; emg; adaptation; cause different; group;

Unterschiede?

Hoffman et al. untersuchten die Auswirkungen eines Krafttrainings mit Methoden und Übungen des Gewichthebens einerseits, sowie mit Inhalten des Kraftdreikampfes andererseits auf Maximalkraft- und Schnellkraftleistungen und fanden nach 15 Wochen mit jeweils 4 Trainingseinheiten größere Verbesserungen durch Gewichtheberübungen sowohl in der Kniebeuge als auch im Vertikalsprung und im 40-yard-Sprint.

Hoffman JR, Cooper J, Wendell M, Kang J: Comparison of Olympic vs. traditional power lifting training programs in football players. J Strength Cond Res. 2004 Feb;18(1):129-35.

Meist werden neben den zwei klassischen Wettkampfübungen auch Standübungen (Standreißen, Stand-umsetzen, Standstoß) oder andere Varianten (Reißen oder Umsetzen vom Hang, von Blöcken) sowie fallweise Zugübungen eingesetzt. Alle diese Übungen erzwingen eine explosive Streckung der Knie- und vor allem Hüftgelenke unter Zusatzlast mit fixiertem Rumpf. Dabei werden unter Rückmeldung des Bewegungsergebnisses mehrere Systeme optimiert. Dies ist beim Sprung oder Sprint allein nicht in demselben Ausmaß der Fall.

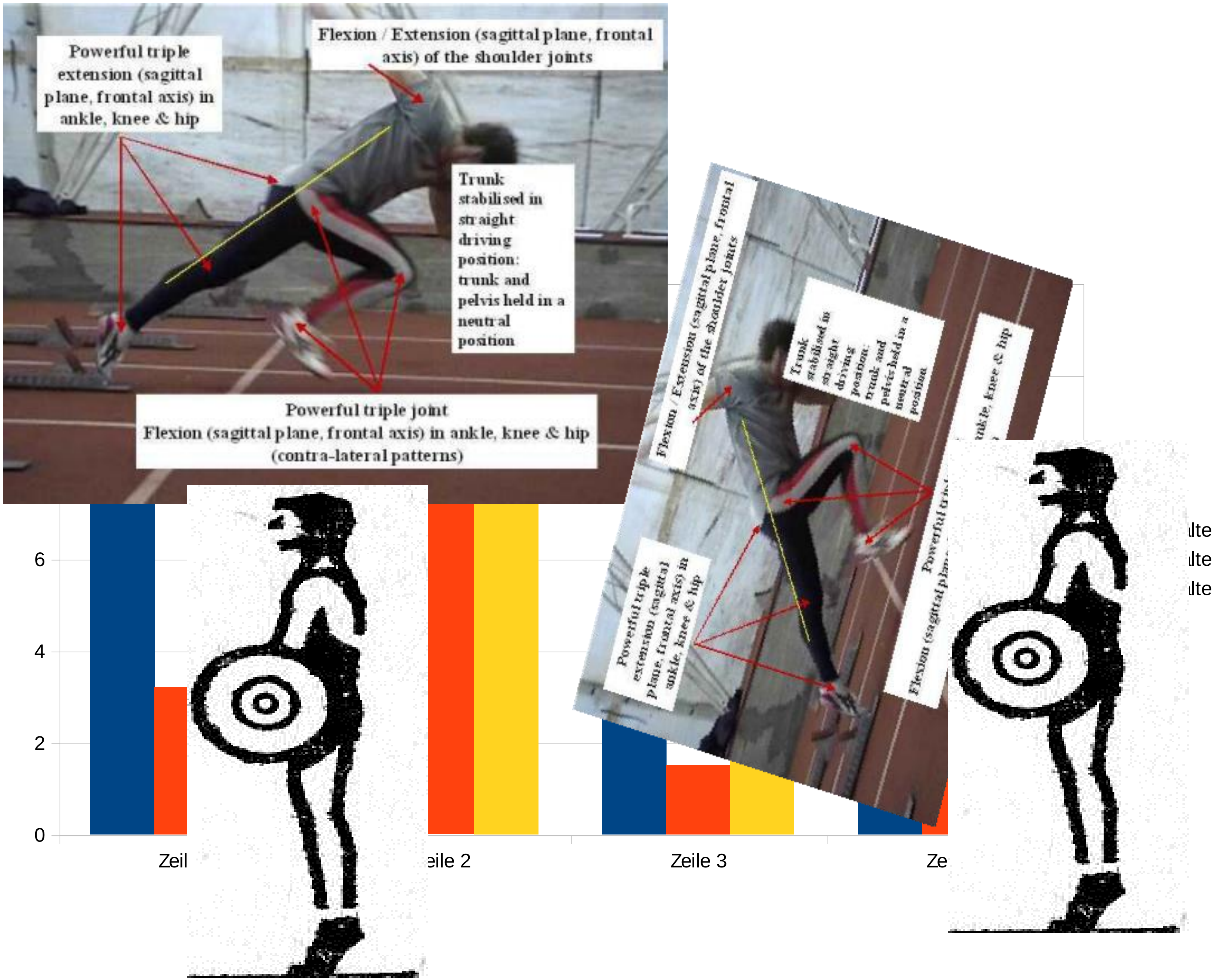
The Olympic Lifts

- The Clean and Jerk
- The Snatch

Modifications of Exercises for sport:

1. Power Clean - Clean
2. Phases of Clean (5 + exercises)
3. Power Snatch - Snatch
4. Phases of Snatch (5 + exercises)
5. Push Press – Split Jerk

- Develop greater **power** and **speed**
- Involves **multiple** muscle groups at once
- High Degree of **co-ordination** required
- Activate high-intra abdominal pressure-**core** conditioning
- Challenge **CNS**
- **Pre**-hab / **Re**-hab
- Demand **stable** scapulae
- Develop **triple** extension


Powerful triple extension (sagittal plane, frontal axis) in ankle, knee & hip
Flexion / Extension (sagittal plane, frontal axis) of the shoulder joints
Trunk stabilised in straight driving position: trunk and pelvis held in a neutral position
Powerful triple joint
Flexion (sagittal plane, frontal axis) in ankle, knee & hip
(contra-lateral patterns)
6
4
2
0
Zeil
eile 2
Zeile 3
Ze
lte 1
lte 2
lte 3

- **One** instance of epiphyseal fracture attributed to weightlifting has been reported in **preadolescents** (Gumbs, 1982).

- In **pubescent** athletes, **five** publications have reported instances of fractures related to weight training (Benton, 1983; Brady, 1982; Gumbs, 1982; Rowe, 1979; Ryan, 1976).

- The overwhelming majority of these injuries were attributed to **improper technique** in the execution of the exercises and **excessive loading**

Warum bleibt manchmal der Erfolg aus?

Martin Zawieja hat sich in einer Reihe von Artikeln im Magazin „Leistungssport“ mit dieser Thematik auseinandergesetzt und macht folgende Punkte verantwortlich:

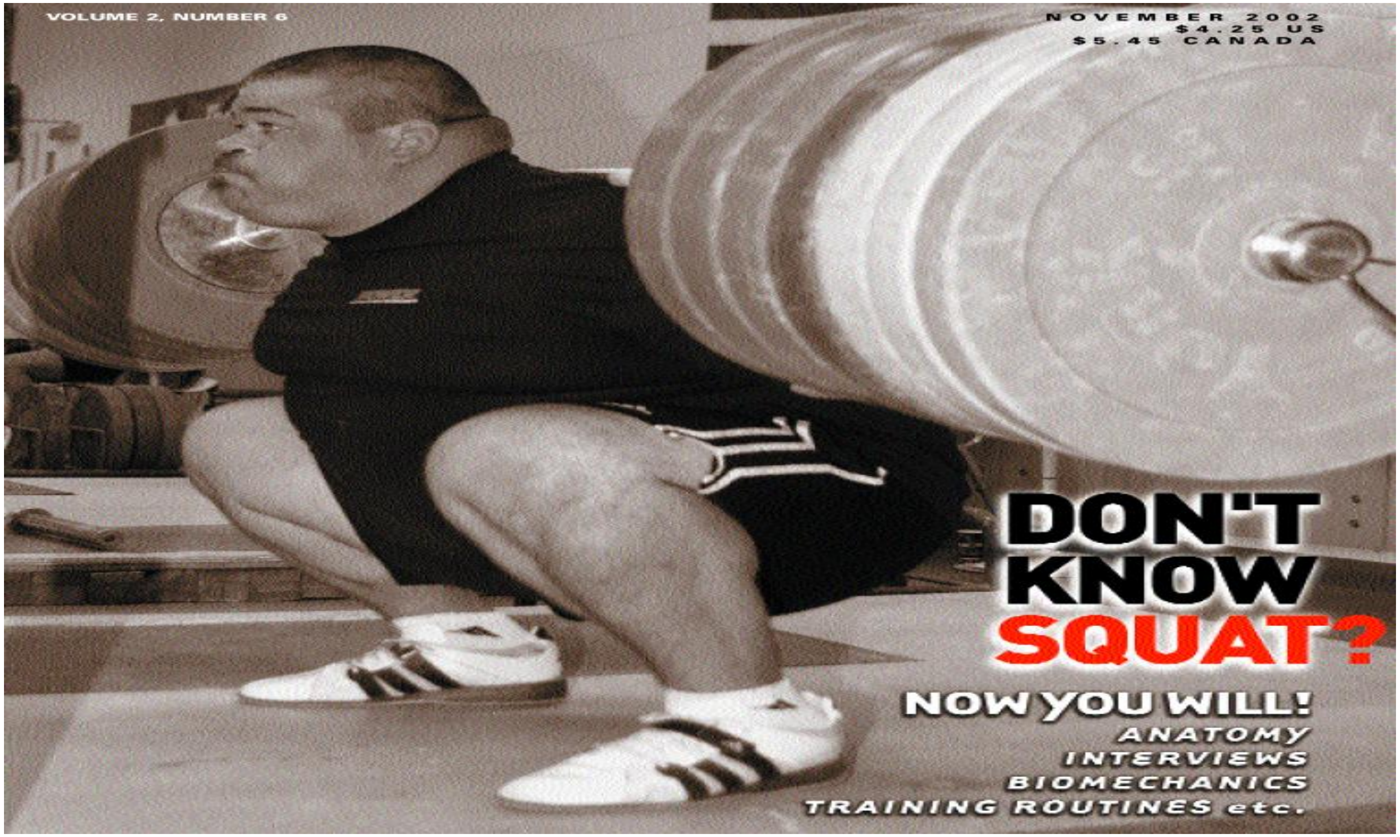
- unterschwellige Belastungen
- WICHTIG: unzureichende körperliche Voraussetzungen!!!
- ungenügender Aufwand zum Erlernen der Technik

Warum funktioniert es manchmal nicht?

Das Erlernen erfordert einen relativ großen Aufwand und ist für Erwachsene meist schwer zu bewerkstelligen!

- Bewegungsmuster
- Falsche Lehrmethode! - Hull
- Beweglichkeit

Körperliche Voraussetzungen?



Beweglichkeit

Häufige Probleme:

Verkürzte Wadenmuskulatur

Verkürzte hamstrings

Lösung:

KNIEBEUGEN, KNIEBEUGEN, KNIEBEUGEN!

Bewegungsmuster

„Ein Gewichtheber lernt einen angemessenen Einsatz der Kräfte des Armes und der Schulter für einen technisch effizienten Stoß, wenn die Arme (relativ) schwach sind und nicht umgekehrt. Das ist der Hauptgrund, weshalb jemand, der zuerst Krafttraining betrieben (und ein hohes Niveau an Arm- und Schulterkraft entwickelt hat), beispielsweise Schwierigkeiten beim Erlernen des Stoßens hat. Diese Athleten haben Probleme, zu erlernen, wie sie die Beine am effizientesten einsetzen und ihnen die zu starken Arme unterzuordnen." (Charniga 2005).

Bewegungskonzepte

Gewichtheben OPTIMIERT Hantelgeschwindigkeit

Die meisten anderen Sportarten MAXIMIEREN Hantelgschwindigkeit

Einige Übungen aus dem Gewichtheberrepertoire sind BESSER geeignet als Reißen oder Stoßen!

Auswege und Abkürzungen

Hauptproblem: Körpersenkung, Hocke, Optimierung =>

Zugübungen (vom Hang, vom Boden)

Teilklassische Übungen (Standreißen, Standumsetzen)

Schwungdrücken

Info / Kontakt

- www.gewichtheben.net
- www.gewichtheben-lehre.at
- http://vkkofi.wbl.sk
- www.kraftdreikampf.at
- www.bannango.com