Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.
A comparison between a traditionally periodised programme and a load autoregulated periodised programme for maximal strength gain in the squat, bench press, and deadlift in weight-trained males

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Jeremy Fraser

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Abstract

**Background:** Training towards the goal of improving maximal strength is commonly undertaken; particularly by athletes involved in contact sports, powerlifters, and recreational body builders. Multiple methods of programming exist, with autoregulated (AR) training being a popular topic within the training community. AR training involves day to day fluctuations in volume and/or intensity in order to accommodate the athlete’s performance on a given day. This could potentially allow for greater gains in strength due to fine tuning of the fatigue-fitness interaction. However, scant research exists on AR training, with the vast majority being carried out on individuals during rehabilitation therapy.

**Aim:** To examine whether a load-autoregulated strength training programme is more effective in improving maximal strength in the squat, bench press, and deadlift than a traditionally periodised program, in experienced weight-trained individuals.

**Methods:** Eight healthy, recreationally trained males agreed to participate and completed this study. Each participant completed a traditionally (TD) programme and an AR programme in a randomised, cross-over design with a 2-week wash out period between. Each programme involved baseline one-repetition-maximum testing (1RM) in the barbell squat, bench press, and deadlift followed by eight weeks of training with subsequent 1RM testing. Following warm up, participants completed one set of as many repetitions as possible (AMRAP) at 85% of baseline 1RM, followed by subsequent working sets. 1RM Prediction equations were utilised in the AR training group to dictate load used in the working sets; whereas the TD groups subsequent sets were based on baseline 1RM.

**Results:** The squat, deadlift, and total improved significantly within each programme (all p<0.05), however no differences between programmes were present (all p>0.05). Bench press strength improvement was significantly greater in the TD programme (time x programme interaction p<0.05).
**Conclusions:** The present study found no differences in effectiveness of programmes at producing strength gain in the squat, deadlift, or total weight lifted. However the TD programme resulted in a greater improvement in bench press strength compared to AR. Future research would also involve auto-regulated volume, as well as ensuring matched cross over design, and ideally a use of more trained participants.
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## Abbreviations

**A**  
AR  Autoregulated  
AKT  Protein kinase B  
AMRAP  As many repetitions as possible

**B**  
BP  Block periodisation  
B1  Baseline testing one  
B2  Baseline testing two

**C**  
CNS  Central nervous system  
CSA  Cross sectional area

**D**  
DUP  Daily undulating periodisation

**E**  
EIMD  Exercise-induced muscle damage  
EMG  Electromyography  
ES  Effect size

**F**  
FP  Foot position  
F1  Final testing one  
F2  Final testing two

**G**  
g  Gravitational acceleration

**H**  
HR  Heart rate

**K**  
kg  Kilograms
LP       Linear periodisation

M       mTOR       Mammalian target of rapamycin

N       NP       Non-periodised

R       RIR       Repetitions in reserve
           RLP       Reverse linear periodisation
           RPE       Rating of perceived exertion

T       TD       Traditionally periodised programme

U       UP       Undulating periodisation

W       WUP       Weekly undulating periodisation
           W1T1      Week one trial one
           W8T1      Week eight trial one

#       1RM       One repetition maximum
           3x10      3 sets of 10 repetitions per set
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