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Technical Report: What is Continuum Zone Repetition on Popular Resistance Training Periodization

Review Article

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Abstract
As resistance training periodization has recently been touted potential plan and program to regime, session, and set-up. The continuum zone repetition has been associated with developing resistance training periodization to develop maximize performance, however it might be more far-reaching as either periodization relationship may be using continuum zone repetition strategy is poorly understood. To determine continuum zone repetition improved resistance training periodization through specific properties periodic repetition strategy. To date, continuum zone repetition on either current resistance training periodization or training regimes are common approach to produce equivocal maximize performance outcomes. Technical report research conducted on two electronic databases like Pubmed and Web of Science. Resolution for disparity due to continuum zone repetition seem to rarely researches. Exploration of the optimize performance relationship is required continuum zone repetition strategy to evaluate maximize strength, hypertrophy, endurance, and power session. Until such studies are completed the efficiency of continuum zone repetition limited in popular resistance training periodization.

Keywords: *continuum zone repetition, periodization, maximize performance*

INTRODUCTION

The popular resistance training periodization enable to proverbial continuum zone repetition strategy uncleared to using volume, load, constant vs unconstant set combination in specific training section as maximal repetition set-up [1]. Other approach for continuum zone repetition specialized training adaptation occurring heavy load strength, moderate load hypertrophy and low load endurance localization [2,3]. Optimize performance outcomes exacuate on continuum dimension of repetition maximum performing low repetition high load (1-5RM) at each set 80-100% strength regime, moderate repetition moderate load (8-12RM) at each set 60-80% hypertrophy regime, high repetition low load (15RM) at each set 60% endurance localization regime [2]. In this condition, one repetition maximum preferred for muscle strength and power at >60% of 1RM and endurance localization <60% of 1RM [2]. Current and traditional progressions adapted on linear resistance training program has not experienced to determine continuum zone repetition strategy [4,5,6]. In this way is perform one seasonal short and long-term periodization to constant vs inconstant set session plan unknown on continuum zone repetition periodization compared on block, daily undulation, weekly model, non-periodic, zone and reverse periodization [2,6,7]. The technical report noted that popular resistance training periodization must be comprehensively continuum zone repetition strategy to strength, hypertrophy, and endurance localization regimes indeed for short term muscular adaptation [2]. However, other common undulation and non-periodic model periodization to exacuate low load incremental set and high

load decremental set are primarily periodization [8, 9]. Without undulation model periodization, similarly load and repetition sessions to detect continuum zone repetition strategy based low and high set x rep known on reverse periodization [10]. Block periodization traditional triple resistance combination performed on constant set and loading volume change [5]. In this similar research noted that constant training intensity and volume enable to strength gain in non-periodic set x rep x load [9,11]. In changeability terminology of low load incremental and high load decremental priority strategy on training set session indeed conducted on undulation model non-periodic periodization [6,7,12]. Undulation model periodization has been planned to reverse periodization on single set change, however, load intensity set preparation is normally constant or changeability repetition maximum determination [6,13]. Constant set and loading variabilities performing undulation periodization set-up change to develop potential strength, hypertrophy and power in non-zone repetition [2,4]. In contrast, undulation model set-up formed on high volume low intensity or low volume high intensity to high strength gain [12]. Undulation periodization compared to linear load variation periodic training section reported similar performance gain, however linear periodizadion initially high-volume low intensity then gradually low volume high intensity [7,9]. In this condition, periodization known traditional as set changes may or may not occur in resistance training, but repetition continuity determined only by intensity [4,6,9]. However, resistance training strategy noted that undulation model periodization to loading non-linear performance gained maximize strength performance [13,14]. Accordingly, linear periodization set-up to knowing reverse intensity change on short time bi-weekly repetition has been related on low and high load combination block periodization [5,12]. As this aim, continuum zone repetition short term periodization used in block periodization [6]. Thus, incremental and decremental set session undetermined to maximize strength through periodic training volume and load unknown as continuum zone repetition resistance training periodization [2,6,7,12]. However, training volume and repetition maximum not aimed to determine single constant vs unconstant set periodization to maximize performance on planning of continuum zone repetition [1,2,3]. The review aimed to determine different periodization of seasonal short and long term used continuum zone repetition strategy to develop maximize performance.

MATERIAL AND METHODS

The review study detected on different periodization by performing standard literature database review. Inclusion criteria formed one section of database to detect proverbial continuum zone repetition strategy using on different periodization relationship. Thus, sport performance studies investigated between 2014-2023. Review literature research was conducted in two electronic databases like Pubmed and Web of Science. To determine continuum zone repetition periodization improved repetition range detection via strength, hypertrophy, endurance localization training section. To date, methodologic resolution in seem due to continuum zone repetition strategy on either repetition range or single intensity are most common approach, which has produced intense performance outcomes.

RESULTS

Continuum zone repetition

Human muscle size and strength adaptation alteration generally focused on various combination constant vs unconsant set and repetition to optimize performance output [15]. In early resistance studies, muscle strength adaptation included designated set (ie, 3 sets) and repetition (ie, 4-8RM) [16]. However, 20 years later, Anderson and Kearney [17] defended his thesis against the low repetition high resistance to develop strength/power and high repetition low resistance to conduct endurance hypothesis of the Delorme classification (1945). The study of their determined on high resistance low repetition (3 set x 6-8RM), moderate resistance moderate repetition (2 set x 15-20RM or 30-40RM) and low resistance high repetition (1 set x 30-40RM or

100-150RM) during long term 9 week and per week 3-day periodization [17]. In this case, this resistance training periodization is knowing “continuum zone repetition” or “repetition training continuum” or “repetition maximum continuum” allowed to repetition counts and different set combination [17,18,19]. Continuum repetition zone periodization used in load and resistance investigated to determine repetition number effects using of resistance training in 6RM or less strength/power and 20RM muscle endurance [18]. Current editorial statement reported that loading recommendation then after optimize performance output obtained to muscle strength repetition (1-5RM), hypertrophy repetition (8-12RM) and endurance localization repetition (+15RM) [2].

Block periodization

Firstly, block periodization has been purposed to macrocycle phases by Verkhoshansky (1970s) in this periodization called triple performance component developing hypertrophy, strength, and power on short week (2-6 week) periodization of Soviet jumpers [20]. Additionally, this periodic model shortly time introduced in North America by Stone 1981 research [6] As Bartolomei et al [6] low set moderate repetition to hypertrophy, low set low repetition to strength/power develops continuum zone periodic maximize performance. In resistance training weekly and constant maximize performance change expected to performing hypertrophy, strength, power development on block periodization [21]. Bartolomei et al [21] full body resistance training primarily hypothesis have been explained on the hypertrophy high set and moderate repetition on short time interval. However, maximum strength session to conduct continuum zone repetition formed low repetition and moderate set and power session on low intense high repetition combined to low repetition and high set. For this research determined that continuum zone repetition was propered maximize strength periodization. Contrastly, block periodization initially high-volume low intensity for maximal strength session then planned to increase training intensity and decreasing volume periodic planning [13]. On this general maximal strength approaches determine modification mesocycle triple training session planning by different volume and intensity reported on hypertrophy moderate set x rep, power high vs low set x rep and explosive low set moderate repetition [13]. In this way, different mesocycle forming of aimed high volume low intensity vs low volume high intensity on macrocycle planned on block phase divided linear (plan: hypertrophy or strength firstly) and non-linear (plan: volume and intensity for each exercise are change) therefore, non-linear has been resembled to macrocycle continuum zone repetition periodic periodization [5]. Bartolomei et al [5] have been reported continuum zone repetition model on general strength using of hypertrophy session at 65-75% of 1RM and 6-10RM, strength session at 80-95% of 1RM and 1-6RM and power session at 50-65% of 1RM and 1-6RM. In these results implied zone repetition on constant macrocycle phase to develop uncommon resistance training phase.

Undulation periodization

Daily periodic training session plans firstly must be undulation periodization to modification volume and intensity set-ups to strength gain included in training frequency various by interval stimuli [13]. In generally, daily undulation resistance training periodized to one unit of block periodization again training experience enhanced on gradually hypertrophy, strength, and power session, however hypertrophy ranges 4-5 sets and 70-80% of 1RM on continuum zone repetition strategy is proper only to hypertrophy development [13]. Sabido et al [13] undulation periodization to gain strength has been applied in. Indeed, strength gain performed on hypertrophy session by performing continuum zone repetition strategy to day-to-day development resistance training periodization. One approach may be to alternate strength and endurance with daily changing periodization [7]. 2015). Franchini et al [7] noted that daily change undulation model to conduct continuum repetition strength zone at 3-5RM and endurance zone at 15-20RM with power exercises similar endurance localization compared block linear periodization. Except for these results showed undulation day to day session change caused to maximal strength increase. Undulation periodization is related on linear and non-linear model to detected volume and intensity by week and month plan [8]. Colquhoun et al [8] explained to linear model produced

high volume low intensity vs low volume high intensity into week contrastly non-linear model volume and intensity similar but training session unit planned on not respectively of zone repetition. In initially weekly training model of macrocycle changed on hypertrophy day (8RM) and strength day (3RM) on 2-4 sets, other progressive weeks differences on hypertrophy day (5-6RM) and strength day (1-5RM) showed on all of continuum zone repetition strategy used to gain strength increase. Accordingly, undulation linear model macrocycle either strength or hypertrophy combination, however non-linear model is constant on strength and hypertrophy volume and intensity [12]. Using of continuum strength zone (1-5RM) to strength gain increase can be use daily undulation model to short term periodization of general strength periodization [7]. In this case, undulation strength and hypertrophic adaptation included specific low volume and low intensity vs high volume low moderate intensity day to day periodization in using continuum zone repetition periodic periodization [9,12].

Weekly undulation periodization

Training regime firstly is known linear constant set stage perform repetition and intensity change to apply as hypertrophy, power, strength week [4]. Zourdos et al [4] daily undulation compared weekly undulation different training regime noted high strength to weekly performance short term periodization without continuum zone repetition strategy. Weekly undulation model is characterized “wave-like” intense distribution to exacuate frequency various of training session from each mesocycle [6]. Bartolomei et al [6] gradual resistance sessions within several weekly performed specific training goal but continuum zone repetition either used or not depending on the purpose of the training. Accordingly, training sessions hypertrophy, strength and power regime and intensity change but sets generally are constant [6]. Antretter, Posch and Burtscher [22] constant set of training of weekly undulation periodization determined that similar strength, hypertrophy, endurance development compared to linear undulation model to weekly efficiency deload reduction training intensity. In this case, deload approach showed on weekly undulation periodization determined on muscle power/mass (4-6RM), muscle mass (12-15RM) and strength/endurance (20-25RM) no performed on continuum zone repetition strategy. However, more frequency and training variable aims can be perform to one weekly constant set to muscular endurance (<12RM), maximal strength (<6RM) and hypertrophy (6-12RM) to develop continuum zone strategy in separate days [23].

Non-periodic periodization

Non-periodized model training regimes explain constant intensity and volume, accordingly if volume and load equated no strength gain between different training sessions [12] De souza et al [12] constant intensity and volume training regimes (plan: 2-3 sets and 8RM) compared to linear and undulating model periodization explained increasing hypertrophic responses. This approach of strength regime similarly continuum zone repetition to maximize hypertrophic responses. Non-periodized model used to develop long term periodic strength and hypertrophic gain used in training regime continuously performed on constant 4 set and volume x intensity 85% of 1RM and 6RM inaccurate continuum zone repetition range. However, constant weekly non-linear model periodization has been progress model to strength gain and no develop strength/endurance [10]. Similarly, neuromuscular strength regimes determined on constant load to maximize short term strength session only traditional repetition at 3 set and 8RM [14]. Fleck et al [1] the constant resistance session different regimes of non-periodized model may be bi-weekly or weekly to similar strength gain compared linear model periodization. Contrastly, Nunes et al [24] supported that meta-progressions on the mesocycle of strength regimes to enhance maximize strength can be non-periodized continuum strength zone (plan: 1-5RM to each constant loading). Therefore, non-periodization model can be used to continuum zone repetition strategy plans on developing of strength adaptation.

Reverse periodization

Reverse periodization is other periodization performing low volume high intensity new approach, however similarly strength gain performed on high volume low intensity [25].

Macrocycle regimes formed on high volume low intensity, subsequently intensities linearly decrease, and volume increase included in strategic is non-linear volume and intensity plan at 4 set and 15RM used to high strength adaptation, then linearly increase repetitions ie., 20RM used to proper strength regimes performing continuum zone repetition [25]. However, non-periodic periodization is combination individual performance to conduct separation reverse periodization compared to traditional high load repetition linear periodization [1].

Table 1. Resistance training periodization

Periodization		
Zone	Non-linear	Rep
Block	Linear	Set
	Non-linear	Rep
		High vs low load
Undulation	Non-linear	Rep
		Set
Weekly undulation	Linear	Set
Non-periodic	Linear vs non-linear	Set
Reverse	Non-linear	Set
		Rep

Table 2. Continuum zone repetition strategy

Authors	**Periodization**	**Type**	**Performance**	**Session**	**Rep**	**Week**	**Output**	**Continuum zone repetition**
Bartolomei et al., 2023	Block	Weekly	Bench press Squat	Hypertrophy Strength Power	Changeable	Ten	10% 6%	YES YES NO
Sabido et al., 2018	Block Undulation	Weekly	Squat	Strength Power Explosive	Unproper	Eight	11% 20%	YES NO NO
Zourdos et al (2016)	Undulation Weekly undulation	Weekly Linear	Squat Bench press Deadlift	Hypertrophy Power Strength	Unproper Maximal	Six	12% 3% 11% +18.18% +21.58% +26.68%	NO
Colquhoun et al., (2017)	Undulation	Weekly Non-linear	Squat Bench press Deadlift	Hypertrophy Strength Power	Changeable Changeable Changeable	Eight	0.001 0.001 0.001	YES
Franchini et al., 2015	Undulation	Weekly Non-linear	Bench press Squat	Strength Power Endurance	Changeable	Eight	+9% +9%	YES
Bartolomei et al., 2014	Block	Weekly Linear	Bench press Squat	Strength Power	Unproper	Eight	8% 6%	YES

Bartolomei et al., 2015	Block Weekly Undulation	Weekly Linear	Bench press Squat Deadlift	Hypertrophy Strength	Changeable Constant	Ten	0.5% 3% 11% 15% 3% 4%	YES NO
De souza et al., 2018	Non-periodic Undulation	Weekly Linear Linear	Back squat Knee extension	Strength	Non-changeable Changeable	Twelve	30% 29% 30%	YES NO
Heilbronn et al., 2020	Non-periodic	Weekly Non-linear	Squat Deadlift Shoulder press Floor press	Strength	Non-changeable	Nine	2% 19% 4% 10%	NO
Ullrich et al., 2016	Undulation	Daily	Squat Knee flexion curl Clean & jerk Snatch Bench press Barbell bench pull Lat pull down	Strength	Changeable	Twelve	20% 5% 1% 3% 7% 5% 3%	NO
Souza et al., 2014	Non-periodic Undulation	Weekly Linear	Squat	Strength	Non-changeable	Six	20% 15%	NO

CONCLUSION

Technical report noted to using of current resistance training periodization and developing strength session. Continuum zone repetition not used on current resistance training periodization model. Furthermore, current strategies unlimited to continuum zone repetition provide developing of training regimes as seasonal of short-term periodization may be support macrocycle and mesocycle, but resistance training periodizations compared to continuum zone repetition has been explained on current literature. Considering this aspect, it may be an opportunity to develop a continuous zone strategy in future research. At the same time, staging repetitions for set and load according to the training purpose is more advantageous in developing optimized performance than other maximize periodizations.

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The data used to support findings of this study are included within the article.

CONFLICTS OF INTEREST

Conflict of interest : Authors state no conflict of interest.

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