The Effects of REBT on Irrational Beliefs, Self-Determined Motivation, and Self-Efficacy in American Football

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Submitted: 19th December 2019

Resubmitted: 22nd March 2020

2nd resubmission: 25th April 2020

Accepted 27th May 2020 in Journal of Sports Science.

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Highlights

- Used an idiographic staggered multiple-baseline across participants design
- Rational self-talk used as part of the intervention
- REBT increased self-determined motivation of the athletes
- REBT increased self-efficacy motivation of the athletes

Abstract

It has been suggested in recent research that rational beliefs as conceptualized within rational-emotive behavior therapy (REBT) can be operationalized as strategic self-talk, but this has yet to be meaningfully investigated. The current study examines the effects of five one-to-one REBT sessions with three amateur American Football athletes to foster rational self-talk. The purpose of the intervention was to reduce the irrational beliefs, but also in line with recent applied REBT research, to increase the self-determined motivation and self-efficacy of the athletes. Using an idiographic single-case, staggered multiple-baseline across participants design, visual analyses revealed meaningful increases in self-determined motivation and self-efficacy, adjunct to decreases in total irrational beliefs across all participants. Social validation data supported these outcomes. These findings add to the growing research indicating that REBT can influence motivational approaches in athletes, such as self-determined motivation and self-efficacy. Results are discussed in relation to processes underlying the mechanisms of change, while also reporting the limitations of the study. The robustness of the research design increases the extent to which target variable changes can be attributed to REBT, but critical reflections are undertaken to assess the veracity of the findings.

Keywords: football; single-case; introjected regulation; CBT; self-statements

The Effects of REBT on Irrational Beliefs, Self-Determined Motivation, and Self-Efficacy in American Football

Rational Emotive Behavior Therapy (REBT; Ellis, 1990) is a cognitive-behavioural approach to psychotherapy (CBT), that is receiving growing interest for its application in sport and exercise settings (Turner & Bennett, 2018). Broadly, in REBT it is one's beliefs regarding events, such as rejection, poor treatment, or failure, that determine subsequent emotional and behavioral responses (Ellis & Dryden, 1997). In REBT, there are two main types of core belief; irrational beliefs and rational beliefs. Irrational beliefs are rigid, extreme, and illogical, whilst rational beliefs are flexible, non-extreme, and logical (DiGiuseppe, Doyle, Dryden, & Backx, 2013).

Extensive research indicates that irrational beliefs are associated with maladaptive affective and behavioural responses (Visla, Fluckiger, Holtforth, & David, 2016), a finding that is echoed in the sport literature (e.g., Turner, Carrington, & Miller, 2019). As such, one of the core goals of REBT is to help individuals reduce their irrational beliefs and increase their rational beliefs. REBT has been applied across a variety of sports, revealing reductions in social anxiety (Turner, Ewen, & Barker, 2018), competitive anxiety (Turner & Barker, 2013), Systolic Blood Pressure (SBP; Wood, Barker, Turner, & Sheffield, 2017), increases in resilience (Deen, Turner, & Wong, 2017), self-efficacy and perceived control (Wood, Barker, & Turner, 2017), vitality and sleep (Davis & Turner, 2019), and performance (Wood et al., 2016; 2017).

Research applying REBT with athletes is growing, and practitioner guidance is readily available (see Turner & Bennett, 2018). In REBT a GABCDE framework (Ellis & Dryden, 1997) guides the work done with athletes. This framework asserts that in pursuit of our goals (G), the adversity we face (A) does not cause emotional and behavioural responses alone (C), rather, it is our beliefs (B) about A that helps determine C. After being identified, irrational

beliefs are rigorously disputed (D) and rational alternative beliefs are developed and reinforced (E; Dryden, 2009). One way that REBT can be operationalized in sport settings is through helping athletes to develop rational self-talk, in place of irrational self-talk. In early research examining the effects of rational and irrational self-talk on performance outcomes, mostly non-athletic participants undertook laboratory-based motor tasks. Studies found that anxiety intensified, and performance declined when irrational self-talk statements were employed in a sequence of trail making tasks (Kombos, Fournet, & Estes, 1989), and a puzzle task (Rosin & Nelson, 1983). Other studies revealed that irrational self-talk impeded behavioral efficiency and performance in a mirror-tracing task (Bonadies & Bass, 1984; Schill, Monroe, Evans, & Ramanaiah, 1978). A recent study in sport (Turner, Kirkham, & Wood, 2018) showed that when athletes used rational self-talk (i.e., self-statements that reflect non-extreme, flexible, and logical beliefs) they performed better in pressured golf putting compared to when they used irrational self-talk (i.e., self-statements that reflect extreme, rigid, and illogical beliefs). In a laboratory setting, researchers (Wood, Turner, Barker, & Higgins, 2017) examined the effects of rational and irrational self-talk on golf putting performance, finding little between-subjects effects on performance. In an applied study (Deen et al., 2017), athletes were encouraged to adopt rational self-talk using the athlete rational resilience credo (ARRC; Turner, 2016b), finding decreases in irrational beliefs and increased self-reported resilient qualities. Clearly, more research is required to more fully examine the applicability of rational self-talk in athletes.

Studies have consistently shown that self-talk can positively affect motivational aspects and self-efficacy in athletes (e.g., Chang et al., 2014; Galanis, Hatzigeorgiadis, Zourbanos, & Theodorakis, 2016; Hatzigeorgiadis, Zourbanos, Goltsios, & Theodorakis, 2008; Kolovelonis, Goudas, & Dermitzaki, 2011; Tod, Hardy, & Oliver, 2011; Vargas-Tonsing, Myers, & Feltz,

2004). By using self-talk, athletes learn to control their cognitions, to direct their focus on relevant stimuli, whilst putting more effort into subsequent tasks (Zinsser, Bunker, & Williams, 2010). Self-talk can be considered as an internal regulation mechanism, capable of affecting cognitive, emotional, and behavioural states (Van Raalte et al., 2016). Thus, based on this premise, and on former research on rational and irrational self-talk (e.g., Turner et al., 2018a; Wood et. al, 2017), integrating personal belief statements into athletes' self-talk might have implications for the regulation of motivationally relevant cognitions, particularly if the content of the irrational beliefs pertains to self-regulation and motivation.

Recent literature on the use of rational and irrational beliefs as self-talk (Turner, Wood, Barker, & Chadha, 2020) shows that the way self-talk can change as a result of REBT is similar to the procedures described in the in reflexive self-talk intervention posited by Latinjak, Hernando-Gimeno, Lorido-Méndez, and Hardy (2019). The GABCDE framework reflects a process of reflexively and meta-cognitively analyzing past self-talk (irrational Bs) and exploring alternate self-talk (rational Bs) to cope with future adversities (As). In addition, when this self-talk is goal-directed, Latinjak et al (2014) suggest that self-talk can be classified in terms of functionality (facilitative/ debilitative) instead of valence (positive/negative). This is important for REBT because the valance of irrational beliefs is not clear, or relevant. For example, the rational beliefs "it is bad to fail, but not awful" is not clearly a positively valenced self-talk statement, but it is functional if the goal is the expression of healthy emotions and adaptive behaviours. Since beliefs are reflective of our deeply held goals and preferences, in REBT more focus is placed on function, than valence. In the current study, we draw on both reflexive and strategic self-talk with participating athletes. Reflexive self-talk intervention procedures are reflected in the REBT work that takes place between the practitioner and the athletes, but the

athlete is then encouraged to develop predetermined self-talk plans for performance situations for motivational instructional purposes (Latinjak et al., 2019).

To gain a better understanding of how rational and irrational beliefs might influence motivational aspects, multidimensional motivation theories should be considered. Specifically, self-determination theory (SDT; Deci & Ryan, 1985) posits that different types of motivation drive individuals to fulfil their objectives. Organismic integration theory (OIT; Ryan & Deci, 2000), which is a sub-theory of SDT, categorizes motivation into six categories, located on the same continuum and ranging from intrinsic motivation (participating in an activity for its own sake) to amotivation (lack of motivation), with integrated, identified, introjected and external regulations residing in between (from more to less self-determined motivation). Extant literature (Turner, 2016) indicates that irrational beliefs are conceptually similar to external motivation, and especially introjected regulation, with behavior being controlled by self-imposed sanctions, such as to avoid shame or guilt (Ryan & Deci, 2002). Hence, if irrational beliefs represent a less self-determined, more controlled, types of motivation (introjected regulation), REBT should have the potential to improve self-determined motivation, as it focuses on disputing and restructuring irrational beliefs. Indeed, Turner and Davis (2018) found that self-determined motivation was increased in triathletes after an REBT education intervention and have subsequently repeated this finding using one-to-one REBT in a multi-participant idiographic case-study design (Davis & Turner, 2019). The potential dual benefits of REBT for reducing irrational beliefs and increasing self-determined motivation is important because behavioral actions that are controlled by external motives and can lead to dysfunctional behavior, such as wanting to, or actually, avoiding or escaping the current situation (Dryden & Branch, 2008; Ryan & Deci, 2002).

Moreover, REBT has the potential to enhance self-efficacy, not only in the academic or occupational context as has been previously demonstrated (Kim, Kim, & Kim, 2015; Warren, 2010), but in the sporting context as well. In one study, after seven one-to-one REBT sessions, a professional archer showed a long-term increase in self-efficacy scores, which has been attributed to the athlete's ability to better control their emotions (Wood et al., 2017). Self-efficacy refers to the belief people have in their abilities to execute a given behavior successfully (Bandura, 1977), and as such, is affected by situational aspects (Bandura, 1986). Bandura suggests that self-efficacy is affected by people's emotional states and therefore, if an athlete can exert control over their emotional state, this would lead to greater perceived control in coping under stressful conditions. In REBT the aim is to help athletes to exert greater control over their beliefs and emotions, and if athletes can manage their beliefs, self-efficacy can be augmented.

Understanding whether and to what extent REBT, through the mechanism of belief change, influences athletes' motivation regulation and self-efficacy is paramount, due to the implications for athletic performance and mental health (Turner, 2016). Therefore, the main aim of the present study is to idiographically examine the effects of one-to-one REBT on the irrational beliefs, self-determined motivation, and self-efficacy of American football athletes. The current study will extend the knowledge base concerning the application of REBT in three main ways. First, for the first time in research we examine the application of strategic self-talk in adjunct to REBT, which could provide a useful method for REBT application with athletes. Second, within the idiographic design we have adopted, we include a one-year maintenance data collection point, that allows us to examine longer-term effects of REBT beyond what has been achieved in past research. Finally, apply REBT with a novel population of athletes, namely American football athletes of German nationality, a sample previously unexamined. To our

knowledge, this is the first time REBT has been applied to German athletes, regardless of their sport, which extends the research of REBT and offers a new approach in other cultures. In line with the corpus of extant literature, it was hypothesized that following the REBT intervention, the athletes would report short- and long-term reductions in irrational beliefs, and increases in self-determined motivation and self-efficacy.

Methods

Participants

Participants were three male German American football players aged 23 (p1), 21 (p2), and 22 (p3) years (M_{age} = 22.0, SD_{age} = 1.0). They had less than four years of experience playing the sport, competing at a regional level, and thus were categorized as amateur athletes (Swann, Moran, & Piggott, 2015). Before commencing the study, the procedure was explained to the coaching staff, who agreed to the project. Informed consent was obtained from participants and university ethical approval was granted prior to the data-collection process.

In line with similar past research (Davis & Turner, 2019), the entire American football squad (n = 25) were screened to determine which participants would take part in the REBT intervention. The screening included the German version of the Sport Motivation Scale-28 (SMS-28; Burtscher, Furtner, Sachse, & Burtscher, 2011), and the German translated version of the irrational Performance Beliefs Inventory-2 (iPBI-2; Turner & Allen, 2018). Scores for each questionnaire were calculated for each athlete and based on their SMS-28 derived self-determination index (SDI), and the composite irrational beliefs scores from the iPBI-2, the final participants were selected. Specifically, individuals who scored higher than the Mean for the squad in irrational beliefs (15.30), and lower than the Mean of the squad in SDI (3.86), were selected for the REBT intervention, because they represented those most in need of the

intervention. The selected participants SDI scores were below the squad mean, and the irrational beliefs scores were above the squad mean (see Table 1). In addition, the selected participants scored above the irrational beliefs norm scores for amateur athletes (M = 15.62; Turner & Allen, 2018). Participants were not screened for self-efficacy, because self-efficacy is rather dependent on situational factors and has the tendency to fluctuate (Bandura, 1986), whereas motivation and irrational beliefs are thought of as more deeply held convictions regarding the self and hence, are more stable and reliable over time.

Measures

Motivation. The SMS-28 (Burtscher et al., 2011; Pelletier et al., 1995) consists of seven subscales and 28-items in total, measuring intrinsic motivation regarding knowledge, accomplishment, and stimulation, identified, introjected, and external regulations, as well as amotivation, using a 7-point Likert-scale from 1 (*does not correspond at all*) to 7 (*corresponds exactly*). The SMS-28 (Pelletier et al., 1995) is widely used to measure motivation in sport (Hu & Bentler, 1999), demonstrating adequate confirmatory factor analysis (alpha reliability between .63 and .80), internal consistency (mean alpha score of .82), moderate to high indices of temporal stability (mean re-test correlation of .69), and internal consistency (was above .70 on all subscales except the 'identified' subscale). In sum, test-retest correlations and construct validity have been shown to be acceptable. Burtscher et al. (2011) found that the German version demonstrates high internal consistency, with Cronbach's alphas ranging from .70 to .85 across the seven subscales. Furthermore, the high correlations between the scores of the subscales for the German and English version evidence an acceptable validity of the German SMS-28. For the current study, in line with past similar research (Turner & Davis, 2018), an index of self-determined motivation (SDI; Vallerand, 2001) was used for all analyses by multiplying each

subscale by an assigned weight in accordance with its' location on the OIT (e.g., Gillet, Vallerand, Amourab, & Baldesb, 2010). A higher score represents more self-determined (or autonomous) motivation and a lower score represents less self-determined (more controlled) motivation.

Irrational beliefs. The iPBI-2 (Turner & Allen, 2018) consists of 20-items which measure four core irrational beliefs, namely demandingness (5-items; e.g., "I have to be viewed favourably by people that matter to me"), awfulizing (5-items; e.g., "It would be awful if my position in my team was not secure"), low-frustration tolerance (5-items; e.g., "I can't stand failing in things that are important to me"), and depreciation (5-items; e.g., "I am a loser if I do not succeed in things that matter to me"), with responses being recorded on a 5-point Likert-scale, from 1 (*strongly disagree*) to 5 (*strongly agree*). The iPBI is a context-specific measure of irrational performance beliefs, with demonstrable construct (alpha reliability between .90 and .96), concurrent (medium to large correlations reported) and predictive (small to medium correlations reported) validity (Turner & Allen, 2018). The iPBI has a good factor structure (RMSEA = .07; CFI = .93; NNFI = .92, SRMR = .06), according to confirmatory factor analysis (Turner, Allen…et al., 2018). The iPBI-2 has also been used with athletes in previous studies using a similar design (idiographic) to the current study (e.g., Turner, Ewen, & Barker, 2018b).

The iPBI-2 was translated into German language in order for participants to accurately complete it. Translation followed guidelines offered by Wild et al. (2005). The first step consisted of the forward translation of the iPBI-2, and for this purpose, the questionnaire was translated independently by two individuals into the target language. For both translators German was their native language. Afterwards, the reconciliation step was carried out, as the two forward translations were merged into one. Subsequently, the reconciled translation was translated back

into the source language by four independent translators, so as to guarantee the quality of the forward translation. For two of the four translators, English was their native language, while the remaining two were speaking English on a sufficient level (at least C1; Council of Europe, 2011). After the back translations were collected, they were reviewed and compared with each other, and with the original iPBI-2, and any misinterpretations were elucidated. Wild et al. (2005) suggested that this step is pivotal in the process of cross-cultural adaptation of questionnaires, in that, any discrepancy leads not only to a reevaluation of the back translated version, but also to a reassessment and potential revision of the reconciled translation. In the end, and as soon as the revision was completed, the questionnaire could be distributed.

Self-efficacy. A self-efficacy scale was developed by the authors in line with Bandura's (2006) guidelines to specifically fit the selected activity domain, as "there is no all-purpose measure of perceived self-efficacy" (p. 307). Hence, items were tailored to particular situations confronted in American football. Athletes were asked to what extent that felt confident to "prevent the opponent from going through the offense line," "score a field goal," and "perform a wide punt." The final version consisted of 17-items, rated on a scale from 0 (*cannot do at all*) to 100 (*highly certain can do*). The scale was developed in German and had to be translated into English, in order to be submitted for ethical review, whereby the same guidelines as before (Wild et al., 2005) were adopted.

Social Validation

Social validation was used to clarify how participants perceived the intervention and whether they thought it helped them deal with adversities. Past research has employed social validation (e.g., Barker & Jones, 2008) in order to determine the effectiveness of interventions as seen by participants (Page & Thelwell, 2013). Participants were asked open-ended questions in a

one-on-one meeting on whether they used REBT and self-talk in months to follow, if it helped them in adverse situations and if so, what exactly it was that felt different after the intervention. Furthermore, during the follow up, they were also asked if they used their self-compiled self-talk throughout the year and whether it helped them in adverse situations or not.

Experimental Design

The study used an idiographic single-case, staggered multiple-baseline across participants design (Barker, McCarthy, Jones, & Moran, 2011; Kazdin, 2011). This design distinguishes the initiation of the intervention by means of comparing it with baseline data, which is acquired before the intervention commences (Hrycaiko & Martin, 1996). Furthermore, greater flexibility is granted in obtaining data, with results being reported separately for each participant (Thelwell & Greenlees, 2001). Participants began the intervention sequentially in a staggered manner, so that changes in target variables could be better ascribed to the intervention rather than to external factors (Kazdin, 1982; Turner & Barker, 2013). The first participant commenced the intervention in the first week, the participant 2 in the second week, and participant 3 in the third week. Barker et al. (2011) suggest that only participants undergoing the intervention should demonstrate change. The order of participation was assigned randomly. Participants completed the self-efficacy scale twice per week for as long as the intervention took place. Additionally, the SMS28 and the iPBI-2 were completed in the 3rd session, one week after the 5th session, at a follow up phase, and at a one-year maintenance phase. Participant 3 did not respond to the request to complete the one-year maintenance phase data collection,

Intervention

Each athlete received five one-to-one REBT session of 30 minutes duration per session. Dose responses have been reported in previous REBT literature (Turner, Slater, & Barker, 2015),

and therefore session-number is an important consideration. Past research has utilized three (e.g., Turner & Barker, 2013), four (e.g., Cunningham & Turner, 2016), five (Davis & Turner, 2019), and six (Turner et al., 2018b) sessions, and Turner and Barker 2014 suggest seven sessions of 30-45-minute length each. All of these lengths are in line with the extant REBT guidelines for brief intervention work (Ellis, Gordan, Neenan, & Palmer, 1997), but five sessions were selected in the current study based on a recent paper that adopted a similar idiographic single-case design targeting similar outcome variables (Davis & Turner, 2019). In line with guidelines (Turner & Barker, 2014) the first session was very flexible, with participants talking freely about what was currently limiting their fulfilment of athletic potential. In the second session, athletes' performance issues were framed within the REBT GABCDE framework, helping the athletes to understand how the adversity (A) they face in pursuit of their goals (G) does not directly cause their emotions and behaviors (C), rather, their beliefs (B) mediate this relationship. The third session helped the athletes to dispute (D) their irrational beliefs. Following disputation, the athletes developed alternative rational beliefs (E), and developed rational self-talk statements with guidance from the practitioner.

The procedures for analysing irrational self-talk and developing rational self-talk in this phase were similar to those of reflexive self-talk interventions. But in the fourth and fifth session, participants refined and practiced using their self-talk statements in a way that is more akin to strategic self-talk. Each participant devised and used a specific behavioral cue, such as grabbing their football helmet or tapping the chest, that would remind them to identify and stop the irrational self-talk they had at that moment and start using their self-developed rational self-talk. Following the fifth session, participants were encouraged to apply self-talk independently up until the follow-up phase, and as a homework task, asked to keep a diary of any adverse

events they encountered. In the diary they were asked to state the situation, their thoughts about the situation, and the self-talk they used, in line with previous self-talk interventions (e.g. Latinjak, Font-Lladó, Zourbanos, & Hatzigeorgiadis, 2016; Latinjak, Hernando-Gimeno, Lorido-Méndez, & Hardy, 2019). The purpose of the diary task was to prompt participants to make habitual the use of rational self-talk when facing and/or faced with adversity. Diaries were reviewed with participants to clarify any difficulties they might have encountered. However, diaries were not included in analysis, as we wanted participants to be as honest as possible in their notes and not withhold information from the practitioner. It was intended to be a cognitive assignment for them, in which they engaged with their beliefs and the corresponding self-talk, in terms of the GABCDE framework (Ellis & Dryden, 1997). As such, consent was not collected from participants and the content of the diaries remained confidential. The practitioner administering the intervention was a postgraduate student with no prior experience in REBT. However, two HCPC registered sport and exercise psychologist, with substantial REBT-training, were supervising the intervention.

Analytic Strategy

Graphed and tabulated data were visually examined for each participant across each dependent variable to assess the effectiveness of REBT. Visual analysis is a common approach in idiographic single-case research designs (e.g., Turner et al., 2018b), and is preferred to statistical analysis, with the practical significance of the data being highlighted over statistical significance (Hrycaiko & Martin, 1996). Furthermore, this kind of study produces limited data-points, which do not warrant the use of statistical tests, due to the underlying assumptions not being met (Ottenbacher, 1986). Hence, this study made use of Hrycaiko and Martin's (1996) criteria for assessment for self-efficacy. These state that, (a) the effect is present in every

participant, (b) change appeared shortly after the intervention was initiated, (c) the baseline and intervention phase show scarcely any overlapping data points, and (d) a relatively big change occurred from baseline. Finally, results were organized according to participant, not variable, so as to conform with the idiographic study design, and to represent the outcome of the visual analysis for each participant in a distinct and clear manner (Thelwell & Greenlees, 2001).

Results

For the results, we include a narrative of data changes across the intervention for each participant separately, in line with the idiographic design we have adopted. It is possible to understand how each athlete responded to the intervention, but overall, the intervention appeared to cause meaningful changes in the target variables, with self-determined motivation and self-efficacy increasing, and irrational beliefs decreasing over the course of the intervention. For self-efficacy, in line with Hrycaiko and Martin's (1996) assessment criteria, the intervention had a positive effect in all participants, with change being present immediately after the onset of the intervention in two participants (participants 1 and 3). Positive change is observed in all participants, with few overlapping data points (26.67% for participant 1, 23.08% for participant 2, and 27.27% for participant 3) from baseline to post-intervention phases (during, post-, and follow-up). Finally, the intervention resulted in substantial change from baseline in all participants, as is evident in the effect sizes recorded for each participant henceforth.

Participant 1

Visual examination of data (see Table 1 and Figure 1) showed a large (d = 3.29) increase in self-efficacy (+53.24%) from screening (M = 51.48) to the one-year maintenance phase (M = 78.89). In addition, self-determined motivation increased (+96.21%) and irrational beliefs decreased (-16.46%) in that same period. For the specific irrational beliefs, LFT increased

(+8.70%), and demandingness (-42.11%), awfulizing (-29.41%), and depreciation (-10.00%) all decreased from screening to one-year maintenance phase.

Self-efficacy continuously increased throughout the course of the intervention, with self-determined motivation increasing up until follow up (+162.25%) and showing a decline in the maintenance phase (-106.09%). The iPBI-2 subscale scores decreased from screening to session 3 (demandingness -36.84%, LFT -8.7%, awfulizing -29.41%), except for depreciation which remained stable. Demandingness continued to decrease from session 3 to post-intervention (-8.33%), with LFT and depreciation remaining stable and awfulizing slightly increasing (+8.33%). From post-intervention to follow-up depreciation decreased (-10.0%), with LFT (+14.29%), demandingness (+45.45%), and awfulizing (+23.08) showing increases in the same time period. At the one-year maintenance phase, demandingness (-31.25%) and awfulizing (-25.00%) both decreased, with depreciation remaining stable and LFT slightly increasing (+4.17%).

Participant 2

Visual examination of data (see Table 1 and Figure 1) revealed a large (d = 2.61) increase in self-efficacy (+12.27%) from screening (M = 73.04) to the one-year maintenance phase (M = 82.00; see Figure 1). Furthermore, self-determined motivation increased (147.81%) and irrational beliefs decreased (-9.33%) throughout the same time period. For specific irrational beliefs, LFT (-9.09%), awfulizing (-15.79%) and depreciation (-13.33%) all decreased, with demandingness remaining stable from screening to maintenance phase.

Self-efficacy continued to increase throughout the intervention phase, while self-determined motivation increased up until post-intervention (+126.09%) but decreased from post-intervention to follow up (-25.00%). One year later, self-determined motivation increased again

(+144.33%). LFT (-4.55%) and awfulizing (-15.79%) decreased from screening to session 3, with depreciation remaining stable and demandingness slightly increasing (+5.26%). From session 3 to post-intervention all variables remained stable, apart from LFT, which continued to decrease (-4.76%). Finally, both demandingness (-15.00%) and depreciation (-13.33%) showed decreases from post-intervention to follow up, with LFT remaining stable and awfulizing slightly increasing (+6.25%). At the maintenance phase, only awfulizing decreased (-5.88%), with LFT and depreciation staying unchanged and demandingness increasing (+11.76%).

Participant 3

For participant 3, we were unable to collect one-year maintenance data. Visual examination of data (see Table 1 and Figure 1) showed a large (d = 0.84) increase in self-efficacy (+8.28%) from screening (M = 59.08) to follow up (M = 61.76; see Figure 1). Self-determined motivation increased (+140.78%) from screening to follow up, while irrational beliefs decreased (-10.96%) in the same time period. For specific irrational beliefs, demandingness (-13.64%), LFT (-10.00%), and depreciation (-30.77%) showed decreases, while awfulizing slightly increased (+5.56%).

Self-efficacy moderately increased from pre-intervention to intervention (+8.33%) but showed a minor decrease from intervention to post-intervention (-.05%). Self-determined motivation increased continuously from screening to post-intervention (+103.67%) to follow up (+1012.12%). Regarding beliefs, all variables but one evidenced small to moderate decreases from screening to session 3 (LFT -5%, demandingness -4.55%, depreciation -15.38%), and from session 3 to post-intervention (LFT -10.53%, demandingness -9.52%, depreciation -9.09%, awfulizing -5.56%), with awfulizing being the only variable that remained stable from screening to session 3. From post-intervention to follow up only depreciation decreased (-10.00%), while

demandingness remained stable, and LFT (+5.88%) and awfulizing (+11.76%) showed increases in that time period.

Social Validation Data

A clear consensus among all participants was that it helped them deal with negative thoughts in difficult situations. For example, “in such events, it is good to know that you have a tool which helps you deal with such thoughts and emotions” (Participant 2), and “I am more relaxed now, because I know I can change my attitude if a difficult situation comes up” (Participant 1). These statements show that participants were better able to self-regulate their thoughts regarding adversity, subsequently feeling more physically relaxed and confident in situations that were previously seen as threatening. Participant 3 said on that matter “I feel better, more confident of myself, when I’m in such a position”. Even after one year, participant 2 stated that “I feel more confident in everything I do”. In general, they claimed that the intervention encouraged them to think differently about adversities and were better able to cope in such events.

Finally, all three participants agreed that after the intervention they felt more self-determined to persist in their attempt to change their thoughts and perform to their best in difficult situations. Participant 3 said, that “now that I have internalized it [REBT], I always try to change my thoughts, so as to perform to the best of my abilities”, while participant 2 stated “now I know how to keep myself motivated, to keep going during a game, as I keep managing my own thoughts”. Overall, they reported that they were contented with the intervention, as it provided them with the means to deal with and adjust their outlook on adversities. In line with SDT (Ryan & Deci, 2002), with more autonomy support, their perceived competence to employ rational self-talk and their persistence to change unpleasant situations increased (Deci & Ryan,

1987). On the contrary, participant 1 said that "there weren't many occasions in which I could use this technique, making it harder to really internalize it", while participant 2 stated that "although I understood the general idea [of REBT], one or two more sessions would be ideal to really learn how to use it". Moreover, both participants 1 and 2 admitted, that their use of rational self-talk statements during this year became more infrequent with time, as they were either "injured and it was not in my mind" (Participant 2), or on the one hand due to "becoming more confident in general" and on the other hand because "it was hard to think about self-talk in difficult situations" (Participant 1). It seems, even though results indicate that participants comprehended REBT and self-talk, more sessions might have further improved the effectiveness of the intervention.

Discussion

The current study used an idiographic single-case staggered multiple-baseline across participants design (Barker et al., 2011; Kazdin, 2011) to examine the effects of REBT and rational self-talk on self-efficacy and self-determined motivation in three amateur American Football athletes. To build methodologically on past research, the present study applied REBT in combination with strategic self-talk. Findings broadly support previous research showing that REBT enhances self-efficacy (Wood et al., 2017) and self-determined motivation (e.g., Davis & Turner, 2019), and aligns with proposals that a link may exist between irrational beliefs and self-determined motivation. Overall, from screening to the final data point (one-year maintenance phase for participants 1 and 2, and follow-up for participant 3), REBT had a positive effect on target variables for all participants. Specifically, visual analysis of data (Hrycaiko & Martin, 1996) showed self-efficacy and self-determined motivation improved while irrational beliefs

declined following the intervention. Social validation corroborated the outcomes of visual analysis.

The current study supports previous findings (Wood et al., 2017), indicating that REBT can improve self-efficacy, as athletes learn to regulate their emotions. The present study also supports the studies by Turner and Davis (2018; Davis & Turner, 2019) which demonstrated that REBT can encourage greater self-determined motivation. The change in self-efficacy is likely due to the focus on REBT on emotional control, since according to Bandura (1977), self-efficacy is meaningfully associated with the emotional state of an individual. The change in self-determined motivation is likely explained by the conceptual similarities between irrational beliefs and external motivation regulation, particularly introjected regulation (Turner, 2016). Also, it has been posited that REBT may enhance the autonomy felt by athletes regarding their emotion and behaviour management (Davis & Turner, 2019). Indeed, participant 2 stated that "now I know how to keep myself motivated, to keep going during a game, as I keep managing my own thoughts", which speaks to the enhancement in perceptions of autonomy following REBT. The integration of self-talk with REBT appeared to help athletes operationalize rational beliefs, and social validation attests somewhat to the utility of rational self-talk. As participants learned to incorporate the GABCDE framework (Ellis & Dryden, 1997) into their training routine and promote their rational beliefs through self-talk statements, they were more capable of controlling their emotions and promoting their rational beliefs, ultimately enhancing their self-efficacy and self-determined motivation.

Although overall the data indicated that target variables changed in the hypothesized directions, results were not uniformly in line with expectations across the study phases. There are points at which irrational beliefs increase from post-intervention to follow up (for two

participants). There are also fluctuations in self-determined motivation across time. Of course, irrational beliefs are not the only contributing factor for motivation and a variety of occurrences could have caused data to fluctuate. However, importantly the athletes reported sustained decreases in irrational beliefs, and sustained increases in self-efficacy and self-determined motivation at the one-year maintenance phase. This is made possible because in REBT the practitioner endeavors to teach the athlete how to use the GABCDE framework independently from the practitioner (Turner, 2019) to the point where the practitioner is redundant (Turner & Barker, 2014). Thus, at the end of the intervention the athlete should be able to apply REBT in an ongoing fashion, which may extend the intervention effects longitudinally. Although athletes appear to endorse lower irrational beliefs at the final timepoint, fluctuation in data across time post-intervention is a feature of the extant research (e.g., Davis & Turner, 2019). Similar to Davis and Turner, the current study also recruited amateur athletes, and perhaps, sudden shifts in target variables could be due to factors outside of the sporting context, to which amateurs must devote meaningful time and energy (such as study or work) compared to elite athletes (Scanlan, Carpenter, Simons, Schmidt, & Keeler, 1993). Whilst REBT sessions were ongoing, irrational beliefs predominantly decreased, with short-term effects still apparent at post-intervention. But from there on, scores either slightly increased or remained stable, with little positive changes occurring in that time period. Of course, post-intervention stability is a laudable and valuable goal for REBT, but further reductions in irrational beliefs is a more progressive goal.

Fluctuation in data can also be explained by inconsistent engagement in homework assignments. Homework assignments in REBT are considered to be very important (Dryden & Branch, 2008), but in the current study participants reported that they did not invest as much time and effort as they could have in practicing their rational self-talk, and neglected to

record their self-talk on occasions. This behavior could be explained by the long-lasting period in which they had to work on their rational self-talk independently. With no guidance between the last session and follow up shortly after and one year later, they might have started to lose interest in the intervention. Post-intervention support is clearly something that practitioners using REBT with athletes should consider, because past research has also reported inconsistent homework adherence (Turner & Barker, 2013). Past research has intimated a dose response (Turner, Slater, & Barker, 2015), and therefore if more sessions are not viable, resources that encourage REBT engagement should be explored (e.g., The Smarter Thinking App; Wood & Turner, 2018).

This study is not without limitations. First, the lack of experience by the practitioner applying REBT and self-talk with athletes has to be mentioned, as this inexperience might have influenced the outcome of the study. According to research, the level of expertise of an instructor or coach plays an important role in achieving greater results in sport (Baker, Horton, Robertson-Wilson, & Wall, 2003). In contrast, a meta-analysis of REBT efficacy (Engels, Garnefski, & Diekstra, 1993) did not find that therapeutic experience was important for successful outcomes. With the use of REBT in sport growing, a debate needs to be had about the level of training required for a neophyte practitioner to apply REBT in athletes. In the current study, the practitioner was supervised by two HCPC registered sport and exercise psychologists who are REBT-trained to primary and advanced practicum levels. Therefore, it is recommended the practitioners formally train in REBT, and obtain suitable professional supervision.

Second, due to the long duration over which the study took place (over one year), the chances of extraneous factors, that were out of our control, affecting target variables was increased. Considering personal life events, especially those that might have occurred during the post-intervention phase and were actually never reported, the interaction of intrapersonal (e.g.,

motivation) and interpersonal (e.g., social support) factors pivotal for athletic behavior are in constant flux (Iso-Ahola, 1995). Therefore, experimental designs should be adopted in future research to conduct studies with tighter controls on extraneous variables with a higher sample size, perhaps building on the laboratory work (e.g., Bonadies & Bass, 1984; Wood et al., 2017) and field work (Turner et al., 2018a) of previous researchers.

Third, as we chose the athletes that needed the intervention the most, in line with our screening method, this could have resulted in the overestimation of the effect found in this study. Furthermore, we exclusively used self-report measures in our study, which might have exaggerated or affected the results, as participants might tend to give socially desirable answers. Fourth, even though participants were taught how to use REBT and self-talk, time-constraints and minimal adherence to the agreed instructions and homework, might have diminished the effectiveness of the intervention. Some reinforcement measures, such as e-mail reminders, could have been installed, so as to prompt participants. Also, future research could collect and use valuable data from any potential homework assignment, such as the diaries in our case, making it clear from the onset of the intervention, that all reported data will be included in the analysis. Also, considering that participants themselves were amateur athletes, dealing with sports generally, and with sport psychological training specifically, might not be their main priority in life and should be considered a limitation to this study. Finally, in the current paper we adopt the terms ‘strategic self-talk’ and ‘reflexive self-talk’ to align our work with contemporary conceptualisations of self-talk (e.g., Latinjak et al., 2019). However, terminology in the self-talk literature is debated (see Van Raalte, Vincent, Dickens, & Brewer, 2019), and readers should consult critical literature to determine the strengths and limitations of the different descriptive terms regarding self-talk.

Conclusion

The present findings support and further extend research, with the adoption of rational self-talk statements and the use of an idiographic multiple-baseline across-participants design. REBT resulted in increased self-determined motivation and self-efficacy, and reduced irrational beliefs. Consequently, practitioners may wish to encourage clients to employ REBT and rational self-talk statements in order to bolster self-efficacy and autonomous motivation. But changes in variables have to be interpreted with care, as REBT should be applied idiosyncratically, leading to non-uniform effects. When utilizing REBT with athletes, especially amateurs, each athlete should be treated as an individual, taking into account wider contextual factors.

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Table 1

All variables across time-points for all participants (percentage changes in parentheses).

	P	Screening	Session 3	Post-REBT	Follow-up	Maintenance	% change screening-last data point
Self-efficacy	1	51.48	52.22 (1.44)[d]	65.67 (25.76)[e]	72.22 (9.97)[c]	78.89 (20.13)	53.24
	2	73.04	76.15 (4.26)[d]	78.81 (3.49)[e]	79.88 (1.36)[c]	82.00 (4.05)	12.27
	3	59.08	64.00 (8.33)[d]	63.97 (-0.05)[e]	61.76 (-3.45)[c]	-	4.54
SDI	1	-17.67	-11.00 (37.75)[a]	1.67 (115.18)[b]	11.00 (558.68)[c]	-0.67 (-106.09)	96.21
	2	-15.33	0.33 (102.15)[a]	4.0 (1112.12)[b]	3.00 (-25.00)[c]	7.33 (144.33)	147.81
	3	-9.00	-2.00 (77.78)[a]	0.33 (116.5)[b]	3.67 (1012.12)[c]	-	140.78
iPBI-2	1	19.75	16.25 (-17.72)[a]	16.25 (0.00)[b]	18.5 (13.85)[c]	16.5 (-10.81)	-16.46
	2	18.75	18.00 (-4.00)[a]	17.75 (-1.39)[b]	16.75 (-5.63)[c]	17.00 (1.49)	-9.33
	3	18.25	17.25 (-5.48)[a]	15.75 (-8.7)[b]	16.25 (3.17)[c]	-	-10.96
DEM	1	19.00	12.00 (-36.84)[a]	11.00 (-8.33)[b]	16.00 (45.45)[c]	11.00 (-31.25)	-42.11
	2	19.00	20.00 (5.26)[a]	20.00 (0.00)[b]	17.00 (-15.00)[c]	19.00 (11.76)	0.00
	3	22.00	21.00 (-4.55)[a]	19.00 (-9.52)[b]	19.00 (0.00)[c]	-	-13.64
LFT	1	23.00	21.00 (-8.7)[a]	21.00 (0.00)[b]	24.00 (14.29)[c]	25.00 (4.17)	8.70
	2	22.00	21.00 (-4.55)[a]	20.00 (-4.76)[b]	20.00 (0.00)[c]	20.00 (0.00)	-9.09
	3	20.00	19.00 (-5.00)[a]	17.00 (-10.53)[b]	18.00 (5.88)[c]	-	-10.00
AWF	1	17.00	12.00 (-29.41)[a]	13.00 (8.33)[b]	16.00 (23.08)[c]	12.00 (-25.00)	-29.41
	2	19.00	16.00 (-15.79)[a]	16.00 (0.00)[b]	17.00 (6.25)[c]	16.00 (-5.88)	-15.79
	3	18.00	18.00 (0.00)[a]	17.00 (-5.56)[b]	19.00 (11.76)[c]	-	5.56
DEP	1	20.00	20.00 (0.00)[a]	20.00 (0.00)[b]	18.00 (-10.00)[c]	18.00 (0.00)	-10.00
	2	15.00	15.00 (0.00)[a]	15.00 (0.00)[b]	13.00 (-13.33)[c]	13.00 (0.00)	-13.33
	3	13.00	11.00 (-15.38)[a]	10.00 (-9.09)[b]	9.00 (-10.00)[c]	-	-30.77

Notes. [a]Screening to Session 3, [b]Session 3 to Post-Intervention, [c]Post-Intervention to Follow-up, [d]Pre-Intervention to Intervention, [e]Intervention to Post-Intervention, [f]Follow-up to Maintenance; P = participant number; DEM = demandingness, AWF = awfulizing, DEP = depreciation.

Figure 1. Graphed self-efficacy data for all participants across baseline, during-REBT, post-REBT, follow-up (Fo-Up), and maintenance (maint) phases.