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**The Effects of Eye Movement Desensitization and
Reprocessing (EMDR) on Prospective Imagery and Anxiety
in Golfers**

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EMDR FOR PROSPECTIVE IMAGERY IN GOLF

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1 **The Effects of Eye Movement Desensitization and Reprocessing (EMDR) on Prospective**
2 **Imagery and Anxiety in Golfers**

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Submitted: 27th February 2017.

EMDR FOR PROSPECTIVE IMAGERY IN GOLF

Abstract

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2 In this study we make a novel contribution by examining the effects of an Eye Movement
3 Desensitization and Reprocessing (EMDR) intervention on detrimental prospective imagery
4 in four amateur golfers, using a single-case multiple-baseline across-participants design.
5 Post-intervention, all participants reported reduced negative imagery effects; participants 1, 3,
6 and 4 showed reduced cognitive anxiety, participants 1 and 4 reduced somatic anxiety, and
7 participant 3 positively relabeled somatic anxiety experiences. Social validation data
8 demonstrated EMDR to be perceived positively and effective in delivering notable changes.
9 Consultancy experiences of using EMDR in golf are discussed and areas for future
10 researchers and applied practitioners outlined.

11
12 **Key words:** Anxiety, single-case methodologies, applied sport psychology, intervention,
13 social validation.

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3 1 **The Effects of Eye Movement Desensitization and Reprocessing (EMDR) on Prospective**
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6 **Imagery and Anxiety in Golfers**

7 3 Memories of traumatic past events have been found to be associated with intrusive images of
8
9 4 feared future experiences in clinical research (Brewin, Gregory, Lipton, & Burgess, 2010),
10
11 5 and in athletes who experienced performance anxiety (Engelhard et al., 2012; Engelhard et
12
13 6 al., 2011). More specifically, research highlights that up to 60% of athletes with performance
14
15 7 anxieties have an inability to stop mental images of poor performance, potentially leading to
16
17 8 reduced self-confidence and increased anxiety symptoms (e.g., Hanton, Mellalieu, & Hall,
18
19 9 2004). Accordingly, exploring the efficacy of techniques seeking to deliver effective control
20
21 10 over prospective negative imagery is important in applied practice and research. Indeed, one
22
23 11 technique which has the potential to positively affect prospective imagery is Eye Movement
24
25 12 Desensitization and Reprocessing (EMDR). Moreover, EMDR is a psychotherapeutic
26
27 13 technique used to address traumatic memories and imagery, with a strong clinical and
28
29 14 research evidence-base in being effective for Post Traumatic Stress Disorder (PTSD),
30
31 15 obsessive compulsive disorder, anxiety, and depression issues (Foa, Keane, Friedman, &
32
33 16 Cohen, 2008).

34
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38 17 In EMDR, situations and triggers linked to past, present and future concerns are
39
40 18 identified, and target symptoms are rated as emotional and physical experiences along with
41
42 19 negative self-referencing statements (Solomon & Shapiro, 2008). Processing involves the
43
44 20 therapist sitting facing and alongside the client, who is asked to watch the therapist's fingers
45
46 21 moving rapidly and rhythmically from side to side across the client's range of eye movement
47
48 22 in sets of 12-24 movements at an approximate frequency of two left-right cycles per second
49
50 23 (Shapiro, 1989). The client is supported in "noticing" experiences during therapy, similar to
51
52 24 the process of mindfulness, aiding development of a sense of mastery and self-efficacy
53
54 25 related to the traumatic incident, with more adaptive interpretations and imagery being
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3 1 reinforced using bilateral eye movements, typically at a slower frequency (Oren & Solomon,
4
5 2 2012).

6
7 3 Two dominant hypotheses have been proposed to explain bilateral stimulation effects
8
9 4 caused by eye movement (Oren & Solomon, 2012). First, eliciting an “orienting response”,
10
11 5 where a reduced arousal neurobiological state, similar to Rapid Eye Movement (REM) sleep,
12
13 6 may cause dysfunctional memories to be linked to more adaptive memory networks
14
15 7 (Stickgold, 2002). Second, dual attention processing might disrupt working memory, with
16
17 8 effects on emotionality of imagery and memory. Both hypotheses have considerable
18
19 9 supporting evidence, and may interactively support the therapeutic effects of EMDR (see
20
21 10 Oren & Solomon, 2012), with symptoms of single incident trauma typically resolving within
22
23 11 2-3 sessions (Shapiro, 2012). Although eye movements are the most commonly delivered
24
25 12 form of bilateral stimulation, hand taps and auditory tones have also been used where clients
26
27 13 are visually impaired or cannot tolerate eye movements.

28
29 14 Underpinning EMDR, Adaptive Information Processing (AIP) theory proposes that
30
31 15 healthy adjustment requires that new experiences are linked with emotions, before being
32
33 16 stored in neural memory networks with associated learning or experience (Solomon &
34
35 17 Shapiro, 2008). Chronically traumatic experiences may remain unprocessed, typically stored
36
37 18 in implicit memory with associated physical sensation and emotional experience isolated
38
39 19 from new learning and influence (Stickgold, 2002). Lying outside conscious control, implicit
40
41 20 memory may be re-activated by experiences, leading to reflexive behavioral responses. For
42
43 21 example, a rugby player who received a crashing tackle on taking the ball from the kick-off,
44
45 22 might experience images of being tackled again, producing anticipatory anxiety and
46
47 23 avoidance of the catch. In EMDR physiologically stored perceptions are processed from
48
49 24 implicit, into episodic, then semantic memory (Solomon & Shapiro, 2008), de-coupling the
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51 25 memory from the emotional distress.
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1 Whilst the majority of EMDR research has reported the efficacy of interventions in
2 retrospective imagery and past trauma, data also reveals EMDR to be effective in prospective
3 imagery. To illustrate, Engelhard et al. (2011) used eye movements in both analogue and
4 field studies to reduce the impact of flash-forwards imagery in student volunteers.
5 Furthermore, in a clinical setting, Romain (2013) reported the use of EMDR in two clients
6 with “flash-forwards”, where despite effective EMDR processing of past trauma, future
7 oriented imagery remained active until processed specifically therefore supporting the need
8 for further study of the role of flash-forwards experiences.

9 The extant literature on EMDR in sport is limited, and thus research, which has been
10 undertaken, has typically explored two main areas. First, EMDR in standard form has been
11 shown to be beneficial for traumatized athletes. For example, female gymnasts with
12 psychological difficulties following injury or falls, or due to “debilitating repetitive thought
13 process”, showed reduced cognitive and somatic anxiety and increased self-confidence after
14 three EMDR sessions, with effects maintained 90-days after the intervention (Arnold, 2004).
15 Similarly, state anxiety and heart rate were reduced after three EMDR sessions in swimmers
16 reporting distressing past swimming experiences (Graham & Robinson, 2007).

17 Second, EMDR has been combined with graded exposure to treat performance blocks,
18 or the “yips” in sport, conceptualizing such difficulties as a form of anxiety (Bennet &
19 Maynard, 2016). Processing memories of painful life events, reframing negative cognitions
20 and reducing anxiety levels in two athletes led to an improved ability to execute the
21 movement required. Similarly, performance enhancement protocols have used EMDR in
22 business and sport (Foster, 2012; Foster & Lendl, 1995; Gracheck, 2011). This form of
23 EMDR places greater emphasis on present performance, goal realization and self-
24 actualization, adopting techniques from the field of sport psychology including goal-setting,
25 arousal control and imagery however to date little empirical exploration exists.

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1 Given sport performance is shaped by a number of related psychological factors,
2 including self-efficacy (Moritz, Feltz, Fahrbach, & Mack, 2000), pre-competition anxiety and
3 the influence of (negative) imagery (e.g., Hanton et al., 2004; Nordin & Cumming, 2005),
4 EMDR has the potential to modify the effects of negative experience(s) and imagery.
5 However, to date no published work exists on the area of future oriented imagery in sport.
6 Therefore, the purpose of this study was to add to the extant literature by exploring the effects
7 of EMDR on negative prospective imagery in a sample of amateur golfers. Based on the
8 extant clinical literature, we hypothesized that a brief series of standard protocol EMDR
9 sessions would alter imagery meaning and effects, and that addressing such imagery would
10 reduce cognitive and somatic anxiety.

Method

Participants

13 Four competitive golfers, who reported experiencing troubling prospective imagery
14 related to their golf, were recruited through local Golf Clubs, and provided informed consent.
15 Typical imagery issues included a picture of a particular shot repeatedly going into trees at a
16 narrowing of the course, or the golfer being ridiculed by other golfers for hitting a poor drive.
17 Participants were aged 15- 62 ($M = 44.5$; $SD = 20.4$), playing experience ranged from 9-42
18 years ($M = 26.25$; $SD = 17.17$), with handicaps between 3 and 14 ($M = 6.5$; $SD = 3.87$), two
19 with experience at Interprovincial competition (approximately Interstate, or Regional
20 representation).

Experimental Design

22 A single-subject, multiple-baseline across-participants design was used (Barker,
23 McCarthy, Jones, & Moran, 2011). The baseline phase lasted until the first of three EMDR
24 sessions began (range 9-32 days; $M = 18.25$; $SD = 10.56$). The intervention and follow-up
25 phases lasted 18-55 days ($M = 39.75$; $SD = 15.90$). Data collection included 4-7 baseline

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3 1 phase competition measures ($M = 5$; $SD = 1.41$) and 5-7 intervention phase measures ($M =$
4
5 2 5.75 ; $SD = 0.96$) across the four participants.

3 **Measures**

4 Participants were instructed to complete the study measures (typically taking no more
5 than 10-minutes) 45-60 minutes prior to play, without referring to previous scores,
6 considering only how they felt at that time.

7 **The Competitive State Anxiety Inventory-2R (CSAI-2R).** The CSAI-2R has
8 shown a good fit with the factors of somatic and cognitive anxiety, and positively worded
9 self-confidence (Cox, Martens & Russell, 2003), stronger psychometric properties than
10 previous versions (CFI = .95, NNFI = .94, RMSEA = .054) and acceptable internal
11 consistency (Cognitive Anxiety $\alpha = .75$; Somatic Anxiety $\alpha = .85$; Cox et al., 2008).

12 **Impact of Future Events Scale (IFES).** The IFES measures the impact of
13 prospective negative imagery, associated avoidance and hyper-arousal (Deepröse & Holmes,
14 2010). In dysphoric participants, the IFES has shown significant relationships between mood
15 scores and the importance of prospective imagery. The measure requires participants to
16 identify three future events (either positive or negative) they have been thinking about over
17 the previous 7 days, to encourage a focus on personally meaningful issues, then a rating of 24
18 statements about the imagined future events (such as “I believed my thoughts about the future
19 would definitely happen and would become real”), on a 5-point scale from “Not at all” (0), to
20 Extremely (5; Deepröse, Malik, & Holmes, 2011). The IFES has delivered an acceptable
21 test-retest reliability co-efficient of $r = .73$, $p < .001$, $n = 48$. Internal consistency of the IFES
22 Total Score yielded a Cronbach’s alpha = 0.87 (reported as good), indicating that scale items
23 are measuring the same construct, intrusive prospective imagery (Deepröse et al., 2011).

24 **Social Validation Questionnaire.** The social significance of an intervention will be
25 reflected in the value and acceptability of goals, procedures and effects for clients and

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1 significant others supporting them (Page & Thelwell, 2013). Social validation measures are
2 typically used in single case research to understand participants' experiences. Therefore, 6-8
3 weeks after data recording, a 16 item on-line questionnaire (available from the first author)
4 explored the impact of negative imagery on participants' golf game and self-confidence; the
5 ease of completion of questionnaires; impact and perceived value of the EMDR intervention,
6 and whether EMDR contributed to any change in performance. Two additional open
7 response questions examined participants' experiences of EMDR, and general comments on
8 the research process. The questionnaire was administered using a proprietary on-line survey
9 tool.

10 **Intervention**

11 Following university ethical approval, informed consent (and Assent from one minor),
12 a mental health history and screening interview was undertaken with volunteers by the lead
13 author (a UK accredited psychiatrist). The screening interview took place to ensure first that
14 prospective negative imagery had a perceived substantial negative impact on their game,
15 causing anxiety-related symptoms, and second that none of the candidates had a history of
16 significant personal trauma, nor met criteria for current mental health diagnosis. The lead
17 author has undertaken Level I and II EMDR training in the UK, and has an array of
18 experiences in clinical psychiatry. In keeping with single-case methodology in sport
19 psychology (see Barker et al., 2011), once baseline results showed relative consistency or a
20 negative trend (e.g., worsening imagery or anxiety), three EMDR sessions were delivered at
21 weekly intervals. During the first session, the participant was guided through the "safe place"
22 procedure (named as "control place" for the athlete), to ensure that in the event of any
23 unexpected trauma or dissociative response occurring, the participant had a safe way of
24 dealing with this. Each participant was asked to identify specific problematic prospective
25 imagery, which was then processed according to EMDR protocol, beginning with processing

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1 of any previous “trauma” or triggers, before the prospective imagery itself was processed. In
2
3 session, ratings were taken of Subjective Units of Distress (SUDS) related to the problem
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5 imagery, to ensure first that the target imagery was significant enough to merit intervention,
6
7 and second to monitor responses to EMDR. Typically, SUDS will move from 7-8/10 to 2-
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9 3/10 or lower. Similarly, Views of Cognition (VoC), rating belief in an alternative desirable
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11 positive cognition was used to ensure that negative beliefs were replaced with more adaptive
12
13 ones. In session ratings did not contribute to formal analysis. Participants were then asked to
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15 take note of any issues or changes which arose between sessions. Where prospective imagery
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17 had improved, this was discussed with the athlete, exploring the meaning of this and any
18
19 subsequent change in play. Likewise, variation or emergence of new imagery was explored
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21 alongside associated meaning, before processing using EMDR. To capture as many
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23 competitions as possible, rating scales were continued for competitions between and after
24
25 EMDR sessions, terminating approximately four weeks after the final intervention.
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32 Three of the four golfers (participants 2, 3, and 4) returned measures for the
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34 competition immediately prior to commencement of EMDR showing notably less negative
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36 imagery and lower anxiety. Related to the timescale for data collection, interventions
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38 occurred when clubs were hosting competitions marking the start of a National holiday. The
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40 three (adult) golfers reported that although competitive, these matches were associated with
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42 less stress, and greater enjoyment. This clearly impacted on the percentage of non-
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44 overlapping data (PND) analysis, a method which is vulnerable to the influence of outlying
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46 results and other external factors (Shadish & Rindskopf, 2007). In view of the significant
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48 effects these outlying results would have had on data analysis, a decision was made to
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50 continue data interpretation excluding the single result for each of the three golfers.
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1 Treatment of Data

2 Reflecting the divergent literature on the value of visual and statistical analysis in
3 single case research, a mixed-methods approach was taken, using statistical analysis to
4 complement visual inspection of the data. Typically, if both methods of analysis indicate that
5 a treatment effect has occurred, this enhances confidence in the validity of the intervention
6 (Barker et al., 2011). Ottenbacher (1986) proposed guidelines whereby single-cas data can
7 be analyzed using parametric tests, once certain assumptions are met. To illustrate, lag-1
8 autocorrelation tests were carried out on all data (baseline and intervention data were
9 combined due to numbers of data points available) using the A-B model tests. No significant
10 autocorrelation was identified for the data.

11 Following tests to confirm normality, baseline and intervention phase means, standard
12 deviation, and effect sizes for each phase change were calculated (Barker et al., 2011).
13 Independent samples t-tests were then used to examine differences in phase means for each
14 participant.

15 Results**16 Impact of Future Events**

17 Following EMDR, scores across baseline and follow-up phases (Figure 1), indicated
18 that all participants experienced a reduction in the impact of prospective imagery on the
19 IFES. PND was 100% for participants 1 and 4, 40% for participant 2, and 57.1% participant
20 3. Research indicates that a suggested that 70% PND indicated intervention effectiveness
21 (Scruggs & Mastropieri, 1998). All Participants showed a reduction in mean IFES scores
22 with effect sizes of 29.9 (large), 1.36, 1.36 and 2.24 (medium) respectively (see Table 1). All
23 four participants reported reductions in IFES scores, reaching statistical significance for
24 participant 1 (Mean Difference =14.95; $t_{(1,7)} = 4.35$; $p < .01$), and participant 4 (Mean
25 Difference =19.5; $t_{(1,7)} = 4.07$; $p < .01$).

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Cognitive Anxiety

A substantial reduction in cognitive anxiety (CA) was seen in participants 1 and 4, with PND of 100% for participant 1, and 83% in participant 4. With the most significant drop in IFES score and despite moving up to Interprovincial competition, golfer 1 reported a statistically significant improvement in CA (mean difference in phase CA scores = 6.25; ES = 4.23 large; $t_{(1,7)} = 5.12$; $p < .001$). Participant 4 also showed a statistically significant reduction in CA (Mean Difference = 6.0; ES = 3.6 large; $t_{(1,7)} = 3.00$; $p < .05$).

In contrast participants 2 and 3 showed no significant change in CA over the intervention period. Participant 2, with higher average baseline somatic and cognitive anxiety scores than other participants, reported significant personal difficulties and team conflicts during the research period. Negative imagery and anxiety related to golf performance increased intermittently during this phase and were processed in EMDR sessions with apparent benefit (indicated by reduced SUDs in session). During EMDR the golfer began to make connections between events effecting his personal life and golf performance, and to begin to build on positive past experience and his contribution as a team player.

Somatic Anxiety

A trend towards reduced SA was seen in participants 1 and 4 (PND 60% and 83% respectively), of moderate (ES = 1.41) and large (ES = 3.6) Effect Size. Reduction in mean difference in golfer 4 reached statistical significance ($t_{(1,7)} = 2.81$, $p < .05$). Although participants 2 and 3 showed no significant improvement in SA ratings, participant 3 reported an awareness of the increasing pressure as the season progressed, moving through qualification rounds. In keeping with past research, participant 3 found a level of physical arousal to be necessary for optimal performance, interpreting this as signifying his readiness to perform (Jones & Hardy, 1990). Processing negative imagery led this player to re-label

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1 emotions more positively, for example describing his arousal before a particular shot as being
2 ready for a challenge, rather than hampered by anxiety.

3 In sum, data indicated that following EMDR, all four golfers reported reduced impact
4 of prospective imagery, which was statistically significant for participants 1 and 4. Indeed,
5 the same golfers reported statistically significant reductions in cognitive anxiety. Somatic
6 anxiety demonstrated a reducing trend in participants 1 and 4, statistically significant for
7 participant 4.

8 **Social Validation**

9 All participants agreed or strongly agreed that addressing the effect of imagery on
10 their golf was important to managing anxiety and golf performance. Although one golfer
11 acknowledged having had concerns about EMDR prior to commencement of the study, none
12 felt that EMDR had caused any problems. All agreed or strongly agreed that EMDR had
13 helped them deal with imagery in their golf, and all reported that they would recommend
14 EMDR to golfers who had psychological difficulties with their game. Three of the four
15 confirmed that they still used EMDR techniques in their game (e.g., recalling positive
16 imagery), noting improvements in their mental game after EMDR. Two reported “some
17 improvement” in handicap, one a “definite improvement”. Commenting on why change in
18 performance might have occurred, one responded: “I used positive imagery and my control
19 place to help me when I felt pressure during competitive rounds”. Another replied: “Framing
20 the positive images to a safe place allows bad thoughts to leave”.

21 **Discussion**

22 We add to the extant EMDR in sport literature by examining the effects of EMDR on
23 negative prospective imagery in amateur golfers. To this end, this study is the first to explore
24 the application of EMDR on prospective imagery in a sport. Supporting the first of our
25 hypotheses, we found that following three EMDR sessions, all four golfers experienced

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1
2
3 1 reductions in the negative effects of prospective imagery, in keeping with previous clinical
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5 2 research (Romain, 2013). Importantly, during EMDR, the therapist asks the client to recall
6
7 3 the troubling image and identify negative emotions, sensations and beliefs. All four golfers
8
9 4 identified negative core beliefs including fears of failure and ridicule, which were processed
10
11 5 according to EMDR protocol, before further processing of negative imagery until resolved
12
13 6 (Shapiro, 2012). For example, one golfer reported prospective images of his shot going “out-
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15 7 of-bounds”, where the course narrowed. He was able to recall an image of this happening in
16
17 8 previous rounds, associated with frustration and embarrassment. During EMDR, the old
18
19 9 memory and associated negative beliefs were processed, before addressing prospective
20
21 10 imagery. The golfer reported that following processing, the image of the course changed until
22
23 11 he could see only the fairway beyond, not the obstacle itself. Anxiety related to the image
24
25 12 reduced significantly in session with reduction in IFES apparent for the duration of the follow
26
27 13 up. This example illustrates the importance of past experience and interpretation of events,
28
29 14 and may help explain varying responses to the intervention.
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34 15 Although three sessions of EMDR appeared to be effective in reducing the impact of
35
36 16 imagery, personal meaning and associations may require further processing. For example,
37
38 17 the use of EMDR in trauma has shown improvement in both cognitive and somatic symptoms
39
40 18 (Shapiro, 1989), however more sessions (>3) might be required for the effects to be
41
42 19 maintained. Following EMDR, trauma imagery and avoidance generally improve more than
43
44 20 anxiety and withdrawal, potentially related to re-traumatization (e.g., Blake, Abueg,
45
46 21 Woodward, & Keane, 1993). To illustrate, as the golfers continued to be exposed to their
47
48 22 own “traumas” this may have contributed to the apparently greater effects on cognitive over
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50 23 somatic anxiety, and underscores the importance of processing all emotional and cognitive
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52 24 associations wherever possible. These associations would be expected to shape the athlete’s
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54 25 appraisal of both anxiety/arousal and related imagery and should be amenable to specific
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1 processing using EMDR. It may also be that physiological symptoms (identified as anxiety)
2 remains conditioned by competition, even after the psychological aspects of the “trauma”
3 have been processed. These symptoms would be beneficial if labeled as facilitative as in elite
4 athletes (e.g., Jones & Hardy, 1990; Rees, Ingledeu, & Hardy, 2005). Perceived control as
5 part of the three dimensional model of anxiety has been shown to have significant effects on
6 sport performance (Cheng, Hardy, & Woodman, 2011), and therefore it may be that negative
7 future imagery impacts significantly upon athletes’ perceptions of control and coping.

8 In keeping with other single-case research (Barker et al., 2011), this work was subject
9 to certain limitations. Time limits on data collection (such as timetable for thesis completion,
10 athletes’ competition and availability schedules) meant that extraneous factors may have
11 exerted greater effect on phase data, which would have been minimized had baseline and
12 intervention/follow-up phases been further extended. In practice, greater flexibility in the
13 scheduling of EMDR, where more individual allowance for processing to occur may be
14 helpful in shaping further intervention and the responses to this. Furthermore, in this study,
15 we relied wholly on self-report measures with which to determine intervention efficacy and
16 effectiveness. Indeed, the use of objective measures such as golf scores or handicap change,
17 would have provided further contextual information along with exploration of the
18 performance benefits of EMDR in sport. Finally, we appraise that data have been collected
19 from amateur level golfers and therefore generalizing findings to professional golfers may be
20 problematic. To this end, we support recent calls in applied sport psychology to explore
21 research opportunities with elite and or professional athletes when possible (Barker,
22 Mellalieu, McCarthy, Jones, & Moran, 2013).

23 As EMDR should be seen as an integrative therapeutic technique rather than simply a
24 form of “desensitization” it should be stressed that the process belongs most effectively as
25 part of a holistic assessment and intervention program for the athlete. Although the four

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2
3 1 golfers in this research were each motivated to seek help, cautiously optimistic about the
4
5 2 procedure, and had been screened for previous mental health difficulties, it was noted that in
6
7 3 processing key target imagery, previous experience (small “t” trauma) invariably became
8
9 4 important, requiring that negative self-belief and associated affect had to be processed in
10
11 5 parallel. The potential for previously unresolved trauma to be uncovered remains, and must
12
13 6 be explained carefully to potential participants. EMDR training and accreditation requires
14
15 7 the practitioner to be a licensed Mental Health Practitioner, or senior student or Intern on an
16
17 8 approved mental health course (EMDR International Association; <http://www.emdria.org>).
18
19 9 The practice of EMDR in sport therefore remains the purview of those with clinical Mental
20
21 10 Health experience, and given the potential for previous trauma to re-emerge, informed
22
23 11 consent and safe de-escalation strategies remain essential to safe and effective EMDR
24
25 12 practice. The “therapeutic” potential however appears to be meaningful given the
26
27 13 experiences of the golfers in this study. To illustrate, once engaged in the process, the
28
29 14 participants enthusiastically provided often vivid examples of imagery and facilitative anxiety
30
31 15 with which to work, suggesting that EMDR could be a useful adjunct to many areas of
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33 16 performance enhancement. Indeed, Bennett and Maynard (2016) noted the value of EMDR,
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35 17 stressing the importance of a multi-disciplinary approach, involving athlete, clinician and
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37 18 coach/support team.

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43 19 This study is the first to explore the effects of EMDR on the deleterious effects of
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45 20 negative prospective imagery in sport, specifically here in golf, however future researchers
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47 21 might extend this work in other sport settings. As well as using EMDR to diminish the
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49 22 effects of flash-forwards imagery, the Performance Enhancement protocol (Foster & Lendl,
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51 23 1995) could be explored as a counterbalance to prospective negative imagery, assisting the
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53 24 athlete in developing or enhancing awareness of personal strengths or coping strategies as an
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55 25 aid to future performance. As confidence in individuals’ abilities to use imagery is linked to
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EMDR FOR PROSPECTIVE IMAGERY IN GOLF

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3 1 cognitive imagery effectiveness (Short, Tenute, & Feltz, 2005), it would be practically useful
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5 2 to determine the effects of EMDR in enhancing imagery skills. EMDR use in situ,
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7 3 particularly where exposure and environmental equivalence occur (Holmes & Collins, 2001),
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9 4 and where self-administered EMDR would be feasible (Artigas & Jarero, 2009), are areas
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11 5 worthy of further study.
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14 6 In this study we have highlighted how EMDR may reduce the deleterious effects of
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16 7 negative future oriented imagery in sport, demonstrating the potential for directly reduced
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18 8 perceived impact, as well as cognitive and somatic anxiety measures. The participants'
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20 9 reports of social validity and acceptability underscore the potential for this intervention to
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22 10 play a valuable role in addressing the performance limiting effects of "flash-forward"
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24 11 imagery.
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27 12 **Acknowledgements**

28
29 13 Thanks to Dr Matt Slater and Andrew Wood for comments on earlier drafts of this
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31 14 manuscript, and to Dr Deeprase and Dr Holmes for permission to use the Impact of Future
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33 15 Events Scale.
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1 Table 1. Phase Means, Standard Deviations and Effect Sizes (* = Medium ES; ** = Large
2 ES).

	Baseline Av	Baseline SD	Intervention Av	Intervention SD	Effect Size
Participant 1					
Somatic Anxiety	14.5	1.92	11.8	2.78	1.41*
Cognitive Anxiety	15.75	1.5	9.4	2.07	4.23**
Impact Future Events	44.75	0.5	29.8	6.76	29.9**
Participant 2					
Somatic Anxiety	20.6	2.07	21.8	3.03	-0.58
Cognitive Anxiety	19	1.1	18	1.23	0.91*
Impact Future Events	56.5	2.43	53.2	4.6	1.36*
Participant 3					
Somatic Anxiety	13.75	3.4	15	3.56	-0.07
Cognitive Anxiety	11.4	1.89	11.71	2.69	1.08*
Impact Future Events	34.5	8.39	25.86	7.1	1.03*
Participant 4					
Somatic Anxiety	14.67	1.53	9.17	3.13	3.6**
Cognitive Anxiety	14	1.73	8	3.16	3.46**
Impact Future Events	54	8.72	34.5	5.82	2.24**

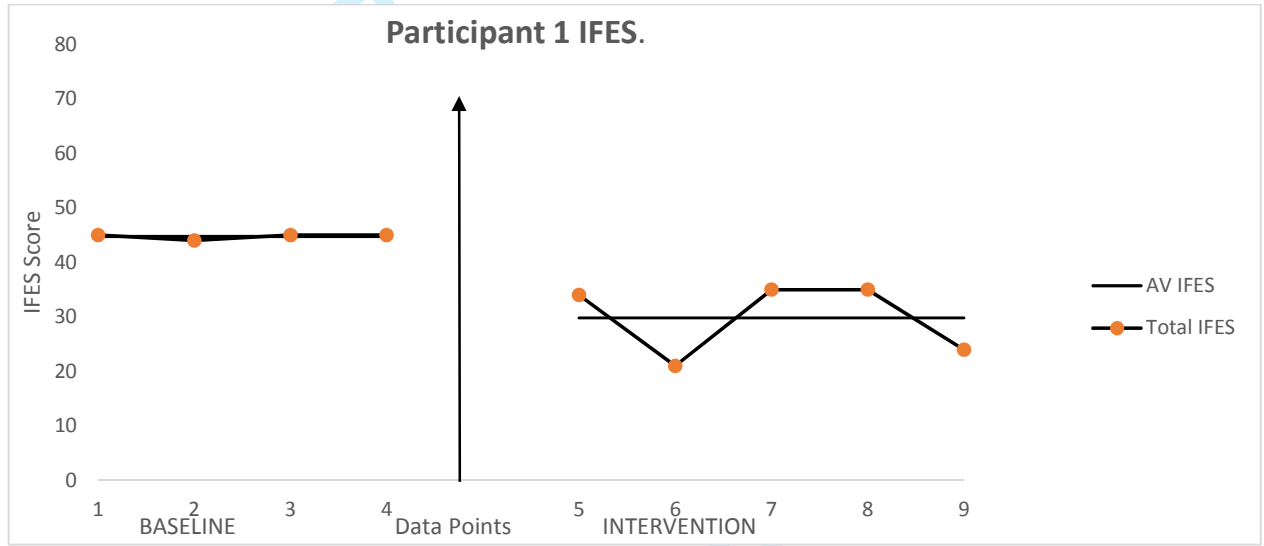
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- 3 **Figure Captions.**
- 4
- 5 1 Figure 1. Impact Future Events Scores across Baseline and Intervention/Follow-up Phases
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- 9 4 Figure 2. Cognitive Anxiety Scores across Baseline and Intervention/Follow-up phases.
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- 11 5
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- 13 6 Figure 3: Somatic Anxiety scores across Baseline and Intervention/Follow-up phases
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EMDR FOR PROSPECTIVE IMAGERY IN GOLF

1 Figure. 1.

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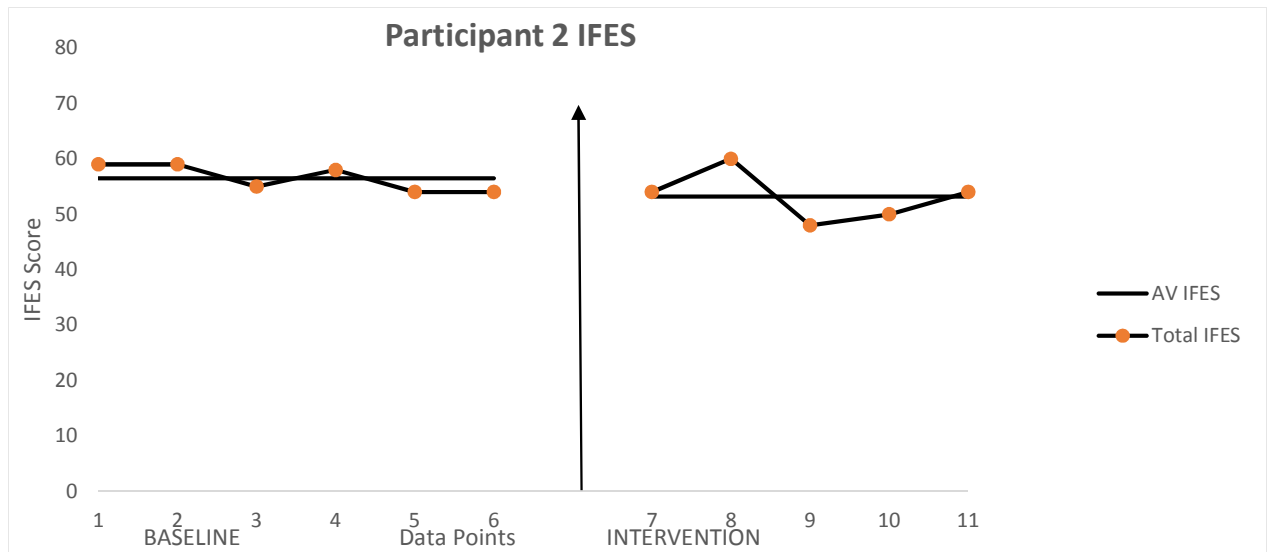


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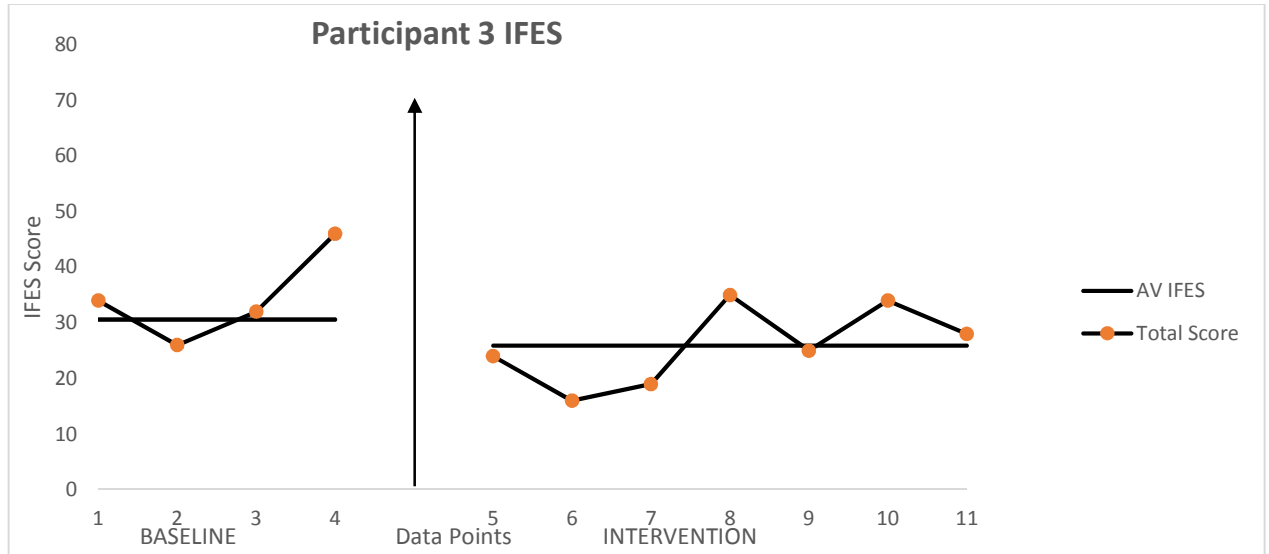
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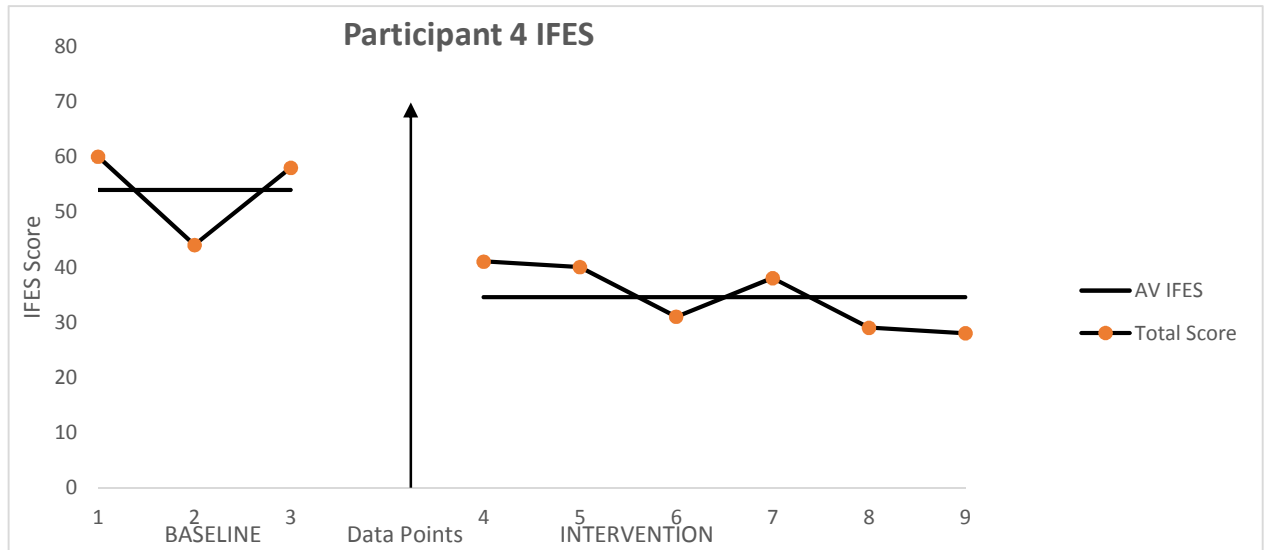
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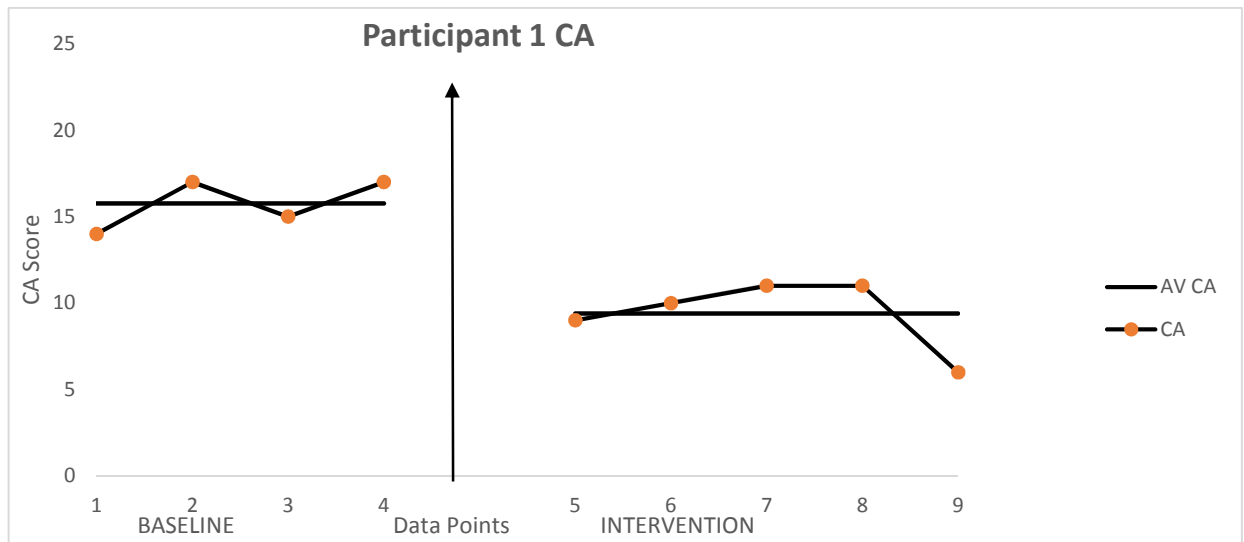
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1 Figure 2.

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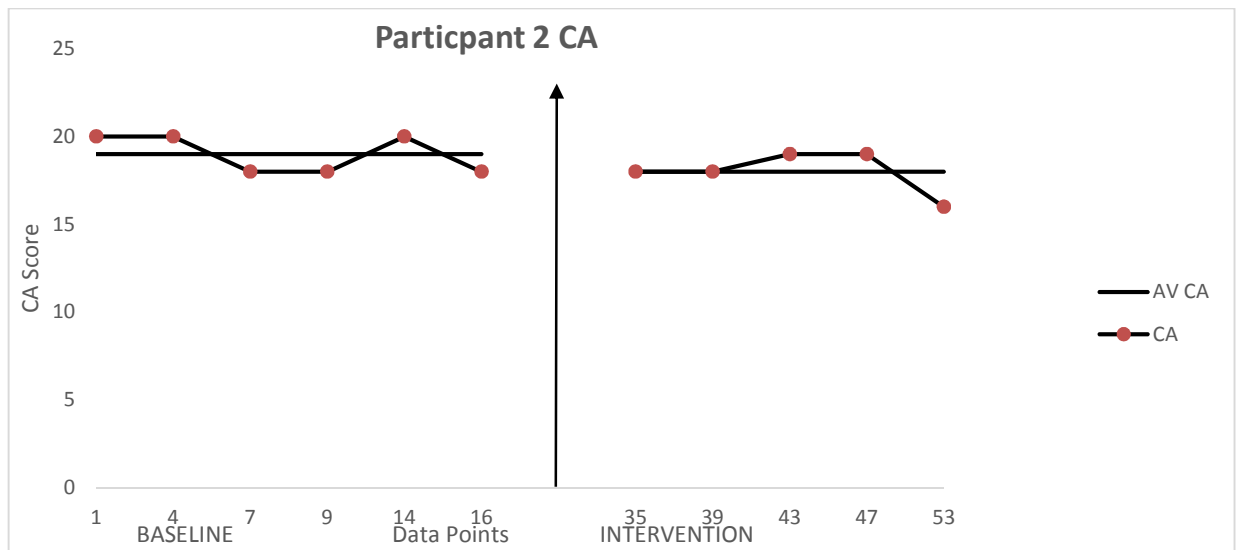


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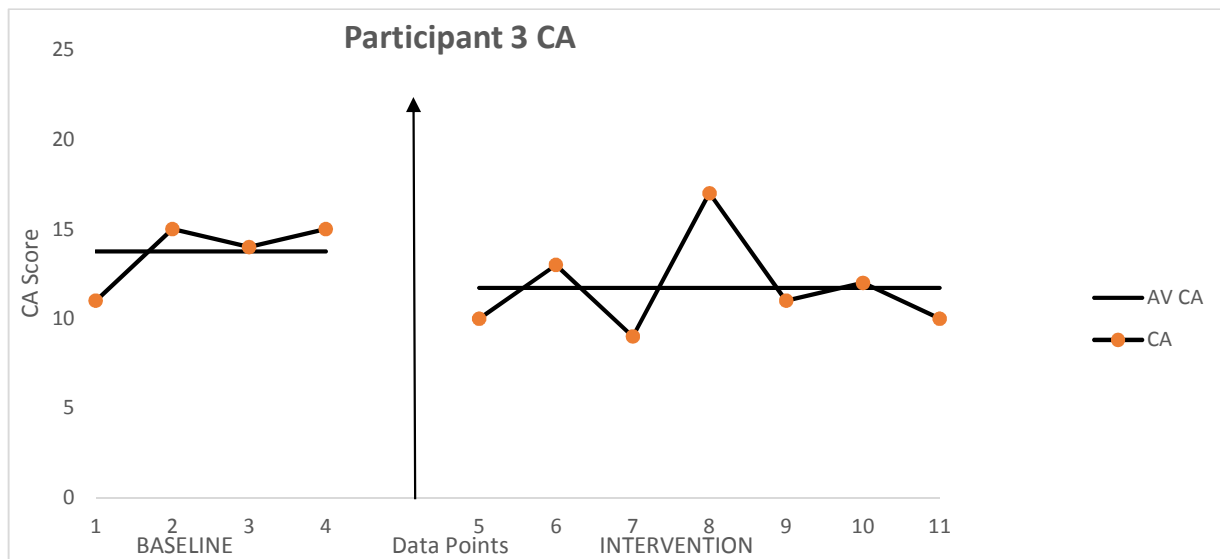
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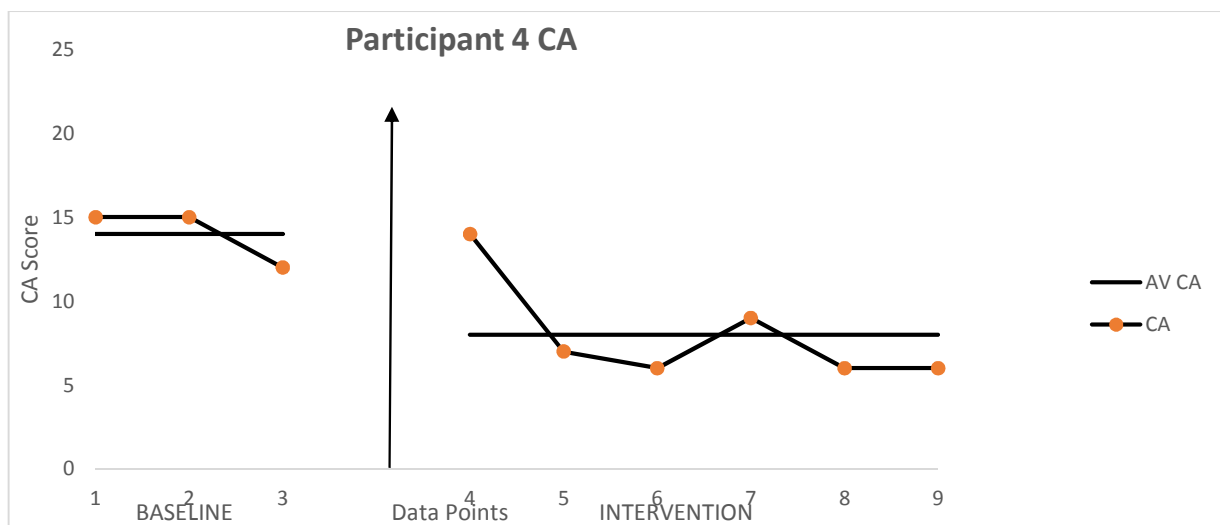
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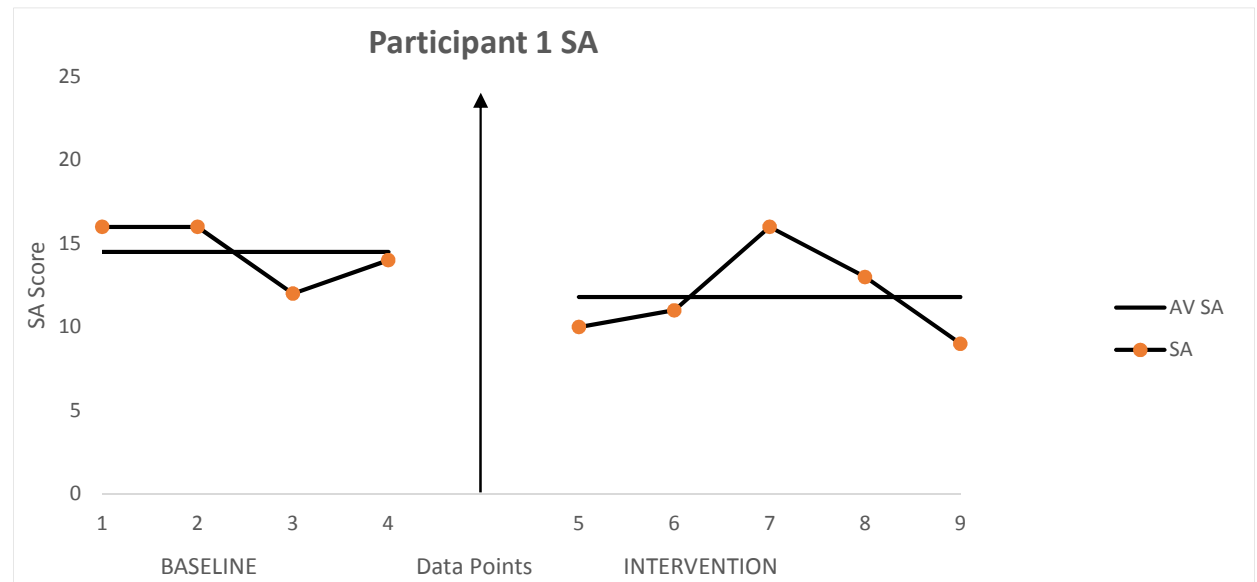
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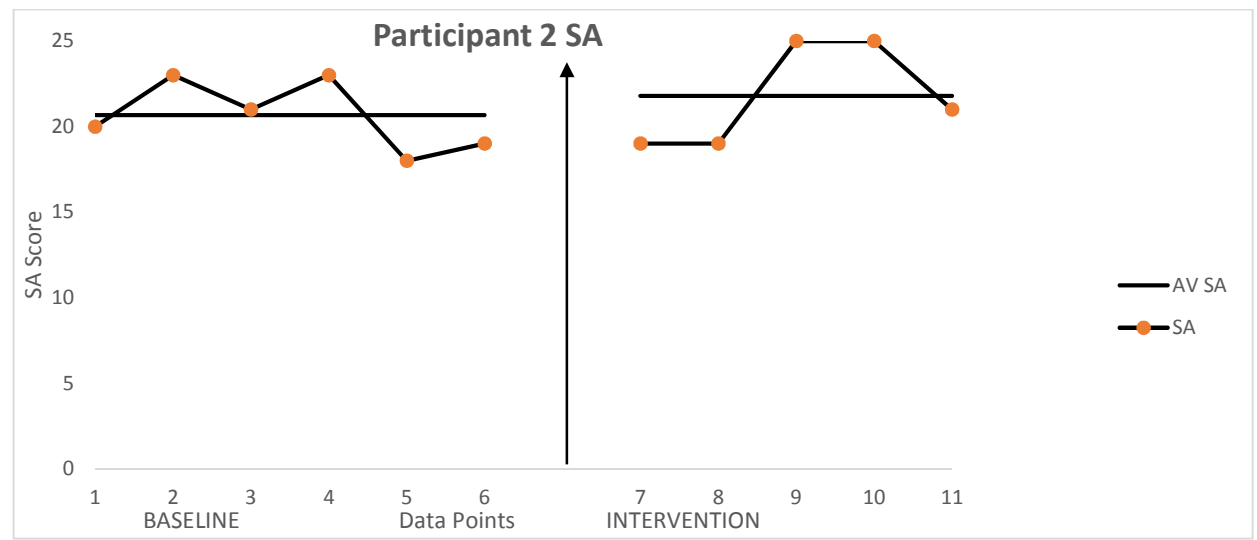
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1 Figure. 3.
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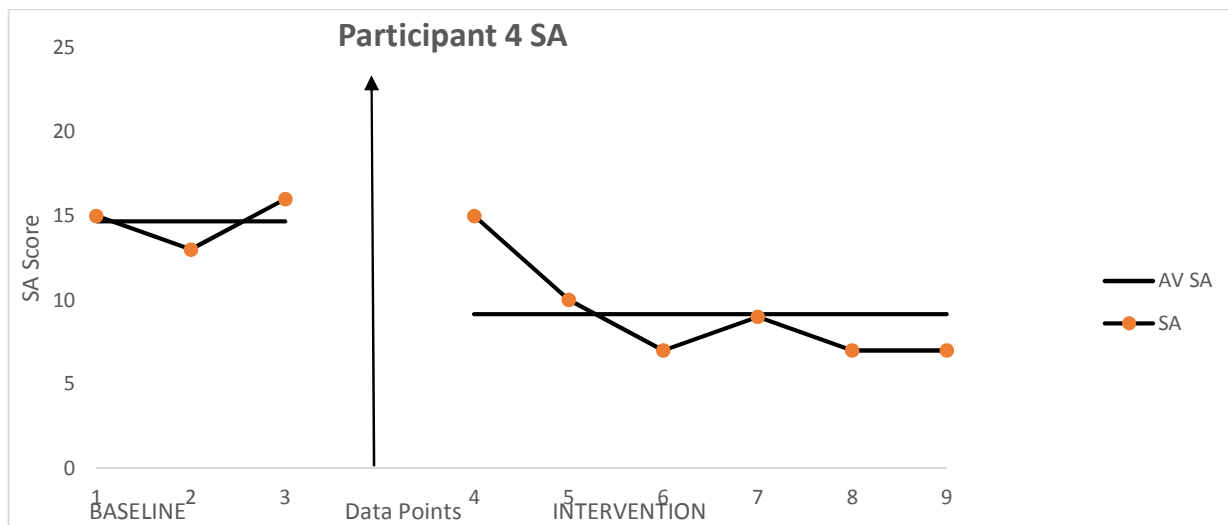
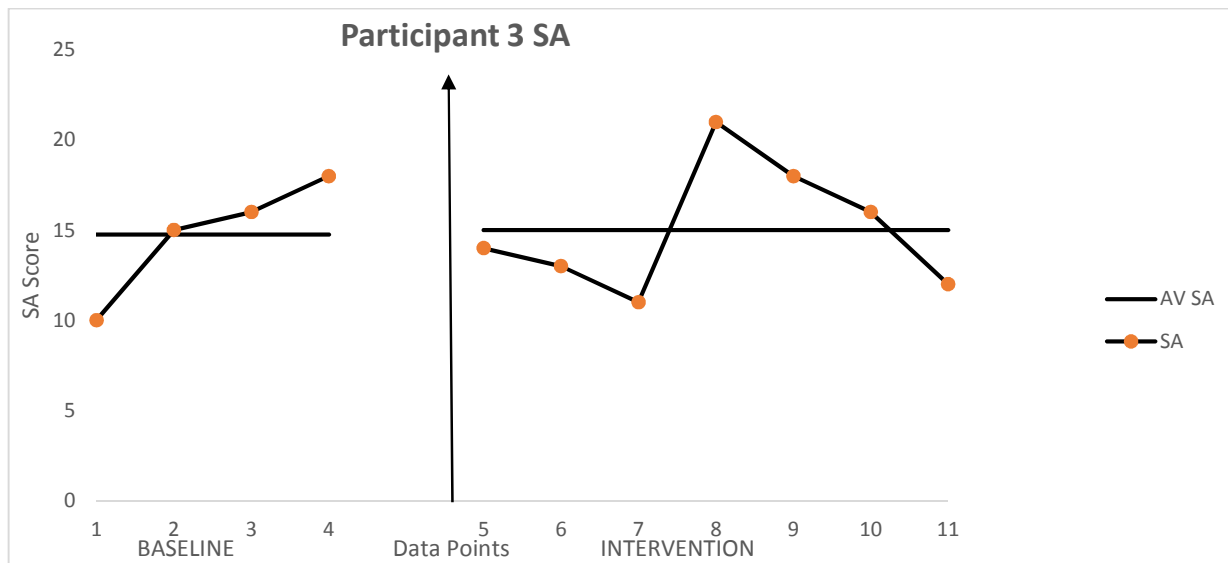


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