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3   Coach-athlete perceived congruence between actual and desired emotions in karate

4   competition and training

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13   **Abstract**

14   Coaches can help athletes regulate emotions but would benefit from tools that help them

15   accurately perceive athletes' emotions. In the present study, we investigated the use of video

16   recorded performances to compare three martial artists' ratings of desired and actual

17   emotions with their coach's ratings. Results show how desired emotions progressively

18   fluctuated throughout competition. Furthermore, desired and actual emotions differed

19   between training and performance contexts. Finally, we report correlations between

20   performance and perceived congruence in desired and actual emotions. Cumulatively, results

21   offer support for the video-assisted recall of emotions as an intervention tool in developing

22   emotion regulation abilities.

23   Keywords: emotion, performance, affect, psychological skills, mood

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27   Research indicates that martial artists experience a wide range of emotions before and

28   during competition (Cerin & Barnett, 2011; Robazza, Bortoli, & Hanin, 2004; Ruiz & Hanin,

29   2004, 2011; Terry & Slade, 1995) and that these emotions can strongly influence

30   performance (e.g., Chapman, Lane, Brierley, & Terry, 1997; Devonport, Lane, & Hanin,

31   2005). Therefore, the ability to regulate emotions becomes an important mental skill for

32   martial artists to learn, develop and master. Emotion regulation refers to efforts to change

33   one's feelings in the pursuit of hedonic and instrumental goals (Tamir, Mitchell, & Gross,

34   2008). Emotion-performance relationships tend to be very individual (Hanin, 2010) and so

35   there is not a common emotional profile that could be used as a standard for emotion

36   regulation. Effective emotion regulation, however, involves the deliberate attainment of a

37   desired emotional state (Gross, 2015), thus, it is crucial to identify the discrepancies between

38   the emotions that athletes actually experience, and those that they would desire to experience.

39   Athletes, and martial artists in particular, use a variety of strategies to regulate their emotions

40   including listening to music, self-talk, talking to others, and imagery (Lane, Beedie, Jones,

41   Uphill, & Devonport, 2012; Massey, Meyer, & Naylor, 2015). However, not all emotion

42   regulation is self-driven or initiated by the athlete. Athletes' emotions can be regulated by

43   others (e.g., teammates, coaches, referees), a process labelled interpersonal emotion

44   regulation (e.g., Friesen et al., 2013; Friesen, Devonport, & Lane, 2016; Niven, Totterdell, &

45   Holman, 2009). Particularly, coaches can influence athletes' emotions either directly via

46   persuasive techniques that aim to change the athlete's appraisals or indirectly through self-

47   management and emotion contagion (Friesen et al., 2013). The aim of the present study is to

48   investigate differences between desired emotions and actual emotions (i.e., emotions actually

49   experienced) by martial artists, examining the perspectives of the coach and the athlete.

50   Athletes typically regulate their emotions to achieve certain goals (Lane, Beedie,

51   Devonport, & Stanley, 2011). This type of instrumental emotion regulation is therefore

52   dependent on the setting that the athlete is exposed to (Campo, et al., 2016; Tamir, 2011).

53   Typically, the goal in competition is to defeat your opponent or achieve personal best

54   performances where the perceived or actual consequences of failure are usually high.

55   Conversely, within a training setting, goals are more learning-focused, intended to practice

56   skills and learn new techniques, and failure is seen as a normal part of learning. Not

57   surprisingly, research indicates differences in emotional experiences between training and

58   competition (Nicholls, Levy, Grice, & Polman, 2009; Terry & Lane, 2000).

59   Whether a coach should attempt to regulate an athlete's emotion is guided by

60   empathic discrepancies between desired emotions (i.e., what they want their athlete to feel)

61   and actual emotions (i.e., what they perceive their athlete to feel) (cf. Zaki & Williams,

62   2013). For example, if a coach perceives her athlete to be feeling anxious and believes that

63   this feeling is detrimental to performance, the coach will likely attempt to help the athlete

64   reduce the anxiety. In this case, the perception of emotions and awareness or knowledge

65   about their functional impact on performance is crucial. However, the coach does not have

66   access to the athlete's inner feelings and therefore can only infer their athletes' feelings from

67   observing expressions and using empathy (Petrides, Furnham, & Mavroveli, 2007).

68   Following temporal models of emotion regulation (e.g., Gross, 2015), emotion perception

69   represents the starting point for consequential regulation, with inaccurate perceptions leading

70   to emotion regulation failure. Likewise, the ability to perceive another person's emotional

71   states represents an important part in the interpersonal emotion regulation process (Dixon-

72   Gordon, Bernecker, & Christensen, 2015; Losoya & Eisenberg, 2001). That is, before

73   emotion regulation strategies can be deployed, the coach needs to accurately perceive how his

74   or her athlete is feeling, and importantly, wants to feel. Regarding this process, the individual

75   relationships between emotion and performance presents a challenge for a coach. Consider an

76   example of two athletes feeling energetic before a contest. One athlete might want to feel

77   even more energetic, whereas the other athlete might wish to feel calmer. In such instances,

78   the coach would need to be able to perceive a discrepancy between how each athlete is

79   currently feeling and how the athlete wants to feel, to help determine appropriate emotion

80   regulation strategies for each athlete.

81   Assessing emotions in sport performances has some limitations based on the nature of

82   emotion and the confines of research. While a complete discussion of these limitations is

83   beyond the remit of the current study (see Lane & Terry, 2016), there is a need for new

84   methods to be developed based on the following emotion-performance characteristics. The

85   first is that emotions are transitory in nature (Cerin, Szabo, Hunt, & Williams, 2000; Hanin,

86   2010). What and how intensively an athlete feels can vary throughout a performance

87   depending on the athlete's appraisal of the interaction with the environment (Lazarus, 2000).

88   As matches progress and results unfold, the emotions athletes might desire to feel will change

89   to coincide with new emergent performance goals. For example, an athlete might desire to

90   feel very aggressive at the start of a match, but if the athlete becomes injured part-way

91   through, the athlete might desire to not feel so aggressive in order to keep from exacerbating

92   the injury. Methods that capture this dynamic nature can be preferable to assessing emotions

93   only prior to competition (e.g., Cerin & Barrett, 2011; Jones, Lane, Bray, Uphill, & Catlin,

94   2005; Lane et al., 2010).

95   Secondly, not only are the type and the intensity of emotions important to assess, but

96   Thomas, Picknell, and Hanton (2011) has also demonstrated that measuring the frequency of

97   emotional changes throughout a performance can provide a more accurate description of an

98   athlete's experiences. Therefore, a method that can record both intensity and frequency is

99   warranted (Martinent, Campo, & Ferrand, 2012). Thirdly, Terry (1995) argued that while the

100   pre-competition phase represents a practical opportunity for a sport psychologist to intervene

101   or consult with athletes, coaches are in the unique position where they have multiple

102   opportunities to regulate athletes' emotions throughout competition (Martinent, Ledos,

103   Ferrand, Campo, & Nicolas, 2015). Therefore, assessing methods that utilize this advantage

104   is important for sports psychology research.

105   Many researchers have argued that video recording is an effective practical tool for

106   assessing emotional states experienced during competition (Bertram, Marteniuk, &

107   Guadagnoli, 2007; Ives, Straub, & Shelley, 2002; Martinent et al., 2015). Previous research

108   examining optimal emotional states for performance has tended to rely on past recollections

109   of emotional events whereby athletes identify their feelings at a specific point in time (e.g.,

110   Dewar & Kavussanu, 2011; Nicholls, Polman, & Levy, 2011). With the aid of video replay,

111   participants view performance footage and describe or rate emotions experienced in real-time

112   (cf. Campo et al., 2016; Martinent et al., 2015). This type of method to study interpersonal

113   emotion regulation has been used in other areas of psychology to good effect (e.g., Butler,

114   Hollenstein, Shoham, & Rohrbaugh, 2012; Parkinson & Simons, 2012).

115   In sum, previous research examining emotion regulation has taken an athletes'

116   perspective mainly focusing on the specific strategies used by them in order to successfully

117   pursue instrumental goals. The role of others, and that of the coach in particular, has typically

118   not been considered in emotion regulation. The perception of emotions and knowledge about

119   the functional impact on performance is crucial for effective emotion regulation. Exploring

120   the discrepancies between athletes' actual emotions and desired (optimal) emotions both from

121   an athlete's and a coach's perspective would have important implications for emotion

122   regulation. The aim of the present study was to investigate differences between desired

123   emotions and actual emotions of martial artists, examining the perspectives of the coach and

124   the athlete. We hypothesised that there will be differences in desired emotions between

125   training and competition settings (hypothesis 1); there will be fluctuations in desired

126   emotions throughout competition (hypothesis 2); and there will be significant correlations

127   between perceived performance and the extent to which desired and actual emotions were

128   congruent (hypothesis 3).

129   **Method**

130   **Participants**

131   The coach was a 40 year old male with 24 years of experience coaching national and

132   international level athletes in karate. Three of his athletes participated in this case study and

133   their descriptive profiles are presented in Table 1.

134   <Insert Table 1 here>

135   **Measures**

136   **Emotions**. We developed an instrument comprised of two questions asking, "Rate

137   how you wanted to feel at the start of the fight (or training session)" and, "Rate how you were

138   actually feeling at that time." Each question included nine items representing nine distinct

139   emotions (i.e., "happy," "angry," "calm," "downhearted," "energetic," "still," "sluggish,"

140   "enthusiastic," "anxious"). These emotions represent the four quadrants of Russell's (1980)

141   circumplex model of emotions that distinguishes emotions along a valence continuum and an

142   arousal continuum. Each item was rated on a 7-point Likert scale ranging from 1 (*not at all*)

143   to 7 (*extremely*). After answering these two questions, participants were given the following

144   instructions: "Now start watching the video and every time any emotion changed during the

145   session, pause the video, enter the time from the clip in the time column and rate all of your

146   emotions, and your performance at that point in the session." Space was provided on the

147   instrument for the participants to respond and rate each of the nine emotions for every time

148   they paused the video.

149   **Performance**. At each moment when participants reported their emotions, they also

150   reported an overall performance score based on their subjective perceptions (Terry, 1995).

151   This was rated on a 7-point Likert scale ranging from 1 (poor performance) to 7 (extremely

152   good performance).

153   **Procedure**

154   Following institutional ethical approval of the study, the coach and three of his

155   athletes from a martial arts club were approached to participate in the study. The

156   observational nature and procedures of the study were explained to the participants and

157   written consent to participate was obtained. Participants then provided demographic

158   information.

159   The coach was tasked with choosing and filming one practice session and one

160   competitive tournament match for each athlete. Each training session video lasted 90 minutes

161   with one hour being supervised by the coach. The footage that was analysed for training

162   included technical, tactical and sparring aspects. Competition videos varied in length in

163   accordance with the length of the matches. For Athlete 1, the competition consisted of four

164   fights, each a maximum duration of 3 minutes. He won all four fights, with the fourth being

165   an event final. For Athlete 2, the tournament video consisted of three fights, each a maximum

166   duration of 3 minutes, with her winning all three. For Athlete 3, the tournament video was of

167   two fights. He was eliminated from the contest after losing the second fight.

168   Within a week of the sessions being recorded, participants met individually with a

169   member of the research team to watch the videos. Athlete participants used the instrument to

170   report the emotions they had: (a) desired to feel, and (b) actually felt, in the hour before their

171   training session and competitive match. The athlete participants then watched their respective

172   videos. When watching the videos, any time the athlete remembered experiencing a specific

173   change in emotions, the athlete paused the video. Consistent with the approach used by

174   Martinent et al. (2012) for assessing emotions during performance, the researcher noted the

175   time at which the athlete paused the video, and recorded the athlete's rating of desired and

176   actual emotions experienced as well as performance using the instrument.

177   A similar procedure was then undertaken with the coach. The coach and researcher

178   watched the same videos and the researcher paused the videos at every time point the athlete

179   had paused the video. The coach then reported what he perceived the athlete's desired and

180   actual emotions were at that time using the instrument. The coach also provided subjective

181   ratings of performance at each pause.

182   **Data analysis**

183   To answer our research questions, we first examined whether athletes and coach

184   desired for the athlete to experience different emotions between training and competition

185   contexts. We used a repeated measures MANOVA to examine potential differences for the

186   athletes collectively as well as for the coach in the two conditions (i.e., training and

187   competition). For our second question, we separated desired emotion scores by the fight

188   round they were recorded in order to see whether desired emotions fluctuated throughout the

189   course of competition. We examined progressive changes using a repeated measures

190   MANOVA. Finally, we analysed whether congruence between desired emotions and those

191   that were actually experienced predicted ratings of performance. We subtracted scores for

192   desired emotions from scores from actual emotions creating a new variable (labelled

193   "emotion congruence"). We then correlated emotion congruence with perceived subjective

194   performance scores. We did this for each of the nine emotions for both the athletes and the

195   coach using Pearson correlations.

196   **Results**

197   In total, 90 time-point recordings ($N = 56$ competition; $N = 34$ training) were collected

198   and analysed (see Table 2).

199   <Insert Table 2 here>

200   We analysed whether the desired emotions differed across training and competition

201   contexts (hypothesis 1). The interaction between athletes' collective emotion intensities

202   indicated significant differences between these two contexts. (Wilks Lambda = 0.654;

203   $F[8,81] = 5.353$, p < .01, see Figure 1). There were higher intensity discrepancies for anger

204   and enthusiasm, with athletes reporting higher intensities scores for competition. Conversely,

205   athletes reported a desire to feel lower intensities for downheartedness and sluggishness in

206   competition. Responses from the coach also indicated a significant difference between

207   desired emotions across training and competition contexts (Wilks Lambda = 0.033; $F[8,80] =$

208   288.5, p < .01, see Figure 2). There were higher discrepancies for anxiety and calmness, with

209   higher intensity scores desired for competition. And, similarly to the athletes, the coach

210   reported lower desired intensities for downheartedness and sluggishness in competition.

211   <Insert Figure 1 here>

212   <Insert Figure 2 here>

213   We also sought to determine whether athletes' desired emotions fluctuate throughout

214   the course of competition (hypothesis 2). Using rounds as time comparables, a repeated

215   measures multivariate test revealed significant differences throughout the course of

216   competition for all the athletes (Wilks Lambda = 0.424; $F [24, 122.4] = 1.75$, p < .05). See

217   Figure 3.

218   <Insert Figure 3 here>

219   We analysed the extent to which discrepancies between athletes' actual and desired

220   emotions correlated with perceived performance (hypothesis 3). Pearson correlations between

221   emotion congruence and performance were significant for all emotions. Similarly, we

222   analysed the extent to which discrepancies between the coach's perceived actual and desired

223   athlete emotions correlated with his perceived performance. Pearson correlations between

224   emotion congruence and performance were significant for all emotions, indicating that

225   greater congruency between the desired and actual emotion was positively correlated with

226   better perceived performance (see Table 3).

227   <Insert Table 3 here>

228   **Discussion**

229   The aim of the present study was to investigate differences between desired emotions

230   and actual emotions experienced by martial artists. We documented the differences in desired

231   and actual emotions across contexts (i.e., training vs. competition). We further found the

232   emotions athletes desired to feel both as reported by themselves and the coach fluctuated

233   throughout the course of competition. Finally, we found that there were significant

234   correlations between desired and actual emotion congruence and perceived performance for

235   most of the emotions. That is, higher congruence between what the athletes felt and what they

236   wanted to feel was associated with higher ratings of performance.

237   Results indicated that the athletes in this study desired to feel different emotions at

238   specific points in time in competition. Specifically, there was a progressive increase in high

239   energy feelings (i.e., anger, energetic, and anxiety) as the athletes progressed through their

240   competitive rounds. This is consistent with past research that suggests that optimal karate

241   performance can be achieved or maintained with high levels of unpleasant emotions (cf: Ruiz

242   & Hanin, 2004; 2011). The progressive increase in energizing emotions could be a tactical

243   strategy. Similar to training contexts, early rounds in competition might be devoted to

244   achieving information-gathering goals (i.e., opponents "feeling" each other out) to learn

245   about the other's fight style or tactics. As competition progresses, the goals can shift from

246   being primarily focused on information-gathering to including action-implementation. This

247   would then be reflected in the athlete's desired emotional state whereby the athlete would

248   desire energizing emotions to help facilitate quick and powerful movements (Perkins,

249   Wilson, & Kerr, 2001; Tod, Iredale, & Gill, 2003). An important implication for coaches and

250   athletes then would be to prepare emotion regulation strategies that can be effectively

251   employed during competition with minimal effort.

252   The athletes in this study presented significantly different desired emotion profiles

253   between training and competition contexts. This finding supports past research that has

254   highlighted these discrepancies (cf. Nicholls et al., 2009; Terry & Lane, 2000). Whilst sports

255   psychology practitioners often encourage athletes and coaches to practice in training the

256   psychological skills that they intend to employ in competition, our results highlight that the

257   training context itself represents a performance setting with its own particular goals.

258   Unsurprisingly, both athletes and coach wanted reported desired intensities for

259   downheartedness and sluggishness to be nearly zero. This is to be expected as both emotions

260   are associated with physical exhaustion which would not be perceived as instrumental to

261   martial arts (Robazza et al., 2004). The athletes reported the desire to feel higher levels of

262   anger, whereas the coach desired higher levels of anxiety in competition. Both of these

263   emotions have been reported as potentially useful for performance effects in martial arts

264   (Ruiz & Hanin, 2004, 2011). Research on psychological skills usage indicates that athletes

265   are more prone to use psychological skills in competition rather than practice settings (Lane,

266   Harwood, Terry, & Karageorghis, 2003; Thomas, Murphy, & Hardy, 1999). Our results

267   suggest that sports psychology practitioners work with coaches and athletes to develop

268   effective psychological skills that might aid in achieving training session goals.

269   Findings from the current study also suggest that perceived performance is related to

270   whether or not athletes are feeling how they desire to feel in competition. That is, participants

271   believed that they were performing particularly well when there was minimal discrepancy

272   between desired emotions and those that were actually experienced. The extent to which

273   athletes feel how they desire to feel in competition can be indicative of their attempts to

274   regulate emotions (Gross, 2015; Lane et al., 2012; Tamir, et al., 2008). That is, if an athlete is

275   feeling how they desire to feel, they can be considered as successful in regulating their

276   emotions. Conversely, if there is a large discrepancy between desired emotions and actual

277   emotions, this would suggest a failure to regulate emotions. The results from our study

278   suggest that athletes will typically be pleased with their performance when they are also

279   successful at regulating their emotions.

280   Another applied recommendation from the present study is that video recording offers

281   a practical way of accessing emotional states experienced during competition and training (cf:

282   Bertram et al., 2007; Ives et al. 2002; Martinent et al., 2015). Previous research to identify

283   optimal emotional states for performance has tended to rely on past recollections of

284   emotional events whereby athletes identify their feelings at a specific point in time (e.g.,

285   Robazza et al., 2004), including their best or worst performances (Hanin, 2010) without the

286   use of visual prompts. We suggest that recording an athlete's performance is not only

287   relatively straightforward with modern technology, but also offers a useful approach to help

288   identify differences between coach and athlete perceptions of performance or situations

289   experienced. Raising self-awareness should act as a trigger to initiate self-regulatory

290   processes to reduce discrepancies between current and optimal emotional states (Carver,

291   2004). Video recording also allows coaches to collect data on their athletes in genuine

292   performance settings. Research contrasting accuracy of interpersonal perceptions of emotions

293   has often relied on data collection from laboratories where the emotions that participants

294   experience do not necessarily resemble those experienced in natural settings (Gross, 2010).

295   Video recordings circumvent this limitations aiding to its potential as a practical training tool.

296   The current study has a number of limitations. The first limitation is a very small

297   sample size. The study, however, contrasted athletes' actual and desired emotions both from

298   an athletes and coaches perspective in a total of 90 time-point recordings which allowed for a

299   sound analysis of such discrepancies. The authors were interested in developing a strategy to

300   help athletes and coaches monitor emotion perceptions (both intra- and interpersonal) which

301   represents the precursor to emotion regulation (Lane et al., 2012). Secondly, with the addition

302   of measures of objective performance, there might have been the opportunity to extend the

303   implications of the study pertaining to emotion-performance relationships. Future research

304   should address these limitations and examine whether the effects remain comparable. With

305   video-assisted recall becoming a useful tool in emotion regulation research, it would be

306   prudent for future research to include these procedures in experiments that test the efficacy

307   and effectiveness of emotion regulation strategies. Given that many sports already include

308   videos as part of their technical and tactical debriefs, there is opportunity for psychological

309   and emotion regulation skills to be included within such debriefs with minimal additional

310   effort.

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