

Arousal and Motivation after Conceding Costly Penalties in British Professional Rugby

Jonathan MELVILLE * and Guido GEISLER *

Abstract

This descriptive research used a reversal theory framework to address how conceding costly penalties can affect motivation and arousal levels in British professional rugby. Six rugby union players completed the State of Mind Indicator for Athletes (SOMIFA) on two occasions. The first occasion served to determine their optimal in-event motivational states and three dimensions of arousal. On the second occasion, the players watched video footage of themselves conceding a costly penalty in a previous game; they then completed the SOMIFA to recall their feelings immediately after the penalty on the same motivation and arousal measures. The results indicate that conceding a costly penalty can alter arousal from optimal levels and induce psychological reversals in somatic motivational states. Penalties are also likely to change the salience of players' dominant motivational states. The findings are considered in the context of reversal theory, and practical interventions are suggested that may help players maintain optimal motivation and arousal levels after conceding penalties during games.

Key words: arousal, motivation, penalties, reversal theory, rugby union

Staying mentally on task following a costly error or penalty is vital in team sports. At elite levels in particular, outcome often hinges on small “game-changing” moments, and if errors or infractions negatively affect players' motivation or push arousal outside an optimal range, teams face a greater risk of conceding points and potentially losing games. In rugby union, for instance, players who commit penalties inside their own half increase the likelihood that the opposition will attempt to kick for three points, kick for touch, or take a scrum from where the infraction was committed, with the aim of scoring a try. It is therefore critical that players learn to mentally set aside infringements immediately after they happen so as to prevent causing their teams any further disadvantages or setbacks.

Conceding penalties in professional rugby union can generally be attributed to three types of errors, or *failures*—failing to execute a skill effectively, failing to stick to the team's game plan, or failing to abide by the rules of the game. Research has shown that sports success and failure can have a direct effect on athletes' affective states, with unsuccessful performance often leading to negatively toned emotions in various competitive con-

texts^{4,24,26}, including rugby²²). In turn, those emotions can be detrimental to subsequent arousal, motivation, and performance^{6,7}), and at such times, players need access to effective psychological techniques which can facilitate a swift return to optimal performance states.

Reversal theory^{1,2}) offers a structural-phenomenological approach that addresses the interactions between human arousal, emotions, and motivation. Within the reversal theory framework, a person's subjective experience of any given event is influenced by certain contingencies and patterns, and this individual interpretation means that a performer's emotions and cognitions can be manipulated in order to achieve an ideal performance mindset. Thus, reversal theory's scope extends beyond other models that focus purely on anxiety and/or situational states of emotion, such as Martens, Vealey, and Burton's²⁵) multidimensional theory of anxiety. It also offers a more organic view than achievement goal orientation⁸) or other more traditional theories of motivation. Instead, reversal theory considers human behaviour to be inherently inconsistent and capable of undergoing radical changes during relatively short periods of time¹⁸). The theory contends that personality, arousal, and motivation arise

* Institute for Sport, Physical Education, and Health Sciences, University of Edinburgh

through quick and frequent “reversals” between four paired and opposite sets of *metamotivational states*^{1,16)}. This means that an individual can engage in the same behaviour at different times in different metamotivational states, resulting in disparate experiences. Similarly, two individuals can engage in the same behaviour but be in different states, resulting in different and even opposite experiences¹⁸⁾. Psychological reversals exist in order to maximize hedonic tone (pleasant affect), and by determining which shifts are likely to occur in certain situations, it is possible for performers to plan personalized psychological techniques that can be implemented in those situations. In recent work²¹⁾, the prefix has been dropped from the word “metamotivational” such that the different orientations can also be referred to more simply as “motivational states.”

Reversal Theory and Motivational States

Apter¹⁾ and Kerr¹⁶⁾ note that reversal theory’s four paired states are described as telic-paratelic (or serious-playful), conformist-negativistic (or conformist-rebellious), mastery-sympathy, and autic-alloic (or self-other oriented). Performers are able to reverse between the two states in each pairing but cannot span both at the same time. The telic-paratelic and conformist-negativistic pairs comprise the *somatic* states and are concerned with how people experience their own bodily arousal. The mastery-sympathy and autic-alloic pairs are termed the *transactional* states and relate to performers’ interactions with other people. None of the orientations are seen as traits or enduring dispositions. However, people in perfor-

mance situations typically have a preferred or dominant state which allows them to function at an ideal or peak level, and this is referred to as metamotivational state dominance¹⁹⁾. Competitive athletes tend to be dominant in the telic (serious, goal-oriented) or paratelic (playful, oriented toward the here-and-now) states. Table 1 highlights the key characteristics of each motivational state.

People experience reversals between the paired sets of states due to any one of three processes—contingency, frustration, or satiation¹⁹⁾. Contingency refers to environmental changes around the performer that can alter the circumstances of a game or competition (e.g., a poor call by an official). Frustration generally occurs when a performer is unable to achieve success in his or her current state, and although it may be contained initially, a reversal is likely to occur if the athlete’s frustration persists. Satiation is usually experienced by performers if they have been in the same motivational state for an extended period of time. Reversals are thought to be involuntary; that is, athletes cannot simply decide to initiate a reversal between states. However, the extant literature^{17,19)} suggests that at times, performers may be able to encourage reversals to preferred motivational states through the use of personalized psychological techniques (to be discussed in subsequent paragraphs).

It must also be noted that at any given time, the relative importance of each motivational state will vary for different performers, with some states being more salient than others¹⁹⁾. Much like the case with reversals between states, certain situations may cause the relative salience of certain states to change, leading the performer to be

Table 1. Characteristics of the Four Pairs of Motivational States

Telic		Paratelic	
Arousal avoiding	Goal oriented	Arousal seeking	Sensation oriented
Serious minded	Future oriented	Playful	Present oriented
Planning ahead	Prefer important activity	Spontaneous	Prefer unimportant activity
Attempt to complete activity		Attempt to prolong activity	
Mastery		Sympathy	
Willingness to compete	Desire for control	Willingness to cooperate	Desire for harmony, unity
Focus on toughness, strength		Focus on sensitivity	
		Autic	
		Concern w/ self	Concern w/ others
		Desire to gain	Desire to give
		Loss is unpleasant	Loss can be pleasant
		Not identifying w/ others	Identifying w/ others
		Egotistical	Altruistic
		Own feelings	Others’ feelings

Note: Adapted from Kerr et al.²¹⁾.

most aware of a particular motivational orientation, even if it is not his or her ideal state. This may affect decision making and behaviour, both in that interaction and others, which can potentially result in sub-par performance due to a mismatch between the performer's mindset and the demands of the situation.

Reversal Theory and Arousal

Alongside motivational states, reversal theory also addresses athletes' arousal levels and their effects on competitive performance. The most useful measure of arousal is the comparison of a performer's felt arousal with his or her preferred arousal level⁶⁾. The discrepancy between these two levels leads to *tension stress*, while the performer's coping response to redress the balance between felt and preferred arousal is termed *effort stress*. If a performer's effort stress is not effective at reducing the disparity between ideal and felt arousal levels, tension stress is likely to increase further and lead to a drop-off in competitive performance. Cox and Kerr⁶⁾ investigated the effects of winning and losing on arousal during a squash tournament and found that losing caused a significant increase in discrepancy scores (preferred minus felt arousal) whereas winners' discrepancy scores remained consistently small throughout the competition. Accordingly, the researchers concluded that performance failure is likely to increase the disparity between felt and preferred arousal, which in turn leads to increased tension and effort stress among performers.

The interpretation of arousal and its effect on performance is partly a function of the athlete's place along the telic-paratelic and negativistic-conformist continua at the time. To illustrate, performers in the telic state usually prefer a lower level of arousal; how this arousal is interpreted, however, is likely to differ according to whether they are in the conformist or the negativistic state. In the conformist mode, telic-operating athletes should feel somewhat relaxed with their preferred lower arousal level whereas a negativistic state is likely to evoke feelings of placidity. On the other hand, unpleasant heightened arousal in the conformist state will lead to increased anxiety; in the negativistic state, it will often generate feelings of anger¹⁹⁾. These emotions can sometimes elicit performance decrements, as an overly anxious athlete is more likely to have a narrowed field of attention and miss cues that are relevant to top-level performance¹⁵⁾. Anger is equally likely to incur a narrowing of attention while also causing the performer to make rash decisions

that deviate from the team's game plan. As a consequence, this may cause him or her to concede further penalties (and points), and in the worst case scenario, to be ejected from the match.

For an athlete operating in the paratelic mode, the preferred arousal level is likely to be higher than that of an athlete in the telic state. When coupled with the conformist state, this heightened arousal will induce a feeling of excitement whereas a combination with the negativistic state should cause heightened arousal to be associated with provocativeness¹⁹⁾. Conversely, an undesired low level of arousal can induce feelings of boredom for an athlete in the paratelic-conformist state and sullenness in paratelic-negativistic performers. Both of these undesirable emotions are likely to broaden the athlete's field of attention. This can cause an over-processing of irrelevant environmental cues at the expense of vital performance cues, which may lead to costly errors¹⁵⁾.

Kerr¹⁷⁾ suggests that if performers find themselves in an undesirable arousal state, arousal-inducing or reducing techniques can be used to return to their ideal level. The performer might also attempt to switch his or her position on the telic-paratelic continuum in order to experience the arousal differently, but this is not always easy to do and must be considered against the potential of a performance drop-off when moving out of one's ideal operating state. In the context of rugby union, the challenge for sport psychologists is to implement arousal management techniques and/or reversal-provoking methods that can be applied within the field of play during matches. By knowing one's most common tendencies, reversal theory can be applied by consultants in a manner similar to that of Hanin's¹³⁾ Individual Zones of Optimal Functioning (IZOF) to ensure that sports performers are in their preferred mindsets during competition. To explain, IZOF theory states that each athlete has an optimal and personal range of arousal that may be very different from that of other athletes. This narrow band is determined by administering an anxiety inventory before several performance events (or retrospectively after competition) and identifying the level that corresponds to the best performance. Athletes are then encouraged to use arousal control techniques to get into this optimal zone of functioning. Thus, IZOF and reversal theory both take a situational and individualized approach to the relationship between arousal and performance, and acknowledge that arousal can be both positive and negative to competitive athletes.

Sport research frequently highlights the importance of individual differences among competitors. At the same time, it has been suggested that more commonalities than differences exist between performers for motivational states in competitive settings¹⁴⁾. Thus, the aim of this study was to identify any individual or common effects on the motivation and/or arousal levels of professional rugby union players after conceding a costly penalty during competition. In the event that changes from the ideal state were demonstrated, a secondary purpose was to suggest psychological skills and techniques that might enable players to return to optimal levels.

On the basis of literature review, several non-directional hypotheses were proposed. It was predicted that players would differ in their optimal somatic states and that preferences could reflect any of the four somatic orientations. In contrast, similarities were anticipated in the transactional motivational states, with mastery expected to be the most common of the mastery-sympathy pair because of the physical nature of rugby. In addition, the alloic state was expected to be the most common preference within the autic-alloic pairing due to rugby union being a team game. A further prediction was that penalties would cause reversals between some of the motivational state pairs in some players, but no hypothesis was advanced as to which reversals would take place. Lastly, it was anticipated that penalties would lead some players to undergo changes in the salience of their motivational states, but again, no specific predictions were put forward.

With regard to arousal, conceding a penalty was expected to induce a change from the players' preferred levels. For example, players with a telic mindset (and who therefore prefer lower arousal) could be predicted to experience an arousal increase after conceding a penalty. For paratelic performers (who tend to prefer higher arousal), the opposite might be expected. These latter contingencies were based on the suggestions of Kerr¹⁹⁾ and the findings of Cox and Kerr⁶⁾, but there were no specific hypotheses on which arousal dimensions or which motivational states would be affected.

Method

Participants

Six professional club-level rugby union forwards were recruited for the study. They ranged in age from 21 to 33 years ($M = 26.3$, $SD = 4.22$), and all resided and played in the UK. Each participant had been playing rugby for at

least 10 years and three had international experience. All of the players were in possession of recent (2011-12 season) video footage of penalties that they had conceded inside their own half while playing for their clubs.

Video Footage

All of the participating players had access to video footage of their games through their clubs, and were asked to obtain footage in which they had conceded a costly penalty. The penalty sequence shown in each player's video clip occurred in his own half of the pitch and in the second half of the match, with the score between the two teams being within six points. These criteria had to be met in order to classify the selected infractions as "costly penalties." In addition, the penalty had to be for an infringement in which the player consciously/deliberately broke the rules (such as hands in the ruck) or in which he used improper (illegal) technique. Unfortunately, an error in data recording meant that no further information was available on the game situations in which penalties occurred or the perceived effects on eventual game outcomes.

Questionnaire

Each player completed a modified version of the State of Mind Indicator for Athletes (SOMIFA)^{3,20)} on two occasions. The SOMIFA was designed specifically for sport settings and has respondents indicate their current motivational state among all four state pairs as well as the state that is most salient at the time of performance. It also addresses athletes' arousal levels by asking respondents to rate themselves on the dimensions of excitement, alertness, and energy. The SOMIFA is typically completed after competition and has athletes answer the questions by thinking back about the events that just finished. In the present study, the first administration of the questionnaire served to determine players' optimal motivational states and arousal levels, while the second administration assessed post-penalty measures on these variables.

Procedure

In the first phase of data collection, all participants completed an adapted version of the SOMIFA questionnaire, which assessed how they felt in game situations when they performed at their peak or best level. This initial contact was carried out via telephone and/or email, after which the SOMIFA was sent to players electronically.

ly. As noted above, this first administration provided data on the players' optimal states, and the completed questionnaires were also returned electronically. Between one and two days later, the players then watched the video clip of themselves while conceding a costly penalty (as defined in the "Video Footage" subsection above), and were permitted to watch the clip as many times as they felt necessary to recall their thoughts and feelings at that time. They were then required to complete the SOMIFA again, but this time they were asked to answer in accordance with how they felt immediately after giving away the penalty. This second administration provided data on the players' post-penalty states, and the completed questionnaires were once again returned electronically.

Data Analysis & Presentation

Kerr et al.²¹⁾ state that, since the SOMIFA has no multiple-item subscales, statistical procedures for measures with subscales (such as item analysis, factor analysis, and item-to-subscale correlations) are inappropriate. In addition, consistent responses across situations would not be expected for such a state measure, meaning that test-retest reliability calculations are also considered to be inappropriate. Therefore, a qualitative approach was used here, showing contrasts between players' optimal and post-penalty motivational states and three dimensions of arousal. These contrasts were then presented as descriptive information, which should have practical value for players and coaches alike. The SOMIFA has previously been used in a similar manner with athletes competing in soccer^{10,11)} as well as in field hockey, rugby, basketball, judo, and dance²⁰⁾.

Results

Table 2 shows the optimal and post-penalty motivational states for each player. As predicted, there was considerable variation in optimal somatic (telic-paratelic and conformist-negativistic) states alongside an overall consistency in the transactional states—for the latter, all of the participants favoured the mastery mode and five of the six preferred an alloic orientation. Table 2 also reveals that motivational state reversals were triggered in three of the six players after conceding a costly penalty. That is, players 2 and 5 demonstrated reversals from the paratelic to the telic state, while player 5 exhibited an additional reversal from the negativistic to the conformist state. For player 4, conceding a penalty provoked a reversal from the mastery to the sympathy orientation. None of the participants experienced reversals within the autic-alloic pairing.

Table 3 presents the most salient motivational state for each player under optimal and post-penalty conditions. Five of the six participants reported a change in their most salient state following a costly penalty. Of those five, two players felt that their most salient motivational orientation switched from a somatic to a transactional state (i.e., player 2 went from a conformist to a mastery state, and player 6 moved from a telic to an autic state). In addition, two players switched from a transactional salient state to a somatic state (i.e., player 3 went from a mastery to a telic state, and player 5 moved from a mastery to a conformist state). Lastly, one participant reported that his most salient motivational state moved from one transactional pair to the other (i.e., player 4 became most aware of the alloic state despite reporting a tendency under optimal conditions toward the mastery state).

Table 2. Optimal and Post-Penalty Motivational States for each Player

Player	Optimal Somatic States		Post-Penalty Somatic States	
1	Paratelic	Conformist	Paratelic	Conformist
2	Paratelic	Conformist	Telic	Conformist
3	Telic	Negativistic	Telic	Negativistic
4	Telic	Negativistic	Telic	Negativistic
5	Paratelic	Negativistic	Telic	Conformist
6	Telic	Negativistic	Telic	Negativistic
Player	Optimal Transactional States		Post-Penalty Transactional States	
1	Mastery	Alloic	Mastery	Alloic
2	Mastery	Alloic	Mastery	Alloic
3	Mastery	Alloic	Mastery	Alloic
4	Mastery	Alloic	Sympathy	Alloic
5	Mastery	Alloic	Mastery	Alloic
6	Mastery	Autic	Mastery	Autic

Note: Reversals in motivational states are indicated in bold.

Table 3. Most Salient Motivational State for each Player under Optimal and Post-Penalty Conditions

Player	Most Salient State (Optimal)	Most Salient State (Post-Penalty)
1	Alloic	Alloic
2	Conformist	Mastery
3	Mastery	Telic
4	Mastery	Alloic
5	Mastery	Conformist
6	Telic	Autic

Note: Changes in the most salient state are indicated in bold.

With respect to arousal, Figures 1, 2, and 3 show changes in the excitement, alertness, and energy dimensions, respectively, after conceding costly penalties. Beginning with Figure 1, four players experienced a decrease in excitement and two players stated that their excitement level was unchanged following a penalty. Figure 2 indicates that five of the six participants expressed a preference for maximum alertness in the optimal state. After a penalty, however, the one player whose optimal level was below maximal reported an increase to the maximum rating. Three players felt that their alertness had decreased, while the remaining two stayed at the maximum level. Finally, Figure 3 shows that one participant reported an increase in energy after a penalty, two players showed decreases, and three felt the same level of energy as before.

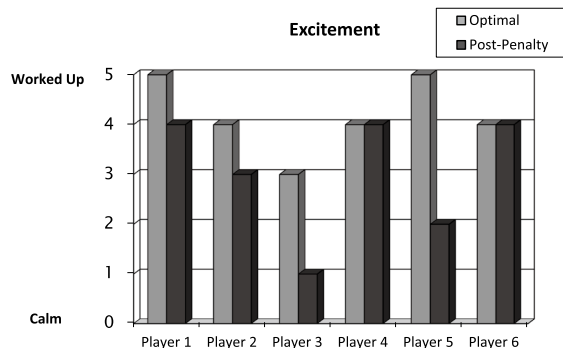


Figure 1. Change in excitement for each player between optimal and post-penalty conditions.

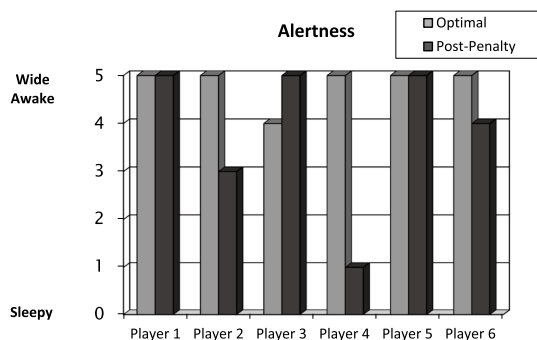


Figure 2. Change in alertness for each player between optimal and post-penalty conditions.

Discussion

As predicted, the results of this study suggest that conceding a costly penalty in professional rugby union is likely to affect players' mindsets immediately following the infraction. More specifically, psychological reversals were demonstrated for three out of the six participants, and five players revealed a change in their most salient motivational state. In addition, all of the players exhibited a change in at least one dimension of arousal. Although only descriptive, these preliminary findings underline a degree of individuality among the players as illustrated by their optimal somatic states. By the same token, the results also lend themselves to more general practical guidelines on situational game management for players, coaches, and mental training consultants. These guidelines will be outlined in the following discussion, with particular emphasis on the use of positive self-talk during matches.

The first point of discussion pertains to the fact that all of the participants reported optimal arousal levels toward the higher end of the three associated scales (excitement, alertness, and energy), regardless of telic or paratelic state involvement. This is in contrast to usual reversal theory dictates, which state that telic-oriented performers typically prefer lower levels of arousal. The most likely explanation for the reported pattern is that, as professional athletes, the three telic performers who expressed a preference for heightened arousal (players 3, 4, and 6) had learned over the course of their careers to perceive

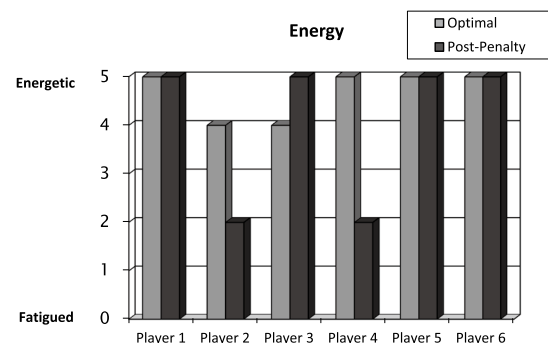


Figure 3. Change in energy for each player between optimal and post-penalty conditions.

competition-related tension stress as facilitative rather than debilitating, with correspondingly high effort stress to maximize coping effectiveness. Moreover, it is conceivable that high preferred arousal is consistent both with professional playing status and the physical nature of rugby itself. As such, the study's findings should be interpreted against this backdrop.

Dimensions of Arousal

Penalties indeed caused players to move outside of their preferred arousal levels. Four of the six participants reported a decrease in excitement, three players showed a reduction in alertness, and two had less energy after conceding a costly penalty. With respect to the energy findings, this may be partly due to methodological considerations and the fact that the video clips were all taken from the second half of matches, when fatigue was likely to be high (especially for those players in the starting line-up). Nevertheless, it may also reveal a cause behind some penalties in that the pain or discomfort of fatigue can be a source of distraction⁵⁾, with a compromising effect on technique²⁸⁾. To be sure, during play there are rarely breaks long enough to allow for sufficient physiological recovery. Therefore, players should consider using in-game psychological techniques to overcome the pain associated with fatigue⁵⁾, thereby reducing the likelihood of technical errors that, as mentioned earlier, often lead to penalties. To that end, Flor⁹⁾ suggests that positive self-talk can be effective as a means of pain management since positive thoughts have been shown to elicit greater pain tolerance.

The reduction in players' excitement is not surprising when one considers that the moments following an infraction are commonly accompanied by frustration, anger, and/or guilt—emotions that are inconsistent with the challenge, fun, and “excitement” of competing. The same can be said for the decreased level of alertness reported after penalties. At such times, it is not unusual for players to fret and obsess over the incident, which may render them less receptive or “alert” (even if only temporarily) to more important match-related cues. Accordingly, returning to optimal levels on both dimensions is necessary if players are to regain their form and minimize further damage. As is clear in Figures 2 and 3, one player (player 3) reported an increase in alertness and energy following the infraction, which may be indicative of a predisposition on this particular player's part to redouble efforts after setbacks. For the remaining (and perhaps

less resilient) players, though, positive self-talk can play a facilitative role once again by helping them refocus and approach the new circumstances with a “challenge” appraisal. This is corroborated by Landin and Herbert's²³⁾ assertion that effective self-talk includes statements that improve technique, offer encouragement, and increase effort.

Interaction of Motivational States and Arousal

Further to player 3, discussion of his broader profile illustrates the utility of reversal theory in elucidating athletes' cognitions and overall sport performance. To explain, this participant's post-penalty increases in alertness and energy were also accompanied by a decrease in excitement. Given that his preferred somatic operating state consisted of the telic (serious) and negativistic (rebellious) modes, this combination of states makes it possible that despite his presumed strengths (to redouble efforts after setbacks, as mentioned above), his post-penalty disposition may have been more unpleasant than the picture painted by his arousal scores and his predominant emotion may have been one of anger (as suggested by Kerr¹⁹⁾), which is not usually conducive to performance. In other words, while it may seem that player 3's arousal patterns showed the best capacity for adaptation, a closer look at the data provided by the SOMIFA suggests that an arousal reduction strategy could actually minimize further post-penalty errors by expediting a return to his pre-penalty state—a state more compatible with his telic and negativistic orientation (note that he did not experience any motivational state reversals). As before, positive self-talk and pre-determined cue words are practical strategy options as they can be employed during play and have been shown to reduce arousal¹²⁾. Deep breathing is an additional arousal reduction technique that can complement positive self-talk¹²⁾ and can be utilized in game settings.

The main point to be gleaned from the preceding discussion of player 3 is that to optimize performance following penalties or other in-event setbacks, arousal and motivation must be viewed not as orthogonal measures but as correlated and interacting constructs. Coaches and practitioners must also recognize that such interactions are often unique to each individual. To that extent, further discussion is warranted with respect to player 2, whose paratelic-conformist preference and documented decreases in all three dimensions of arousal were in stark contrast to the profile of player 3. Specifically, player 2

reported a post-penalty reversal to the telic state, the consequence of which (when combined with his decreases in felt arousal) was most likely a post-penalty disposition of boredom (as suggested by Kerr¹⁹⁾) rather than player 3's presumed feeling of anger. In this case, it is plausible that intentionally provoking a second reversal (back to a paratelic operating state) could be an effective method of combating the associated tension stress because the performer would then experience the lowered levels of arousal as relaxing and pleasant¹⁹⁾. As noted previously, however, this is not always easy, nor is it certain that the corresponding feelings of relaxation would result in optimal post-penalty performance. Thus, the recommended response for player 2 would be to engage in arousal-*inducing* strategies that raise post-penalty measures of excitement, alertness, and energy to pre-penalty levels. Again, self-talk and cue words could be used for this purpose²³⁾. Short-term goal setting might also be helpful, while positive self-talk and imagery have been shown to be effective with elite rugby players in particular²⁷⁾.

To recap, the contrasting cases of players 2 and 3 reveal that arousal levels and motivational state reversals are not so meaningful when viewed on their own. Instead, these measures must be viewed as a composite profile, and practical interventions should reflect the interactions between them; this applies both to adaptations after penalties and to performance overall.

With regard to transactional motivational states, all of the participants expressed a preference for the mastery orientation, as predicted. This is understandable due to the physical nature of rugby union and its classification as a contact sport. Similarly, five of the six players indicated a preference for the alloic state, which is equally understandable considering the cooperation and group goals that are inherent in team sports. Interestingly, though, only one post-penalty reversal was reported among the transactional state pairs, which can be taken to suggest that reversals are unlikely along the mastery-sympathy and autic-alloic continua. Again, this is most likely a reflection of the physical and team-oriented nature of rugby, phenomena which are most consistent with mastery and alloic dispositions. In any case, these findings provide useful information for coaches and mental skills consultants since they imply that the transactional states are less affected by the conceding of costly penalties and that under such circumstances, primary emphasis should be placed on managing athletes' somatic motivational states.

Motivational State Salience

Five of the six participants reported a change in their most salient motivational state after watching video footage of their infractions. The prevalence of these changes implies that conceding penalties caused players to refocus their motivational drive, but because there was no common direction for these changes, it is difficult to derive any broad practical suggestions from the reported patterns. Accordingly, the main recommendation is that players should consider devising and using self-talk and cue words which direct them toward the motivational state that functions best with the arousal measures within their personal performance profiles. At times this may mean doing relatively little intervention-wise, while at other times it may mean employing pre-determined self-talk and cue words that can trigger the most appropriate state. If this is the mastery state, for example, in which the player identifies with toughness and strength¹⁹⁾, cue words such as "dominate" or "win the physical battles" could be an effective strategy.

Limitations and Future Research

One limitation of the study was the small sample size, though this was not easily avoided as participants had to have access to video clips that met the aforementioned criteria. Nevertheless, with a larger group of participants, commonalities between performers might have been more easily discerned from the findings. The other main limitation stems from the fact that the research provided only descriptive information, which means that the arousal and motivational state patterns must not be interpreted as being statistically significant. Instead of drawing objective conclusions, the findings simply offer preliminary insights into a small group of rugby union players' cognitive experiences after conceding costly penalties. This information can serve as a springboard for new research questions and hypotheses, but the results cannot effectively be generalized to samples beyond this particular subset. Extended research can therefore provide a better understanding of arousal change and motivational state reversals by employing more rigorous methods of data analysis. Such follow-up study might also wish to examine the relationships between motivational state preference, reversals, and arousal by tracking players and teams over a series of several matches or over an entire competitive season.

Concluding Comments

Reversal theory in general and the SOMIFA in particular provide composite and athlete-specific profiles that address the interactions between arousal and motivational states after costly penalties in rugby. In fact, the SOMIFA presents as a useful tool that can be applied much like Hanin's¹³⁾ Individual Zones of Optimal Functioning (IZOF) approach by having players complete the questionnaire on several occasions and then identifying the data that best match players' optimal performance states. In some respects, it may even be preferable to IZOF due to its ease of administration and the multidimensional picture that emerges.

The variation in responses to both the optimal and post-penalty questionnaires also highlights the importance of tailoring psychological intervention techniques to the specific needs, preferences, and profiles of individual performers. Self-talk and cue words are strategies that can be implemented immediately after penalties, including during the ensuing play, to manipulate arousal and motivation. Other psychological techniques (when there are breaks or stoppages in play) include imagery and controlled breathing, but regardless of the strategy utilized, interventions should be personalized in order to maximize their effectiveness. They must also be practiced extensively in training so that players are confident in their effectiveness and competent in their application during competition.

Lastly, the use of reversal theory and the SOMIFA questionnaire is not necessarily limited to the effects of conceding penalties. This approach could also be beneficial for analyzing other in-game events within rugby union, such as preferred mindsets for goal kicking as compared to those for general play. The same holds true for a variety of situations in other team and individual sports.

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