

Sources of psychological states related to peak performance in elite table tennis players

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Abstract: The purpose of this study was to investigate the source of psychological states for peak performance in elite table tennis players. Semi-structured interviews were conducted with ten elite table tennis players (mean age = 20.90±1.85 years, mean sport years = 12.40±2.86), and the average duration of each interview lasted about 60 minutes. Content analysis was performed to analyze the qualitative data of transcribed verbatim obtained through individual face-to-face interviews. Optimal mental states were characterized by concentration, self-confidence, positive thinking, emotion management, and motivation through inductive analysis. Sources of concentration included sober-minded thinking, concentration on the present and seeking an opportunity to reverse. The sources of self-confidence were influenced by coaches' mental, tactical, and physical preparations before competition, belief in techniques, and social support. The sources of positive thinking included self-challenging and self-encouragement. Mental relaxation and competing as if just practicing were sources of emotional management. A desire to win and caring about results were the sources of motivation. These findings allow sport psychologists and coaches to target psychological skills to focus on and organize training programs for table tennis players.

Keywords: sources of psychological states, peak performance

1. INTRODUCTION

It is not easy to become an elite player. In addition to possessing technique, physical capability, and good physical condition, most importantly, players must have the ideal psychological qualities in order to achieve victory [20].

Salazar et al. [17] found that the psychological state several seconds prior to the execution of athletic skills is the key factor affecting skill performance [17]. Moreover, previous studies also indicated that, as opposed to ordinary athletes, elite athletes exhibited higher concentration during execution of skill [9, 12], which prevents athletes from being distracted by other internal and external stimuli. When athletes are completely absorbed in competition, their sport performance will be better [10, 15] and they will become more confident in their abilities.

Based on the aforementioned studies, good psychological states play an important role in competition. However, the sources of good psychological states are also important factors. According to the study conducted by Vealey [18], sources affecting confidence in players include mastery, exhibition ability, physical/psychological preparation, physical self-presentation, social support, coaches' instruction, alternative experience, environmental comfort and beneficial context. Many scholars have investigated the sources of self-confidence and explicitly indicated the sources of confidence. However, sources of psychological states, such as concentration, motivation, positive thinking, etc. have not been investigated in detail. Moreover, the psychological states of players in competition are affected by many

additional internal and external factors, and there are many sources, rather than just one variable. The purpose of this study was to understand the sources of psychological states of elite table tennis players during their best sport performance using semi-structured interviews with comprehensive questions. According to previous findings, we expected that the sources of psychological states related to peak performance in elite table tennis players would be related to concepts such as focusing on the present [13], coaches' instruction [8, 22], physiological and psychological preparation [8, 18], social support [8, 7, 18], positive self-talk [4, 6], commitment [13], and anxiety management skill [5], etc.

2. METHOD

2.1 Participants

We recruited five male and five female table tennis players who were selected to be in the national squad in 2008 and 2009. Excluded who were abroad, training schedule not met, and ranking fall behind in the group, five of the ten participants represented Taiwan at the 2010 world table tennis championship in Moscow.

2.2 Interview subject and procedures

The questions in the interviews were developed and designed based on a literature review in an attempt to probe into players' mindset and experiences, and to understand the source of psychological states during their best competition performances. Open-ended questions (Table 1) were designed according to the

study theme in order to guide participants in answering all the questions. Before being interviewed, every subject was requested to complete an informed consent form in advance. The average interview duration was approximately 60 minutes. In addition to written documentation, interviews were also recorded.

Table 1. Semi-structured interview questions

1.	Which game do you think was your best performance? Why and how?
2.	How you think and what were your attitudes? Where were those from? Why?
3.	Do you think concentration is one of the reasons that affect your best performance? How does it work? Where does it come from?
4.	Do you think self-confidence is one of the reasons that affect your best performance? What are its effects? Where does it come from?
5.	How did you feel in your best game? How does emotion affect your performance? Where did those come from?
6.	Were the coach's instructions effective during your best game? Why?
7.	Did you ever want to give up on inferior position during your best game? Why?
8.	What did you prepare in order to bring your skills into full play? Why?
9.	What did you gain after each competition? Why?
10.	Are there any external factors which affect your performance in your best game (physiological state, court, spectators, teammates, atmosphere, paddle, academic pressure, etc.)? How?
11.	Are there any other mental states which improve your competition besides what we discussed above? Why?

2.3 Data analysis

2.3.1 Preliminary analysis

The interviews were transcribed verbatim to ensure raw data integrity. After the transcripts were scrutinized, descriptions related to psychological states were marked with symbols and important missing information was completed according to the statements of the participants in order to more explicitly present description meanings. Moreover, a consensus was reached between the analysts so that contents could be preliminary encoded according to the order of interview outlines.

2.3.2 Inductive analysis

After preliminary encoding was completed, the transcripts were re-inspected, and similar descriptions were classified and named according to their meaning or representativeness. The principles we inducted the data was based on the grounded theory. We abstracted the

concepts according to one of the open encoding strategies called academic term. If our data conception fits into the definition of academic term (ex. concentration, motivation), we will use the academic term to categorize the psychological states. During this study, classification and names were constantly amended. The common nature shared by those in relevant classification was selected for further analysis. The researcher compared the results with those obtained from the two other analysts to revise inconsistencies, and the discrepancies were discussed until a consensus was reached.

3. RESULTS

3.1 Sources of concentration

“Concentration” refers to an individual focusing on the business he/she engages in without being disturbed by external irrelevant factors or affected by internal stimuli [2]. The sources included a total of 14 descriptions (Fig.1), including “sober-minded thinking,” “concentration on the present” and “seeking an opportunity to reverse.” When players are completely absorbed in competition and try to reverse the strategies used by opponents, they can better maintain sober-minded thinking and make efforts to do their best to reduce unnecessary mistakes.

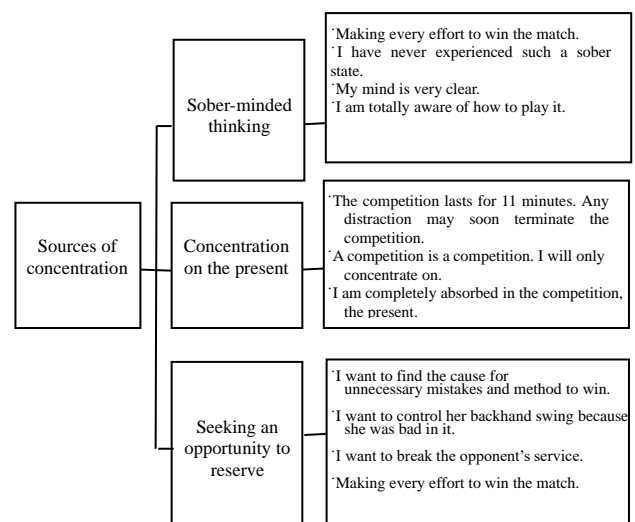


Fig. 1 Structural chart of the sources of concentration in table tennis players

3.2 Sources of self-confidence

“Self-confidence” refers to an individual’s belief in himself, and assurance in what he knows and is capable of, without feeling doubt about the things he does and the decisions he makes [2]. The sources included a total of 60 descriptions (Fig. 2), such as “coaches’ instruction,” “mental, tactical, and physical preparation before competition,” “self-belief in techniques,” and

“social support.” Among them, “coach’s instruction” refers to a coach’s on-site scrutiny of a player’s competition and provision of analysis and constructive suggestions after a match or during the time-out period that enables players to perform better in their next match. “Mental, tactical, and physical preparation before competition” refers to a player’s full skill training, tactical analysis, and mental/physical preparation before competition. “Self-belief in techniques” refers to a player’s belief in his own technique regardless of his opponent’s performance. “Social support” refers to the spiritual support and encouragement provided by family, friends, or teammates that allows players to increase their confidence.

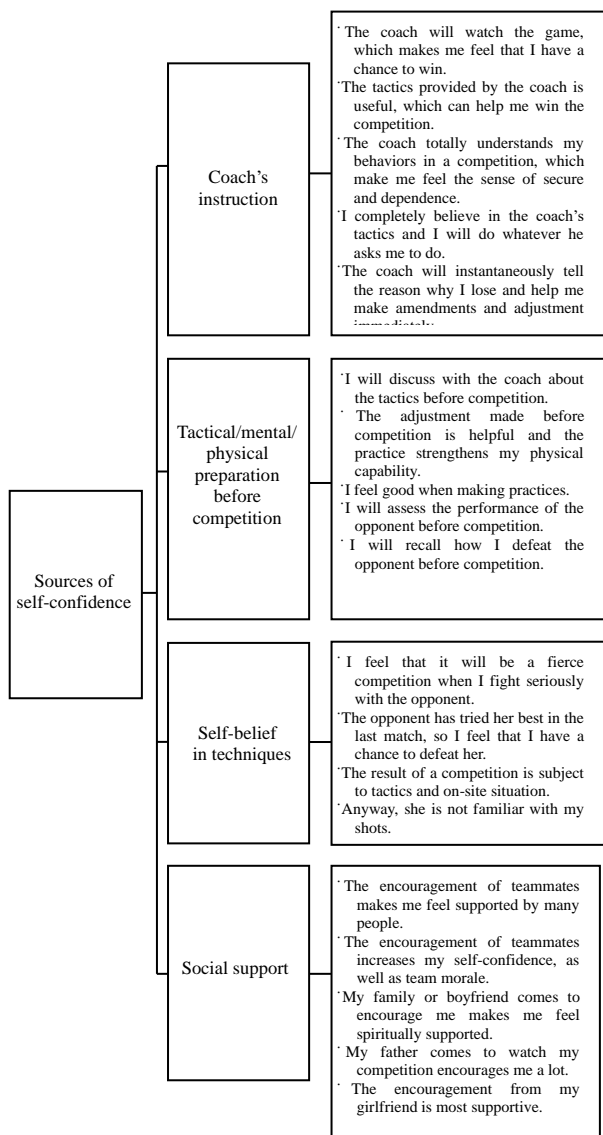


Fig. 2 Structural chart of sources of self-confidence in table tennis players

3.3 Sources of positive thinking

Some studies have indicated that when players use conversation or methods of self-encouragement in

competition, their thinking model becomes more positive and their anxiety decreases to enhance their sport performance [3, 11]. The sources include ten descriptions (Fig. 3), such as “self-challenge” and “self-encouragement.” When players intended to challenge themselves, they used positive words to encourage themselves, and during fail or loss, they tried to persuade themselves to not give up.

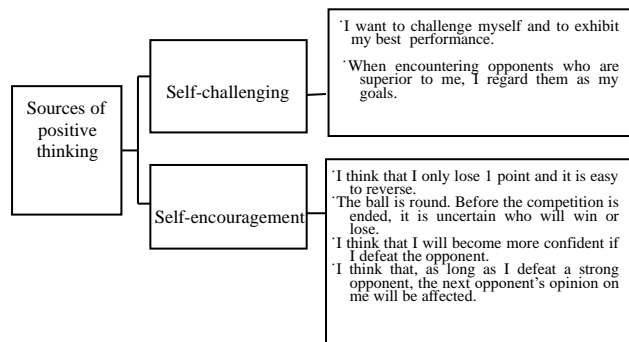


Fig. 3 Structural chart of sources of positive thinking in table tennis players

3.4 Sources of emotional management

“Emotion” is the sum of psychological changes, including cognitive appraisal, feelings, action impulsiveness, and explicit behavior, which are developed in order to deal with stimuli [19]. Therefore, when players’ emotions during competition cannot be instantaneously controlled and managed, their sport performance will be easily affected. There were six sources of emotional management (Fig. 4), including “mental relaxation” and “responding to a challenge normally”. When players respond normally to a challenge they are less likely to experience emotional upheaval. Additionally, during competition, they are less likely to experience high anxiety or negative emotions such as tension or rage, and can better maintain awareness and emotional responses, which are beneficial to sport performance.

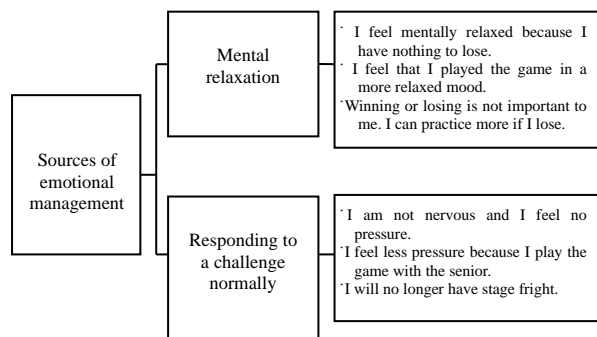


Fig. 4 Structural chart of sources of emotional management in table tennis players

3.5 Sources of motivation

“Motivation” is defined as the direction and strength of an effort [14, 23]. Motivation is very important in players, its preservation enabling players to maintain normal training and the motives to participate in competition. The 11 sources of motivation identified included factors (Fig. 4) such as “not accepting defeat and “caring about competition results”. Insistence and not accepting defeat motivates players to become stronger and more aggressive. In addition, because they care about competition results, they have a strong ambition to do their best.

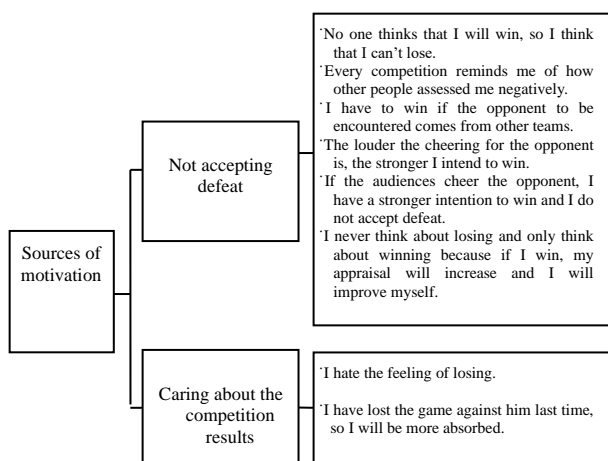


Fig. 5 Structural chart of the sources of motivation

4. DISCUSSION

The results found that the psychological states affecting the performance of elite table tennis players in competition include concentration, self-confidence, positive thinking, emotional management, and motivation. The sources of confidence included “coach’s instruction,” “tactical/mental/physical preparation before competition,” “self-belief in techniques,” and “social support,” which is consistent with findings from previous studies [8, 18]. Moreover, we found that “coach’s on-site instruction” was the major source of self-confidence in elite table tennis players. More than 80% of the participants indicated that their coach’s on-site instruction urges them to improve their performance. The sources affecting elite table tennis players’ positive thinking included “self-challenge” and “self-encouragement”. In addition to encouraging a positive attitude in players, positive thinking can also prevent players from developing negative ideas and triggers their positive behaviors in competition [3, 11]. Sources of emotional management included “mental relaxation” and “responding normally to a challenge.” If players fail to respond to a challenge and are excessively anxious, they may experience muscle tension, fatigue, and their motor coordination may be hindered [16]. The scope of attention and visual search may also be narrowed [21], which has a negative

effect on their sport performance in competition.

The sources triggering the motivations of elite table tennis players included “not accepting defeat” and “caring about competition results.” It is no easy feat to become an elite athlete; hence, players always hope to exhibit their best techniques to achieve victory, and win the approval of the general public. “Social appraisal” is one of the sources of successful performance in players, which includes positive feedback from the coach, teammates, family, and audience. It thus makes sense that elite players usually possess the attitude of not accepting defeat and always endeavoring to exhibit their best performance, in order to win positive appraisal from the public, proving and preserving their prowess and status. This also maintains individual motivation to continuously participate in training and competitions.

5. CONCLUSION

There were five optimal mental states (concentration, self-confidence, positive thinking, emotion management, and motivation) related to peak performance in elite table tennis players. The sources of concentration were: sober-minded thinking, concentration on the present, and seeking an opportunity to reverse. The sources of self-confidence were coaches’ instruction, mental, tactical, and physical preparation before competition, self-belief in techniques, and social support. Sources of positive thinking were self-challenging and self-encouragement and the sources of emotional management were mental relaxation and competing as if taking part in regular practice. Finally, sources of motivation were the desire for winning and caring about the outcome. These findings suggest that coaches and sport scientists can design training programs for elite table tennis players around building concentration, self-confidence, positive thinking, emotional management, and motivation with a focus on the sources for these mental states as discussed in the present research. Future research could develop a questionnaire to investigate table tennis players of a different skill level in order to better understand optimal mental states in performance. As the coach has a great influence on players, it is also important to promote the coach’s perception of players’ mental states in the field through the use of in-depth interviews.

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