A Study on the Factors of Choking of Golf Players: The Construction of Structural Model

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ABSTRACT

The aim of this investigation was to determine if the factors of choking mode of self-consciousness, sport anxiety, coping strategies and sport performance leading to the phenomenon of choking, which happens when athletes make mistakes at key points in the competition. The questionnaires were distributed to Taiwan excellent golf players and 79 valid questionnaires with a response rate 92% were collected and using PLS 2.0 for confirmatory factor analysis and structural equation model. The results show that the self-consciousness of golf players can influence their performance through coping strategies, and sport anxiety and coping strategies could directly affect the performance of players. According to the results of the study, golf players need to improve their self-consciousness and coping strategies in daily training.

Keywords: Golf players; self-awareness; Sport anxiety; coping strategies; sport performance

Introduction

Have regular physical activity is one of the best methods to improve people's emotional health, physical health, and psychological health (Li et al., 2009) and self-talk performance enhancement tool (Raalte, Vincent, Brewer, 2016). Golf is a one of the concentrations, stability, and precise sport for no matter the old, young, athletic, or sedentary (Andrea, 2018), and it was estimated the golf tourism market worth in excess of $20 billion (Humphreys, 2014). However, golf has been misunderstanding about it is the 'mental challenge' game and 'refers to the struggle to control the mind', but it really means 'I can't control my emotions" (Will, 2019). "Tournaments have handicaps to make us equal and in the short game everyone is equal' (Andrea, 2018), and the players used to resolve under extreme pressure from their favorite athletes, but surprising some fans from

losing of emotional control (Gregory, 2017) as "choking under pressure" (Weiss, & Reber, 2012). Building mental toughness and how to think about the athletes, encourage them will foster athlete's autonomy (Weinberg, Freysinger, & Mellano, 2016). The golfers face tremendous pressure at the crucial moment because of the external factors or the psychological results of the games.

Choking (Baumeister 1984; Baumeister et al. 1985; Baumeister et al. 1990; Baumeister & Steinhilber, 1984; Courneya, & Carron, 1990; Hardy et al., 1996; Tanner, & Sands, 1997) originally came from medical, with the meanings of obstruction and suffocation. However, Daniel (1981) is the first researcher who applied the choking phenomenon to sports psychology and advocated that the choking phenomenon represents a concept of game dysfunction or even victory or defeat.

Baumeister (1984) and Nideffer (1992) consider that the phenomenon of choking occur under the stress is associated with an increase in self-awareness. 'The process of a performance also influences the quality and the type of opponent' (O'Donoghue, 2009). When the contestants are under the pressure, they begin to generate self-awareness and lead the measures taken by the individuals that may cause disorder and resulting in the game errors as they are under the conscious control. In addition to self-awareness would

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increases physical anxiety (Nideffer & Sagal, 1998), the increase in anxiety (Gail, 2005) is also one of the causes of the choking phenomenon. The coping strategies adopted by athletes in competitions will influence subsequent behavioral responses (Gould et al., 1993). The athlete' inner thoughts and caring others' opinions might affect their sport performance in the competition. To effective use of mental skills require the skills is needed (Hamilton, Smith, & Brandon, 2020) to aware the relationships between golfers' self-awareness, sport anxiety, coping strategies, and sport performance. Therefore, this study takes Taiwan golf training players as the research objects.

Method

The sampling method is used by this study. A total of 100 golfers who participated in the training in Taiwan were distributed online and on-site from April 1st, 2018 to May 1st, 2018, and 21 invalid questionnaires were deducted. 79 valid questionnaires were recovered, and the effective recovery rate was 79%.

Research methods

The questionnaire of this study is divided into five parts: (1) Self-awareness scale (Fenigstein et al., 1975) divided into two dimensions, individual self-awareness and public self-awareness; (2) The sport anxiety scale (SAS) (Smith et al. 1990) divided into three dimensions, physical anxiety, worry and concentration disorder; (3) The COPE scale (Madden et al., 1989; Carver et al., 1989) divided into three dimensions, problem, emotion and escape; (4) The sport performance scale (Chang, 2012) is only a single dimension, with a total of three questions; (5) Background variables. Smart

PLS 2.0 statistical software package and confirmatory factor analysis and Structural Equation Modeling (SEM) are used to analyze the data.

Analysis of Confirmatory Factor Analysis (CFA), structural equation modeling (SEM) and verification results
Demographic variables

52 males, 65.8%, and 27 females, 34.2%, respondents were interviewed. 26 respondents, 32.9%, are under 20 years of age; 34 respondents, 43%, are 21–25 years old; 13 respondents, 16.5%, are 26–30-year-old; and 6 respondents, 7.6%, are the ages over 30 years of age.

There are 7 respondents, 8.9%, have been trained for less than 3 years; 15 respondents, 3%, have trained in 3 years (including) to 5 years; the majority of respondents 57 respondents, 72.2%, have been trained for more than 5 years. Respondents participated in the national competitions are 31, 39.2%, and 9 respondents, 11.4%, participated regional competitions; 31 respondents, 39.2%, won the national competitions and 8 respondents, 10.1%, won the regional competitions.

Confirmatory Factor Analysis, CFA

The Smart PLS 2.0 statistical package software was used to analyze the questionnaires in this study. Before conducting the model path analysis, the reliability and validity of each dimension was tested by confirmatory factor analysis. The measurement methods included factor loading, evaluation of measurement model, and discriminant validity. The evaluation of the model and the test of difference validity. The measurement results are shown as Table 1.

Table 1. **The estimated parameters of self-awareness measurement model**

Dimensions	Items	Factor loading	SE	T value	P value	CR value	AVE
Personal self-awareness	ISC1	.717	0.085	8.414	.000	.793	.490
	ISC2	.717	0.118	6.082	.000		
	ISC4	.692	0.066	10.462	.000		
	ISC6	.672	0.108	6.237	.000		
Public self-awareness	PSC1	.647	0.193	3.350	.001	.863	.682
	PSC3	.868	0.070	12.399	.000		
	PSC4	.936	0.038	24.799	.000		

Note: ISC = Personal self-awareness；PSC= Public self-awareness

Hair et al. (1992) pointed out that the factor loading is less than 0.4 is too low and greater than 0.6 is high; therefore, delete the factor loading of variables less than 0.6. The factor loading of each

item is between .647~.936 is convergence validity. In addition, Hair et al. (1998) suggested that the CR value should be greater than 0.7, and each facet is between .793~.863, showing internal consistency.

Average Variance Extracted (AVE) measures convergence validity and discriminant validity. Fornell and Larcker (1981) recommended 0.5 is as the standard. Each variable in this study is between .490~.682. After deleting the question 6 of individual self-consciousness, the individual self-awareness AVE is .587, which meets the recommended standard. The revised model estimation parameter shown as Table 2.

Table 2. **The Modified estimated parameters of self-awareness measurement model**

Dimensions	Items	Factor loading	SE	T value	P value	CR value	AVE
Personal self-awareness	ISC1	.742	0.104	7.146	.000		
	ISC2	.840	0.092	9.159	.000	.810	.587
	ISC4	.711	0.082	8.664	.000		
Public self-awareness	PSC1	.648	0.185	3.499	.001		
	PSC3	.867	0.071	12.144	.000	.863	.682
	PSC4	.936	0.042	22.042	.000		

Note: ISC = Personal self-awareness；PSC= Public self-awareness

The factor loading of each item in sport anxiety is between .760~.955, which means that each item is convergence validity; CR value in each dimension is between .896~.976, which showing internal consistency. In addition, AVE of each dimension is between .634~.889 that means each dimension is convergence validity, shown as Table 3.

Table 3. **The estimated parameters of sport anxiety measurement model**

Dimensions	Items	Factor loading	SE	t value	p value	CR value	AVE
Physical anxiety	BSA1	.788	0.104	7.605	.000		
	BSA2	.796	0.114	6.964	.000		
	BSA3	.820	0.060	13.763	.000	.896	.634
	BSA4	.816	0.098	8.295	.000		
	BSA5	.760	0.112	6.812	.000		
Worry	WSA1	.895	0.030	30.243	.000		
	WSA2	.903	0.026	34.672	.000		
	WSA3	.904	0.027	33.546	.000	.942	.766
	WSA4	.875	0.032	27.525	.000		
	WSA5	.795	0.065	12.178	.000		
Focus disorder	FSA1	.932	0.022	41.893	.000		
	FSA2	.940	0.018	51.518	.000		
	FSA3	.955	0.016	59.565	.000	.976	.889
	FSA4	.947	0.019	50.147	.000		
	FSA5	.940	0.016	57.425	.000		

Note: BSA = Physical anxiety；WSA = Worry；FSA = Focus disorder

The factor loading of each item in coping strategies is between .634~.858, which means that each item is convergence validity. CR value in each dimension is between.987~.934 that shows internal consistency. AVE of each dimension is between.589~681 that means each dimension is convergence validity, shown as Table 4.

The factor loading of each item in sport performance is between .861~.871, which means that each item is convergence validity. CR value in each dimension is .901 that shows internal consistency. AVE of each dimension is .753 that means each dimension is convergence validity, shown as Table 5.

Hair et al. (2006) suggested that the correlation coefficient between each dimension should be less than the square root of AVE, which represents the differences between the dimensions. According to the results of Table 6, the AVE of each dimension is greater than the correlation coefficient with other dimensions after the square root, which represents the differences between the various variables.

Note: The diagonal line is the square root of the AVE value, and the non-diagonal diagonal line is the correlation coefficient between the variables. This value is greater than the horizontal or vertical correlation coefficient value, which means that it is distinguishing validity.

Structural equation modeling (SEM) and verification results

After verifying the results of confirmatory factor and the overall models, the path coefficient and hypotheses are stated as following, The results of the causal path coefficient values for each potential variable in this study are shown in Table 7, and the significance test of each path is based on the t value > 1.96, a critical value. Self-awareness has affected the coping strategies, sport anxiety has affected coping strategies, and coping strategies has affected sport performance. The estimated impacts are .619, -.271, .312, and the significant p value is <.05.

Table 4. **The estimated parameters of coping strategies measurement model**

Dimensions	Items	Factor loading	SE	t value	p value	CR value	AVE
For the questions	QST1	.722	0.049	14.698	.000	.934	.589
	QST2	.819	0.043	19.257	.000		
	QST3	.771	0.049	15.863	.000		
	QST4	.736	0.062	11.869	.000		
	QST5	.825	0.052	16.008	.000		
	QST6	.836	0.040	21.017	.000		
	QST7	.789	0.054	14.580	.000		
	QST8	.808	0.049	16.658	.000		
	QST10	.712	0.067	10.656	.000		
	QST11	.634	0.085	7.459	.000		
For the emotions	EST1	.823	0.042	19.654	.000	.914	.681
	EST2	.840	0.057	14.664	.000		
	EST3	.781	0.073	10.717	.000		
	EST4	.858	0.034	25.557	.000		
	EST5	.821	0.051	16.090	.000		
Escape	AST1	.856	0.047	18.214	.000	.887	.664
	AST2	.854	0.056	15.244	.000		
	AST4	.802	0.089	8.977	.000		
	AST8	.744	0.108	6.881	.000		

Note: QST = For the questions; EST = For the emotions；AST = Escape

Table 5. **The estimated parameters of sport performance measurement model**

Dimensions	Items	Factor loading	SE	t value	p value	CR value	AVE
Sport performance	SP1	.871	0.038	23.258	.000	.901	.753
	SP2	.871	0.050	17.408	.000		
	SP3	.861	0.050	17.115	.000		

Note: SP = Sport performance

Table 6. **Differential validity of each variable**

	AST	BSA	EST	FSA	ISC	PSC	QST	SP	WSA
AST	.815								
BSA	.326	.796							
EST	-.191	-.060	.825						
FSA	.493	.576	-.204	.875					
ISC	-.148	-.148	.487	-.221	.766				
PSC	.141	.464	.000	.314	.062	.826			
QST	-.157	-.159	.673	-.266	.597	.078	.768		
SP	.059	-.256	.418	-.266	.330	-.100	.445	.868	
WSA	.163	.626	-.115	.648	-.169	.476	-.243	-.420	.943

Note: ISC = Personal self-awareness；PSC = Public self-awareness；BSA = Physical anxiety；FSA = Focus disorder；

WSA = Worry；QST = For the questions；EST = For the emotions; AST= Escape; SP= Sport performance

Table 8 shows the path directly and indirectly affects the relationships between the various dimensions. It is found that the self-awareness has a positive influence on the coping strategies, the coefficient value is .619, and the indirect influence coefficient can be indirectly affected by the coping

strategies. The indirect coefficient value is .193, which is presumed the golfers are particularly concerned about their sport performance when facing the games. However, when the players have high self-awareness, they will definitely adopt some strategies to improve their sport performance and avoid the faults during the games. This result is similar to the results of Kwok and Lloyd (2014) stated that when the individuals are highly self-awareness, they will be more active in adopting strategies to improve problems and conditions.

Table 7. **The path coefficient of dimensions**

Variable path	Standardization coefficient	SE	t value	p value
Self-awareness -> Sport anxiety	-.224	0.395	0.567	.571
Self-awareness -> Coping strategies	.619	0.231	2.681	.008
Sport awareness -> Sport performance	.083	0.131	0.632	.528
Sport anxiety -> Coping strategies	-.129	0.157	0.825	.410
Sport anxiety -> Sport performance	-.271	0.123	2.207	.028
Coping strategies -> Sport performance	.312	0.103	3.041	.003

Table 8. **Direct and indirect influence between various dimensions**

	Sport anxiety		Coping strategies		Sport performance		
	Directly	Indirectly	Directly	Indirectly	Directly	Indirectly	Total Effect
Self-awareness	--		.619	--	--	.193	.193
Sport anxiety			--		-.271	--	-.271
Coping strategies					.312		.312
R^2	. 050		.435		.267		

Sport anxiety has a negative impact on sport performance. The coefficient value is -.271. In this study, it is considered that the golfers often care about their own performance and status in the competitions, whether their opponents' performance exceeds themselves, or are afraid of they cannot perform normally that caused the degrading concentration or physical discomfort. The psychological factors would affect golfers 'physical conditions, as the results of Patel, Omar and Terry (2010) pointed out that when athletes are over-anxious, it is not conducive to sport performance. The coping strategies have a positive impact on sport performance. The coefficient value is .312. In the face of various pressures of the games, if the players intentionally take countermeasures, it will definitely change the performance of the sport performance. The coping strategies are divided into evasion and confrontation. If the golfers take evasive behavior, they will avoid thinking too much and will be able to generate lower anxiety. If golfers face of behavior, the players will use experience in the past to solve the immediate problems and improve their performance. This result is related to Nsajadi, KhanMohamadi, Eskandari, Heidary and Darbani (2011) that indicated the athletes' coping strategies are significantly correlated with sport performance. However, according to the above results, only H2, H5 and H6 are established in this study, shown in Table 2, and the path pattern diagram is shown in Figure 1.
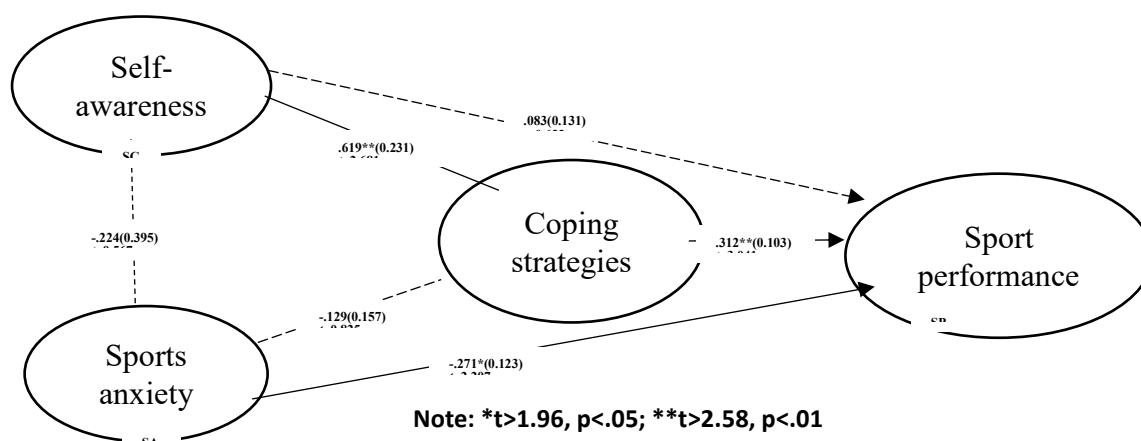

Note: *t>1.96, p<.05; **t>2.58, p<.01

Figure 1. **Path pattern diagram**

According to Table 9, Cronbach's α is between .643 and .952, which means that the reliability of each dimension is acceptable. R2 of each variable in the model are .050, .435 and .267, respectively. According to Martin, Gaby and Claudia

(2009), when the GOF value exceeds 0.36, the goodness-of-fit test of model is good. In this study, the GOF value is closed to .360, which means that the research model has a moderate to good goodness-of-fit test.

Table 9. **The goodness-of-fit**

	AVE	Composite Reliability	R Square	Cronbach's Alpha	redundancy	GOF
Self-awareness	.284	.643		.588		
Sport anxiety	.576	.952	.050	.945	.028	.352
Coping strategies	.368	.869	.435	.874	.019	
Sport performance	.753	.902	.267	.836	.096	

According to Table 10, the hypothesis of H2, H5 and H6 are established and coping strategies has an

intermediary effect in this model, that is, the player's self-awareness can influence the sport performance through the response strategy.

Table 10. **The hypothesis verification results**

Research hypothesis	Results
H1：The golf trainers' self-awareness has significant impact on sport anxiety	Non- Established
H2：The golf trainers' self-awareness has significant impact on coping strategies	Established
H3：The golf trainers' sport anxiety has significant impact on coping strategies	Non- Established
H4：The golf trainers' self-awareness has significant impact on sport performance	Non- Established
H5：The golf trainers' sport anxiety has significant impact on sport performance	Established
H6：The golf trainers' coping strategies has significant impact on sport performance	Established

Conclusions

The purposes of this study are to explore the influencing factors of the choking phenomenon on golf training players. Based on the results of the literature discussion, the causal relationship between self-awareness, sports anxiety, coping strategies and sports performance are discussed as the framework of this study. Based on the research results, the conclusions are as following,

A. The relationship between golfers' self-awareness, sport anxiety, coping strategies, and sport performance.

(1) The golf trainers' self-awareness has significant impact on coping strategies, which presents that the golfers aware their emotions are gradually uneasy, they will take the appropriate way to calm and think the appropriate treatment and seek the assistance of others or escape from the state of mind and behavior to response the situation that they faced.

(2) The sport anxiety of golf trainers has a negative impact on sport performance. Golfers usually face extreme pressure before the games, and are therefore prone to physical discomfort, such as stomachache, limply, tighten, etc. and worry about their performance would affect the concentration of the games that will easily affect the performance of the games.

(3)

(4) The coping strategies of golf trainers have a significant impact on sport performance. When players face high-pressure competition environment, they will take corresponding measures, such as carefully thinking about the causes of problems, facing problems based on past experiences, and discussing with others. Seeking help or even negating a negative attitude is a way of coping strategies, and its purpose is to improve the existing situation and improve the athletic performance.

B. Golf trainers have a good goodness-of-fit on self-awareness, sport anxiety, coping strategies and sport performance models.

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