Sources of Sport Confidence, Imagery Type and Performance among Competitive Athletes: The Mediating Role of Sports Confidence

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ABSTRACT

Aim. This study explored the mediating role of sport confidence upon (1) sources of sport confidence- performance relationship and (2) imagery- performance relationship.

Methods. Participants were 157 competitive athletes who completed state measures of confidence level/ sources, imagery type and performance within one hour after competition.

Results. Among the current sample, confirmatory factor analysis revealed appropriate support for the nine-factor SSCQ and the five-factor SIQ. Mediational analysis revealed that sport confidence had a mediating influence upon the achievement source of confidence – performance relationship. In addition, both cognitive and motivational imagery types were found to be important sources of confidence, as sport confidence mediated imagery type-performance relationship.

Conclusion. Findings indicated that athletes who construed confidence from their own achievements and report multiple images on a more frequent basis are likely to benefit from enhanced levels of state sport confidence and subsequent performance.

Key words: Confidence, Imagery, Athletic

Introduction

The study of self-confidence in sport has primarily been couched within Bandura's[1] self-efficacy theoretical framework. Undoubtedly, this approach has enhanced knowledge and facilitated the development of applied interventions in order to ameliorate self-confidence beliefs among various athletic population groups. It should be noted that Bandura's[1] generic conceptualization of self-efficacy has been deployed universally across various sub-disciplines of psychology (e.g., health, occupational, and developmental). In further attempting to understand self-confidence in sport, over two decades of research led by Robin Vealey and colleagues has culminated in the development of an integrated model of sport confidence (see Vealey & Chase, 2008 for a review)[2]. According to Vealey[3], "the model should serve as an organizational framework to elicit meaningful extensions to the research examining confidence in sport, and it should also serve as a foundation for interventions designed to enhance confidence in athletes" (p. 555). However, over a decade later, there has been minimal empirical research testing elements of Vealey's[3] proposed model. If the predictions offered by the integrated model are to inform sport specific confidence-based interventions, it is necessary for scholars in the sport psychology research community to empirically investigate the conceptual underpinnings proposed by Vealey's framework.

Vealey's[3] integrated model of sport confidence builds upon her earlier conceptualization of sport confidence[4]. Key features of the integrated model concern core psychosocial constructs predicted to influence sport performance. Specifically, sport confidence lies at the heart of the model and is sourced from three higher order domains of confidence (achievement, self-regulation, and social climate). A unique feature of Vealey's[3] model was the introduction of affect, behaviour and cognition. The ABC triangle, as it is known, is an important part of the model as it represents a reciprocal mechanism for how

sports confidence influences performance. A final key feature of Vealey's[3] model was the acknowledgement that organizational culture, personality and demographic characteristics can influence the core psychosocial constructs, in particular sources and levels of sport confidence.

According to Bandura[1], sources of self-efficacious beliefs, namely the perceived capability to execute a given course of action, are a product of complex cognitive processes of self-appraisal and self-persuasion. Similarly, sport confidence beliefs, that are the degree of certainty in one's ability to perform successfully in sport[3], rely on the cognitive processing of diverse sources of sport confidence information. Sources of sport confidence are central to Vealey's[3] integrated model of sport confidence. This model comprises of nine sources of confidence that are represented by three higher-order dimensions; (1) *achievement*: gaining confidence from goal attainment (e.g., mastery, demonstration of ability), (2) *self-regulation*: gaining confidence from effectively regulating cognitions, emotions and behaviors (e.g., physical/ mental preparation, physical self-presentation), (3) *social climate*: gaining confidence from a positive and achievement nurturing environment (e.g., social support, vicarious experience, coach's leadership, environmental comfort, situational favorableness).

Support for the 9-factor first order sources have been documented by Vealey, Hayashi, Garner-Holman, and Giacobbi[5]. Using the Sources of Sport Confidence Questionnaire (SSCQ), Vealey and colleagues identified mastery, social support, physical/ mental preparation and demonstration of ability to be the top five sources of sport confidence used by high school athletes. Physical self-presentation was the least important source. Vealey et al.'s findings[4], however, comprised of younger level athletes, so their findings cannot be readily generalized to other athletic population groups. As such, Wilson, Sullivan, Myers, and Feltz[6] attempted to extend Vealey et al.'s[5] findings, using the SSCQ, with a

sample of masters' level athletes. Using confirmatory factor analysis, findings did not support the 9-factor structure first order sources of sport confidence. However, exploratory factor analysis did find an acceptable 8-factor structure, excluding situational favorableness. Other research investigating salient sources of confidence has primarily been undertaken within Bandura's self-efficacy theory[1]. For example, enactive mastery experiences, modeling, and verbal persuasion have been positively associated with self-confidence[2]. However, other sources of confidence have been identified over and above those stipulated by Bandura[5,6]. With the exception of Wilson and colleagues[6] there is a lack of quantitative research investigating sport specific sources of confidence as operationalized by Vealey's[3] integrated sports confidence model.

Two key tenets proposed by Vealey's[3] integrated sports confidence model were (1) sources of confidence directly predict sport confidence levels, and (2) sources of confidence have an indirect effect upon performance through the mediational influence of sport confidence. Upon investigating the first proposed relationship, Vealey et al.[5] found physical/ mental preparation to have a positive linear relationship with trait sport confidence whereas environmental comfort and physical self-presentation were negatively related. Upon extending Vealey et al.'s[5] findings, Wilson et al.[6] found physical/ mental preparation and demonstration of ability to be statistically significant positive predictors of trait sport confidence. Wilson and colleagues[6] concluded the aforementioned sources were more likely to provide masters level athletes with a sense of greater confidence. Despite the value of this finding, the homogenous nature of the sample implies such findings cannot be generalized to other athletic population groups. As such, further research, using the SSCQ, is required that utilizes a heterogeneous sample of competitive athletes. Of note, Wilson and colleagues[6] did not investigate the indirect effect of confidence sources upon performance, via sport confidence, as proposed by Vealey[3]. Indeed, research of this nature is generally lacking in

the sport psychology literature. This is somewhat surprising given there is a growing body of evidence that suggests confidence to be a central mediating factor in achievement settings[7,8]. Therefore, research is required investigating the mediating role of sport confidence upon the sources of confidence-performance relationship. Research of this kind would help inform interventions as to the most salient sources of confidence relevant to enhancing confidence levels and subsequent sport performance.

Moran[9] described imagery as internal representations of information without the stimulus present. Internal representations can be aligned with imagery content, or what an individual actually images[10]. Based upon Paivio's[11] notion that imagery serves as having both cognitive and motivational components, Hall, Mack, Paivio, and Hausenblas[12] classified and identified five types of imagery content; (1) *motivational specific*: specific goals and/ or goal-oriented behaviors, (2) *motivational general-mastery*: effective coping and mastery of challenging situations, (3) *motivational general arousal*: emotional and somatic experiences, (4) *cognitive specific*: mental rehearsal of specific athletic skills, (5) *cognitive general*: mental rehearsal of athletic strategies/ tactics. In operationalizing imagery types, Hall et al.[12] developed the Sports Imagery Questionnaire (SIQ). Results from their preliminary psychometric analysis of this scale, found this instrument to be both reliable and valid.

According to Martin, Moritz, and Hall[13], imagery type is associated with desired athletic outcomes from using imagery. The term imagery outcome has more recently been used to denote the end result of the imagery process[14,10]. One such imagery outcome is enhanced sport confidence. In view of the importance of sport confidence in relation to athletic achievement, there is a plethora of research investigating the direct relationship between imagery type and self-confidence levels. Martin and colleagues[13] asserted motivational imagery types would help develop, maintain and regain sport confidence.

Numerous investigations have supported Martin et al.'s contention[15,16,17]. Although, Abma, Fry, Li, and Relyea[18] concluded the use of all types of imagery, not exclusively motivational, can lead to increased trait sport confidence. This was based on their findings that revealed high sport confident track and field athletes significantly utilized MS, CG and CS imagery types than their lower sport confident counterparts. In view of these equivocal findings, it is necessary for further research to clarify imagery type-confidence relationship. This would ensure athletes employ the most appropriate type(s) of imagery in order to facilitate enhanced sport confidence.

One would intuitively assume that enhanced feelings of confidence, as a result of implementing an effective imagery strategy type, would translate into enhanced performance. However, there is a dearth of research exploring the indirect effect of imagery type upon performance, via the mediating role of sport confidence. This is because imagery research has primarily focused on investigating imagery type as an independent variable and confidence as the dependent variable[19]. If imagery interventions are to be optimally effective, it is necessary to determine whether desired outcomes (e.g., increased confidence) have a facilitative influence upon athletic performance. In their review of imagery research in sport, Callow and Hardy[19] identified that it is not yet fully appreciated whether confidence mediates the imagery-performance relationship and, therefore, advocated this as a future research recommendation. One exception is Nordin and Cumming's[20] experimental study investigating whether self-efficacy (a specific form of self-confidence) mediated imagery type-performance relationship. Findings revealed no significant mediation. To date, the broader concept of sport confidence has not been considered, therefore, Callow and Hardy's[19] recommendation remains.

Overall, the sport psychology literature has predominantly investigated confidence as both a predictor and criterion variable. However, investigations exploring the mediating role

of sports confidence with respect to sources of confidence, imagery and performance are scant. Accordingly, this study primarily aims to investigate the mediating role of sport confidence upon the sources of sport confidence-performance relationship and imagery type-performance relationship. Specifically, we hypothesized sport confidence would positively mediate the two aforementioned relationships. It should be noted that sources of confidence and imagery types are multidimensional constructs. At a multidimensional level, due to the lack of research, we cannot hypothesize specific indirect relationships of these constructs upon performance, through the mediational effect of sport confidence.

Materials and Methods

Participants

The sample consisted of 157 competitive athletes (118 male and 39 female) with a mean age of 21.94 (*SD* = 5.62). Participants competed at international/ national/ (*n* = 11), county (*n* = 40), club/ university (*n* = 93) and beginner (*n* = 13) standard. Athletes took part in team (*n* = 127) alongside individual sports (*n* = 30) who were of Caucasian (*n* = 136), Asian (*n* = 3), black (*n* = 11) or from another ethnic group (*n* = 7). All participants provided consent prior to the study commencing.

Questionnaires

Sources of Sport Confidence. The Sources of Sport Confidence Questionnaire (SSCQ)[4] assessed confidence sources. The SSCQ is a 43-item instrument that examines 9 confidence sources, categorized into three higher-order dimensions. These include 1) *achievement* (mastery, demonstration of ability), 2) *self-regulation* (physical/ mental preparation, physical self-presentation), 3) *social climate* (social support, vicarious experience, coach's leadership, environmental comfort, situational favorableness). The SSCQ is scored on a 7-point Likert-type scale ranging from 1 = *not at all important* to 7 = *of highest importance*. Athletes rated how important each of the sources created a feeling of self-confidence after competing in

sport. Exploratory findings have found the SSCQ to have adequate factor structure and reliability alpha coefficients[4].

Imagery Type. The Sport Imagery Questionnaire (SIQ)[12] was used to assess imagery type. The 30-item SIQ involves participants rating the frequency with which they engage in 5-imagery types: 1) *motivational specific*, 2) *motivational general mastery*, 3) *motivational general arousal*, 4) *cognitive specific*, 5) *cognitive general*. All of the items on the SIQ are rated on a 7-point Likert-type scale, ranging from 1 = *rarely* to 7 = *often*. The SIQ has previously been shown to have adequate psychometric properties and internal reliabilities[12].

Sport Confidence. Participants rated their global level of sport confidence by responding to the question "How confident were you in your own ability to perform successfully today" on a scale anchored from 1 = *not at all confident* to 10 = *extremely confident*. Single-item scales of this kind have been used previously[21].

Perceived Performance. Participants subjectively rated their own performance following competition by responding to the question "Compared to your typical performance, please rate your own performance today" on a scale anchored from 1 = *worst I could play* to 10 = *best I could play*. This type of scale has been used by Dewer and Kavussanu[22], in addition, when sample sizes are relatively large and heterogeneous use of subjective performance indices has been advocated[23].

Procedure

After ethical approval was obtained by a University Research Ethics Committee, research assistants recruited athletes engaging in a competitive part of the season across university campuses and various sports clubs. Athletes who wished to partake in this study were sent an information letter, to detail the nature of the study, and were required to provide informed consent. Participants completed the SSCQ, SIQ, and single-item confidence and

performance instruments within one hour following competition. Questionnaire completion required approximately 15-20 minutes.

Data Analyses

Preliminary analysis included screening data for missing values, outliers, skewness, kurtosis, multivariate normality and multicollinearity. Multicollinearity was checked by calculating tolerance (1/VIF). Composite reliability and descriptive statistics were calculated on all study variables. Composite reliability was preferred to the commonly used Cronbach's alpha coefficient after Raykov[24] demonstrated that it is less likely to underestimate scale reliability. Factor structure of the SSCQ and SIQ was examined using confirmatory factor analysis, and where appropriate, exploratory structural equation modeling.

Bivariate correlations were used to firstly investigate the relationships between imagery, confidence, and performance variables. Hierarchical regression analyses were used to examine the predictive relationships of (1) sources of sport confidence on confidence and performance, and (2) imagery types and confidence on performance. We also explored mediation effects in both models. Specifically, we examined the indirect effects of sources of sport confidence on performance, mediated by confidence, and imagery use on performance, again mediated by confidence. To establish whether mediation had taken place, we examined bootstrapped confidence intervals. The absence of zero in the lower bound supports an effect. For the substantive significance, we used Preacher and Kelley's[25] Kappa-squared. Finally, we present significant findings in accordance with Sobel's test.

Results

There were no missing data, outliers, or issues with skewness (< 2), kurtosis (< 2), or multivariate normality (< 10). There were also no signs of multicollinearity (1/VIF < .1). The reliability for all SIQ subscales were considered good, using the generally accepted criterion

of .70. With the exception of situational favorableness (CR = .66), reliability was good for all first order SSCQ subscales. However, results pertaining to the higher-order achievement (CR = .62) and self-regulation (CR = .52) subscales should be treated with care. Confirmatory factor analyses were conducted for the SSCQ as a nine-factor model and the higher-order dimensions of achievement, self-regulation, and social climate in a three-factor model. Model fit for the nine-factor model was a little problematic: $\chi^2(824) = 1615.8$, CFI = .80, TLI = .78, SRMR = .09, RMSEA = .08 (90% CI = .07-.08). In a nine-factor, higher-order model, one might expect many non-significant cross-loadings. As such, the tough constraints of CFA might not be appropriate[26]. To account for this, we then conducted exploratory structural equation modeling (ESEM). This improved model fit to borderline acceptable: $\chi^2(552) = 1033.4$, CFI = .88, TLI = .80, SRMR = .03, RMSEA = .08 (90% CI = .07-.08). The higher-order three-factor model did not fit well, even in ESEM: $\chi^2(777) = 2248.8$, CFI = .63, TLI = .57, SRMR = .08, RMSEA = .11 (90% CI = .11-.12). A further CFA was conducted for on the SIQ and demonstrated reasonable model fit: $\chi^2(357) = 666.2$, CFI = .90, TLI = .87, SRMR = .06, RMSEA = .07 (90% CI = .07-.08).

Correlational analysis of the sources of sport confidence subscales revealed that only five of the nine subscales significantly positively related to confidence (Table 1). However, all imagery types demonstrated a significant positive correlation with confidence (Table 2).

For the hierarchical regression analyses (Table 3), we firstly examined the effect of sources of sport confidence on reported confidence. At step 1 we entered gender, age, and skill level. This revealed a significant effect for gender ($\beta = -.17$, $p < .05$), as such being female was associated with lower levels of confidence. Although age and skill level had no significance in the first step, a total of 6.7% of confidence variance was explained ($F_{3,153} = 3.66$, $p < .05$). For the second step, we entered the sources of sport confidence. A total of 21% of confidence variance was explained ($F_{12, 144} = 3.20$, $p < .001$). Gender became non-

significant in the second step (β = -.14, p >.05), however, age became significant (β = .18, p < .05). The sources of sport confidence variables entered in step 2 explained an additional 14.3% of confidence variance ($F_{9, 144}$ = 2.91, p <.01). However, out of the nine sources of confidence, only demonstration of ability (β = .22, p < .05) positively predicted confidence. Next, we assessed mediation by examining the direct and indirect effects of the higher-order sources of sport confidence on performance, mediated by confidence (Table 4). There was no relationship, direct or indirect between self-regulation and performance. There was a small direct (b = .06, p < .05) and indirect effect (b = .03, p < .05) for social climate on performance, though this was of little substantial relevance ($_K^2$ = .077). More substantive was the direct (b = .17, p < .01) and indirect (b = .08, p < .01) effects of achievement on performance.

Our second hierarchical regression analysis (Table 5) again entered gender, age, and skill level in the first step. Similarly, there was a significant effect for gender (β = -.17, p < .05), age and skill level had no significance in the first step. In total 6.7% of confidence variance was explained ($F_{3,153}$ = 3.66, p < .05). At step 2 we entered the imagery types identified by the SIQ. A total of 27.3% confidence variance was explained ($F_{8, 148}$ = 6.95, p < .001). In this step gender became non-significant (β = .10, p > .05) and the other demographic variables remained non-significant. The imagery type variables entered in step two explained and additional 20.6% ($F_{5,148}$ = 8.40, p < .001), with motivational specific (β = .25, p <. 05), motivational arousal (β = -.31, p < .05), and motivational general mastery (β = .35, p < .01) being statistically significant. Next, we assessed mediation by examining the direct and indirect effects of imagery type on performance, mediated by confidence (Table 6). Although only motivational specific presented a significant direct effect on performance (b = .24, p < .01), all indirect effect estimates were significant. The effect size of the

motivational general arousal indirect was relatively small (κ^2 = .071), but for all of the other imagery types was more substantive (κ^2 = .116 - .147).

Discussion

The main purpose of this study was to investigate the mediating role of sport confidence upon the sources of confidence- performance relationship and the imagery-performance relationship. Findings revealed sport confidence mediated the relationship between achievement/ social climate, higher order sources of confidence, and performance. However, only achievement had a substantial effect size, social climate was very minimal. In addition, sport confidence also significantly mediated the relationship between imagery type and performance. Although MG-A imagery had a weak effect size, the remaining imagery types, CS, CG, MS, MG-M had a more substantive indirect effect upon performance, via sport confidence.

To date, scant attention had been directed at exploring the proposed hypothesized relationships purported by the integrated model of sport confidence[3]. One such hypothesis was that sources of sport confidence would directly predict sport confidence levels. The current study found demonstration of ability to be the only source of confidence that predicted confidence. That is, athletes being able to demonstrate their ability predicted higher levels of state sport confidence. Previous research[27] has found demonstration of ability to be ranked the most important source of confidence leading up to competition in a sample of elite athletes. Although it was not possible to determine the relationship between confidence sources upon state sport confidence, Kingston et al[27] found athletes' used demonstration of ability as a source of confidence three weeks, two weeks and one week prior to competition. The current study assessed confidence sources within one hour after competition and therefore provides some support for Kingston and colleagues[27]. In addition,

the present study suggests athletes who gain confidence from demonstrating ability prior to competition would have higher levels of state confidence. However, some caution is warranted when interpreting this finding. For instance, it has been acknowledged that demonstration of ability can be an uncontrollable source of confidence given its emphasis upon being other-referenced (i.e., demonstrating more skill than the opponent). As such, confidence generated from this source maybe unstable and transient in nature. It is important, therefore, future research conducts longitudinal research to assess the temporal patterning of confidence sources and their impact upon state confidence pre, during and post competition.

Another key hypothesis purported by Vealey's[3] integrated model asserted that sources of confidence have an indirect effect upon performance through the mediational influence of sport confidence. The present study found some support for Vealey's[3] assertion, in that sports confidence mediated the relationship between achievement, a higher order source of confidence, and performance. To date, we are not aware of any published research that has assessed the mediational influence of sports confidence upon the sources of confidence-performance relationship. Current findings indicate that athletes who gain confidence based on their achievements (i.e., mastery and demonstration of ability) are more likely to perform better due to elevated levels of sport confidence. It has been allueded[5] that other-referenced sources of ability (i.e., demonstration of ability) can potentially undermine confidence and subsequence performance, whereby self-referenced sources of ability (i.e., mastery) are more like to enhance confidence and facilitate performance. The present findings indicate that athletes who draw upon both achievement-based sources of confidence, mastery (self-reference ability) and demonstration of ability (other-referenced ability), predicts higher state sports confidence resulting in enhanced performance. Accordingly, in order to facilitate sports confidence and subsequent performance,

practitioners may want to consider helping athletes construe their ability from both self and other referenced sources of confidence. Therefore, the effect of mastery and demonstration of ability could, potentially, be more beneficial when used in combination rather than isolation. Before this contention can be confirmed, research of an experimental nature is required.

Vealey and Chase[2] advocated the need to better understand the direct relationship between self-confidence and imagery use, due to the equivocal findings that have emerged from the sport psychology literature. The present study found imagery types to have a significant positive linear relationship with sport confidence. Specifically, MS, MG-A and MG-M predicted, linearly, state sport confidence. As such, this study supports previous research advocating confidence to be associated with the frequent use of multiple motivational imagery types[13,15,16,17]. Accordingly, sport psychologists may wish to devise interventions that combine the frequent use of different motivational imagery types in order to facilitate state confidence. It should be noted, however, that the SIQ was intended to measure frequency with which athletes use certain type of images. The actual perceived effectiveness of imagery type for enhanced confidence cannot be inferred from the SIQ. Therefore, from the current findings, it cannot be assumed that all types of motivational imagery were effective for improved sport confidence. Previous research has attempted to measure perceived imagery effectiveness[28]. However, Weinberg and colleagues[28] did not consider the type of perceived imagery effectiveness in relation to either imagery function or outcome. Therefore, it was difficult to know what exactly athletes perceived imagery to be effective for. Nordin and Cumming[29] did assess perceived imagery effectiveness against imagery function, but not imagery outcome. At this juncture it is important to distinguish that imagery function (i.e., reasoning for employing an image) and imagery outcome (i.e., result of the imagery process) are not one of the same, but rather distinctive constructs[10,14].

Therefore, future research is required examining not only frequency of imagery type, but also the perceived effectiveness in relation to facilitating imagery outcomes such as enhanced confidence. Furthermore, in view that imagery type[30] and confidence[31] can change over time, future investigations may wish to consider the temporal patterning of these constructs using longitudinal research designs.

Primarily research has found CS-imagery type to be most facilitative for enhanced performance[32], although some contradictory evidence exists[33]. As such, it has been asserted that the relationship between imagery type and related outcomes is not straightforward[14]. Upon extending previous findings, the current study found only MS imagery type had a significant direct relationship with performance. A limitation of previous research exploring imagery type-performance relationship is the lack of consideration given to mediating variables that may account for this relationship. Preliminary research has indicated self-efficacy to have no significant mediational influence upon imagery type-performance relationship[20]. In contrast, the current study found the broader conceptualization of sport confidence positively mediated the relationship between all imagery types and performance. Put differently, imagery type was found to have an indirect effect on performance, via the influence of sport confidence. This finding suggests that higher levels of sport confidence obtained from the frequent use of a variety of imagery types can lead to enhanced performance. Bandura[1] has argued that imaginal experience (or cognitive self-modeling), in the form of visualizing other people performing successfully, is an important source of specific self-efficacy judgments. Similarly, current findings suggested the frequent use of a variety of imagery types, both cognitive and motivational, might act as important sources of confidence that can enhance broader sport confidence beliefs and, in addition, lead to enhanced performance outcomes. Despite this finding, it is possible that some athletes will not reap the performance benefits of enhanced confidence as a result of frequent imagery

use, due to extraneous moderating factors. For example, these include imagery ability (e.g., ease/ difficulty) and imagery direction (e.g., facilitative/ debilitative). A recent study by Williams and Cumming[34] found lower trait sport confident athletes had lower perceptions of ability in using mastery and goal images compared to their higher trait sport confident counterparts. An experimental study by Short et al.[35] found athletes assigned to MG-M + facilitative group increased their level of confidence, whereas athletes in the MG-M + debilitative group exhibited lower confidence. It is possible, therefore, that imagery ability and imagery direction may change the nature of the imagery type – sport confidence – performance relationship. It is recommended that future research should employ structural equation modeling in order to account for the moderating influence of imagery ability and direction upon the abovementioned relationship.

This investigation is one of very few studies considering the role of sport confidence in relation to sources of sport confidence, imagery type and performance. However, there are study limitations to be considered. First, the cross-sectional design prevents this study from making conclusions based on causality. In order to make causal links, experimental research is required to ascertain whether improvements in sport confidence, as a result of frequent multiple imagery use and achievement- based confidence source, can subsequently lead to enhanced performance. Second, the sample size of the current study is modest. It must be noted, however, that state measures were obtained within one hour of competition, hence the difficulty for obtaining a large enough sample to satisfy statistical use. In spite of this, the relatively small retrospective time lag between measurement and recall meant the likelihood of acquiring data that contains reduced memory bias. Finally, single-item scales used to obtain levels of sport confidence and performance can potentially be marred by measurement error and reliability is unverifiable. Although, psychometric evidence has indicated that single-item scales do demonstrate high face and predictive validity[36].

Conclusions

The present study provides some support for Vealey's[3] theorizing, however, further research is required that builds on the preliminary findings found in this study. Practically, our findings indicate that athletes who use achievement-based sources of confidence are likely to benefit from performance increments due to having elevated state sport confidence beliefs. In addition, our findings extend Vealey's work by suggesting that imagery type may also be an important source of state confidence. For instance, our findings indicate that athletes' who image multiple cognitive and motivational images frequently are likely to benefit from enhanced levels of state sport confidence that can augment performance. To ensure this desired outcome, further research needs to consider the moderating influence that perceived imagery effectiveness, ability and direction may have upon the imagery type-sport confidence- performance relationship. Research of this nature would help maximize imagery interventions that aim to improve confidence and consequent performance.

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Table 1. Means, Standard Deviations, Normality Estimates, and Correlations for sources of sport confidence, confidence, and performance

Variable	Mean	SD	Skewness	Kurtosis	1	2	3	4	5	6	7	8	9	10
1. Mastery	5.12	1.18	-.64	.79	(.88)									
2. Demonstration of Ability	5.03	1.32	-.60	-.15	.43**	(.90)								
3. Physical and Mental Preparation	5.25	1.09	-.46	.26	.49**	.43**	(.86)							
4. Self-Presentation	4.87	1.54	-.67	.08	.19*	.29**	.31**	(.91)						
5. Social Support	5.08	1.09	-.46	.30	.50**	.32**	.49**	.30**	(.82)					
6. Coach Leadership	5.29	1.20	-.58	.32	.61**	.35**	.50**	.29**	.56**	(.73)				
7. Vicarious Experience	5.10	1.20	-.67	.37	.51**	.29**	.40**	.19*	.47**	.63**	(.89)			
8. Environmental Comfort	5.19	1.13	-.89	1.16	.46**	.31**	.45**	.42**	.44**	.54**	.45**	(.81)		
9. Situation Favorableness	4.85	1.13	-.07	-.51	.22**	.36**	.26**	.32**	.20*	.25**	.22**	.51**	(.66)	
10. Confidence	7.25	1.57	-.26	-.38	.27**	.30**	.21**	.14	.24**	.27**	.11	.12	.02	-
11. Performance	6.73	1.46	-.27	.00	34**	.26**	.23**	-.06	.22**	.18	.12	.10	.22**	.39**

**Statistically significant at $p < .01$; * $p < .05$.

Table 2. Means, Standard Deviations, Normality Estimates, and Correlations for imagery types, confidence, and performance

Variable	Mean	SD	skewness	kurtosis	1	2	3	4	5	6
1. CS	4.72	1.16	-.49	.05	(.85)					
2. CG	4.56	1.20	-.33	-.15	.82**	(.83)				
3. MS	4.53	1.30	-.23	-.26	.73**	.76**	(.84)			
4. MG-A	4.47	1.17	-.36	.07	.77**	.77*	.73**	(.81)		
5. MG-M	4.99	1.11	-.33	-.30	.72**	.80**	.74**	.64**	(.85)	
6. Confidence	7.25	1.57	-.26	-.38	.29**	.36**	.38**	.19*	.45**	-
7. Performance	6.73	1.46	-.27	.00	.10	.20*	.33**	.18*	.26**	.39**

**Statistically significant at $p < .01$; * $p < .05$.

Note. CS = Cognitive Specific; CG = Cognitive General; MS = Motivational Specific; MG-A = Motivational General Arousal; MG-M = Motivational General Mastery.

Table 3. Linear Regression Analysis using demographic variables, sources of sport confidence as predictors of confidence

Variable	**B**	***SE***	***β***	**ΔR^2**
Step 1				.07*
Gender	-.61	.29	-.17*	
Age	.04	.02	.16	
Skill Level	.19	.15	.10	
Step 2				.14**
Mastery	.16	.14	.12	
Demonstration of Ability	.26	.11	.22*	
Physical and Mental Preparation	.07	.15	.05	
Physical Self-Presentation	.19	.09	.02	
Social Support	.14	.14	.09	
Coach Leadership	.22	.15	.17	
Vicarious Experience	-.18	.13	-.14	
Environmental Comfort	-.10	.15	-.07	
Situation Favorableness	-.12	.13	-.09	

**Statistically significant at $p < .01$; * $p < .05$

Table 4. Direct, Indirect and Total Effects of Sources of Sport Confidence on Performance

Path	**Direct Effect Estimate**	**Indirect Effect Estimate**	**Total Effect Estimate**	**Kappa-squared [95% CI]**
Achievement → Performance	.17**	.08**	.24**	.105 [.033-.219]
Self-Regulation → Performance	-.00	.06	.05	.083 [.009-.188]
Social Climate → Performance	.06*	.03*	.08**	.077 [.017-.155]

**Statistically significant at $p < .01$; * $p < .05$

Table 5. Linear Regression Analysis using demographic variable and imagery as predictors of confidence

Variable	B	*SE*	β	ΔR^2
Step 1				.07*
Gender	-.61	.29	-.17*	
Age	.04	.02	.16	
Skill Level	.19	.15	.10	
Step 2				.21***
CS	-.00	.19	.00	
CG	.12	.21	.09	
MS	.31	.15	.25*	
MG-A	.42	.17	.31*	
MG-M	.50	.18	.35**	

***Statistically significant at $p < .001$; **$p < .01$; *$p < .05$

Note. CS = Cognitive Specific; CG = Cognitive General; MS = Motivational Specific; MG-A = Motivational General Arousal; MG-M = Motivational General Mastery.

Table 6. Direct, Indirect and Total Effects of Imagery Type on Performance

Path	Direct Effect Estimate	Indirect Effect Estimate	Total Effect Estimate	Kappa-squared [95% CI]
CS → Performance	-.02	.14**	.13	.116 [.050, .209]
CG → Performance	.09	.16**	.25*	.128 [.055, .219]
MS → Performance	.24**	.13**	.37**	.116 [.047, .215]
MG-A → Performance	.14	.09*	.22*	.071 [.017, .166]
MG-M → Performance	.13	.21**	.33**	.147 [.061, .252]

**Statistically significant at $p < .01$; * $p < .05$