

A Temporal Examination of Elite Performers Sources of Sport-Confidence

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This study examined temporal changes in sources of sport-confidence during the build up to an important competition. Elite individual athletes ($N = 54$) completed the Sources of Sport-Confidence Questionnaire (SSCQ) at five precompetition phases (6 weeks, 4 weeks, 3 weeks, 2 weeks and 1 week before competition). A two-factor (gender $\times$ time-to-competition) MANOVA revealed no significant interactions, but highlighted both time-to-competition and gender main effects. Time-to-competition main effects indicated the importance placed upon demonstration of ability, physical/mental preparation, physical self-presentation and situational favorableness sources of sport-confidence changed during the precompetition phase. Gender main effects revealed that female athletes demonstrated a significantly greater reliance on sources associated with mastery, physical self-presentation, social support, environmental comfort and coach's leadership than male athletes. These findings emphasize the benefit of considering sources of sport-confidence as competition approaches; they may have implications for the design and timing of confidence based interventions.

Self-confidence affects the way one feels, thinks and behaves, and thus has an important influence upon sporting performance (e.g., Bandura, 1997; Jones & Hanton, 2001; Vealey, 2001; Vealey, Hayashi, Garner-Holman, & Giacobbi, 1998). Consequently, the domain of self-confidence has received considerable research attention within sport psychology literature. Self-confidence has been conceptualized in several ways within the sport and exercise psychology literature; these include, movement confidence (Griffin & Keogh, 1982), performance expectancy (Corbin, Landers, Feltz, & Senior, 1983), perceived competence (Harter, 1978), self-efficacy (Bandura, 1986, 1997), and sport-confidence (Vealey, 1986; Vealey et al., 1998). Predominantly, Bandura's self-efficacy theory has been adopted to examine confidence in the sport psychology literature. According to Feltz and Chase (1998), Vealey's notion of sport-confidence shares similarities with Bandura's conceptualization of self-efficacy in that both are based on social cognitive theory. Consequently, both can be regarded as cognitive mechanisms through which individuals mediate their motivation and behavior within a goal context. In contrast to the specificity of self-efficacy, Vealey conceptualized sport-confidence

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as "...the belief or degree of certainty individuals possess about their ability to be successful in sport" (1986, p.222).

Initial studies examining Vealey's model of sport-confidence failed to provide support for the predictions contained within (e.g., Gayton & Nickless, 1987; Vealey, 1986). As a result, Vealey et al. (1998) updated the model in an attempt to address deficiencies in the initial approach. Specifically, sport-confidence was described multidimensionally (Vealey, 2001; Vealey et al., 1998), and they acknowledged the impact of sociocultural forces on the way sport-confidence is developed within athletes (e.g., Vealey, 2001; Vealey et al., 1998). Further, they addressed the initial model's failure to include the determinants, or rather the sources of sport-confidence (Vealey et al., 1998).

The creation of beliefs regarding self-efficacy relies on self-appraisal and evaluation with respect to a wide range of sources of information (Bandura, 1997). Although Bandura originally identified four principal sources of information that underpinned efficacy expectations, more recently this has been extended to six, namely; enactive mastery experiences, vicarious experience, imaginal experience, verbal persuasion, and perception of emotional and physiological states (Maddux, 1995; Maddux & Gosselin, 2003). Vealey et al. (1998) however, questioned whether these were the most salient sources available to athletes within the unique sporting environment. Specifically, they proposed that athletes rely on additional sources of confidence influenced by social, organizational and/or demographic factors. Consequently, Vealey et al. (1998) conducted a four phase study to identify the sources of sport-confidence most salient to athletes, and further to develop a valid and reliable measure of these sources. Their data on 500 high school and collegiate athletes elicited nine primary sources of sport-confidence, which could be assessed using the newly devised Sources of Sport-Confidence Questionnaire (SSCQ; Vealey et al., 1998). From a practical perspective, Vealey et al. suggested that the nine sources of sport-confidence fall within three broad domains; mastery and demonstration of ability are included within the *achievement* domain, physical/mental preparation and physical self-presentation fall within the *self-regulation* domain, and finally the sources of social support, vicarious experience, coach's leadership, environmental comfort, and situational favorableness are included in the *social climate* domain. Specifically, these broader domains were created to provide practitioners with a framework through which to design and implement confidence enhancing interventions (Vealey, 2001).

In addition to determining the salient sources, Vealey et al. (1998) identified which sources of sport-confidence were most important for performers. Findings revealed that both high school and collegiate athletes rated physical/mental preparation, social support, and mastery among their top five sources of sport-confidence. Further, they found that athlete characteristics (e.g., gender) and organizational factors affected the salience of the sources of sport-confidence to athletes (Vealey et al., 1998). In the third phase of their study, which incorporated individual sport athletes, social support and physical self-presentation were identified as more important sources of sport-confidence for females than males. Similarly, in the fourth and final phase, female team sport athletes perceived that social support was a more important source of sport-confidence than did male team sport athletes, whereas males indicated that demonstration of ability was a more important source. Finally,

collegiate athletes placed a greater emphasis on their physical self-presentation than the high school athletes in this sample.

Research has also illustrated that the sources of sport-confidence used by athletes are influenced by several other factors, including; injury (e.g., Magyar & Duda, 2000), goal orientations (Magyar & Feltz, 2003), and age (Wilson, Sullivan, Myers, & Feltz, 2004). More recently, Hays, Maynard, Thomas and Bawden (2007) suggested that the organizational culture of World Class sport was different from that examined within previous studies (e.g., intercollegiate athletics; Magyar & Duda, 2000), and that athletes in this context may derive confidence from alternative sources. Using a qualitative methodology with a sample of fourteen World Class athletes, Hays et al. identified nine sources of sport-confidence salient to these individuals; preparation, performance accomplishments, coaching, innate factors (e.g., athletes believed they possessed innate qualities that facilitated their success in sport), social support, experience, competitive advantage, self-awareness, and trust. In congruence with the findings of Vealey et al. (1998), Hays et al. noted several gender variations. Specifically, females primarily derived confidence from their coach's encouragement and positive feedback (comparable to Vealey et al.'s social support source), whereas males derived confidence from a belief that their coach would set an appropriate training program (akin to the coach's leadership source identified by Vealey et al.). This finding highlights commonalities between the sources identified in the two studies, others include; preparation and performance accomplishments (i.e., both sources associated with achievement). Collectively, it can be argued that Hay's et al., research substantiates the sport-confidence model's predictions that athlete characteristics, organizational and/or social factors influence the sources of sport-confidence.

Griffith (1925) proposed that research should be conducted using experienced and successful athletes in order that findings could be applied to less successful sport participants. At an elite level, Olympic athletes often report their confidence as unstable and fragile; this characteristic can then be shown to distinguish between successful and unsuccessful performance (Gould, Guinan, Greenleaf, Medbury, & Peterson, 1999). Although explanations for such fluctuations in self-confidence remain unclear, extending Vealey et al.'s (1998) study may help to provide some insight. Vealey et al. proposed that the stability of sport-confidence was a function of the sources upon which individuals' base their beliefs. Specifically, deriving confidence from controllable sources (e.g., mastery, physical/mental preparation) would facilitate stable sport-confidence beliefs. Conversely, obtaining confidence from uncontrollable sources (e.g., environmental comfort, physical self-presentation) would create less stable and weaker perceptions of sport-confidence. As a result, athletes (e.g., Olympians) may report fluctuating levels of confidence as a function of the sources they use to derive confidence. Consequently, from a practical perspective, examining the stability of the sources of sport-confidence would help provide practitioners with more knowledge upon which to design effective interventions aimed at developing robust and stable sport-confidence beliefs.

Temporal investigations into self-confidence have tended to examine "levels" over time, particularly in the build up to a specific competitive event (e.g., Jones, Swain, & Cale, 1991; Martens, Burton, Vealey, Bump, & Smith, 1990; Thomas, Maynard, & Hanton, 2004). One of the limitations of this work is that examining

self-confidence through a seven-day precompetition cycle only provides a limited snapshot of performers' confidence when performers often prepare long-term for important events (Cerin, Szabo, Hunt, & Williams, 2000; Mellalieu, Hanton, & Fletcher, 2006). Furthermore, the updated model of sport-confidence (Vealey et al., 1998) suggests that examining the sources of sport-confidence over time can lead to a better prediction of athletes' performance and the sport experience rather than solely measuring athletes' level of sport-confidence (Magyar & Duda, 2000). Indeed, by assessing from where athletes' derive their confidence, and how the importance of these sources changes over time, we can begin to develop a clearer understanding of how self-confidence per-se is affected. Consequently, the purpose of this current study was to examine temporal changes in elite performers' sources of sport-confidence in the build up to a major competition, and to identify any gender differences in the level of importance placed on these sources. Research into the temporal variations in sources of sport-confidence is in its infancy, consequently, no specific hypotheses were created.

Method

Participants

The participants ($N = 54$) consisted of male ($N = 29$) and female ($N = 25$) elite individual sport performers. The sports included; karate ($n = 8$), diving ($n = 7$), judo ($n = 7$), badminton ($n = 6$), table tennis ($n = 5$), cycling ($n = 4$), mountain running ($n = 3$), athletics ($n = 2$), ice skating ($n = 2$), motor racing ($n = 2$), pistol shooting ($n = 2$), trampolining ($n = 2$), triathlon ($n = 2$), artistic roller skating ($n = 1$), boxing ($n = 1$). All performers were currently competing at an international level. The age of the performers ranged from 18 to 51 ($M = 24.59$, $SD = 6.99$), and had an average of 11.25 ($SD = 6.53$) years competing in their sport. Following institutional ethics approval all participants provided voluntary informed written consent.

Instrumentation

Sources of Sport-Confidence Questionnaire (SSCQ). The SSCQ (Vealey et al., 1998) was used to assess participants' sources of sport-confidence. The inventory comprises 43 items across nine subscales: mastery (5 items), demonstration of ability (6 items), physical/mental preparation (6 items), physical self-presentation (3 items), social support (6 items), coach's leadership (5 items), vicarious experience (5 items), environmental comfort (4 items), and situational favorableness (3 items). For this study, the SSCQ instructions were modified to provide participants with a specific temporal frame of reference on which to base their responses. Specifically, participants were asked to indicate how important the source represented by each item was for them "right now" in relation to their upcoming major competition (e.g., Olympic trials, European cup) on a Likert scale ranging from 1 (*not at all important*) to 7 (*of highest importance*). Subscale scores were calculated as a mean score of all items on each individual subscale. Vealey et al. (1998) reported acceptable internal reliability scores (Cronbach alpha's) for the nine sources of sport-confidence of between 0.71 and 0.93.

Procedure

Following initial discussions with coaches and/or organizational representatives, potential athletes were approached before their normal training sessions. Participants were informed that the researcher was interested in understanding more about their confidence in the build up to an important competition, and then were given the opportunity to ask any questions concerning the research project. Participants completed the SSCQ on the same day at each precompetition phase, and away from the competition environment to avoid contextual influences (e.g., audience effects). It was emphasized that there were no right or wrong answers and athletes were encouraged to answer as honestly as possible when completing the questionnaire. Data were collected at five precompetition phases (6 weeks, 4 weeks, 3 weeks, 2 weeks and 1 week) in the build up to a major competition (e.g., Olympic trials). The modified guidelines of Vealey et al. (1998) were provided at the top of the SSCQ for each precompetition phase.

The sample could be viewed as a convenient sample of elite performers because the nature of the research design required participants to be working toward a “major” competition (e.g., Olympic trials). Consequently, although in excess of one hundred elite performers were approached, a significant number were unable to be involved because of the timing of their competitive season.

Data Analysis

Following Tabachnick and Fidell's (1996) recommended actions, data were diligently and comprehensively prescreened for internal reliability and statistical assumptions (i.e., multivariate normality, sphericity, homogeneity of variance-covariance, linearity, multicollinearity and singularity). Primary analysis involved a two-factor (gender x time-to-competition) multivariate analysis of variance (MANOVA) with repeated measures on the time-to-competition factor. MANOVA identified any gender x time-to-competition interactions and main effects for time and gender throughout the precompetition phases. Follow-up Bonferroni corrected pairwise comparison tests were employed to isolate mean differences. Using procedures outlined by Mullineaux, Bartlett and Bennett (2001), effect sizes (*d*) were calculated to give an indication of the magnitude of any differences obtained.

Results

Assumption Testing

Reliability scores for each time phase are presented in Table 1; all sources exceeded the .70 alpha criterion as advocated by Nunnally (1978). Following data screening, the assumptions of multivariate normality, homogeneity of variance-covariance, linearity, multicollinearity, and singularity were satisfied. It is important to note that equality of covariance matrices were acceptable at the univariate level (Levene's test and F_{MAX} ratios) but not satisfactory at the multivariate level. Subsequently, Pillai's trace was chosen as the multivariate test statistic as it has been found to maintain power at reasonable levels (Tabachnick & Fidell, 1996). Further, it provides a more robust test when possible violations of assumptions have occurred and thus

Table 1 Coefficient Alphas, Means and Standard Deviations for Sources of Sport-Confidence Across Each Time Phase

Source	6 weeks			4 weeks			3 weeks			2 weeks			1 week		
	α	<i>M</i>	<i>SD</i>	α	<i>M</i>	<i>SD</i>	α	<i>M</i>	<i>SD</i>	α	<i>M</i>	<i>SD</i>	α	<i>M</i>	<i>SD</i>
Mastery	0.89	5.05	1.01	0.89	5.14	0.98	0.89	5.14	0.96	0.87	5.12	0.97	0.89	5.16	1.08
Demonstration of Ability	0.92	5.70	0.98	0.94	5.86	1.01	0.94	5.92*	0.93	0.93	6.00*	0.89	0.90	6.02*	0.89
Physical/Mental Preparation	0.80	5.47	0.74	0.84	5.61	0.76	0.87	5.60	0.80	0.86	5.65	0.81	0.86	5.74**	0.78
Physical Self-Presentation	0.79	3.88	1.34	0.79	4.12	1.33	0.81	4.13	1.31	0.80	4.19	1.40	0.82	4.23*	1.41
Social Support	0.91	4.89	1.08	0.93	4.93	1.11	0.92	4.90	1.12	0.93	4.94	1.19	0.94	4.91	1.19
Coach's Leadership	0.96	4.44	1.53	0.97	4.41	1.64	0.98	4.31	1.68	0.97	4.33	1.73	0.98	4.35	1.71
Vicarious Experience	0.93	3.11	1.29	0.94	3.05	1.07	0.97	3.21	1.28	0.95	3.27	1.37	0.94	3.19	1.38
Environmental Comfort	0.82	4.01	1.35	0.88	4.10	1.50	0.88	4.17	1.45	0.88	4.19	1.47	0.86	4.16	1.46
Situational Favorableness	0.75	3.97	1.14	0.82	4.33*	1.30	0.77	4.37*	1.28	0.75	4.41*	1.29	0.81	4.42*	1.39

Note. * = Significant difference from 6 weeks $p < .05$; + = Significant difference from 3 weeks $p < .05$

reduces the potential for distortion of the alpha levels and therefore committing type I or type II errors.

Multivariate Analysis of Variance

Results from the two-factor (gender $\times$ time-to-competition) MANOVA failed to reveal any significant interactions, which suggests that there are similarities in the temporal patterning of sources of sport-confidence for males and females in the build up to competition. Multivariate time-to-competition and gender main effects were, however, identified. Violations to the assumption of sphericity for the repeated measures analyses on time-to-competition means resulted in the Greenhouse-Geisser correction factor being applied to the F statistic calculation (Tabachnick & Fidell, 1996).

Time-to-Competition Effects. MANOVA indicated a significant time-to-competition main effect (Pillai's trace = .840, $F(36, 17) = 2.48$, $p = .02$). Follow-up within-subject one-way ANOVAs showed that changes over time occurred for demonstration of ability $F(2.74, 142.62) = 7.57$, $p = .001$, $d = .34$; physical/mental preparation $F(2.45, 127.40) = 4.24$, $p = .01$, $d = .35$; physical self-presentation $F(2.72, 141.27) = 4.73$, $p = .005$, $d = .26$; and situational favorableness $F(2.50, 130.22) = 7.46$, $p = .001$, $d = .35$. Bonferroni corrected pairwise comparisons revealed that demonstration of ability was significantly more important at 3, 2 and 1 week before competition compared with 6 weeks. Physical/mental preparation was significantly more important at 1 week before competition than 6 weeks prior and also at 1 week before competition compared with 3 weeks before. Physical self-presentation was significantly more important at 1 week until competition than at 6 weeks. Finally, situational favorableness was significantly more important at 4, 3, 2 and 1 week before competition compared with 6 weeks. Overall, these results show an increased importance of these specific sources as competition approaches (see Figure 1).

Gender Effects. The two-factor MANOVA revealed a main effect for gender (Pillai's trace = .365, $F(9, 44) = 2.81$, $p = .01$). Follow-up between-group univariate ANOVAs indicated differences between males and females for mastery $F(1, 52) = 6.74$, $p = .01$, $d = .68$; physical self-presentation $F(1, 52) = 6.46$, $p = .01$, $d = .67$; social support $F(1, 52) = 7.58$, $p = .01$, $d = .74$; environmental comfort $F(1, 52) = 12.73$, $p = .001$, $d = .98$; and coach's leadership $F(1, 52) = 5.90$, $p = .02$, $d = .64$. Bonferroni corrected pairwise comparisons revealed that females perceived mastery, physical self-presentation, social support, environmental comfort and coach's leadership as more important sources of sport-confidence than males throughout the precompetition period (see Table 2).

Descriptive Statistics for Rankings of Importance for the Sources of Sport-Confidence

Table 3 displays the sources of sport-confidence across each time period ranked (according to their mean scores) in order of importance. Demonstration of ability, physical/mental preparation, mastery, and social support sources of sport-confidence were consistently the top to the fourth-ranked most important sources respectively

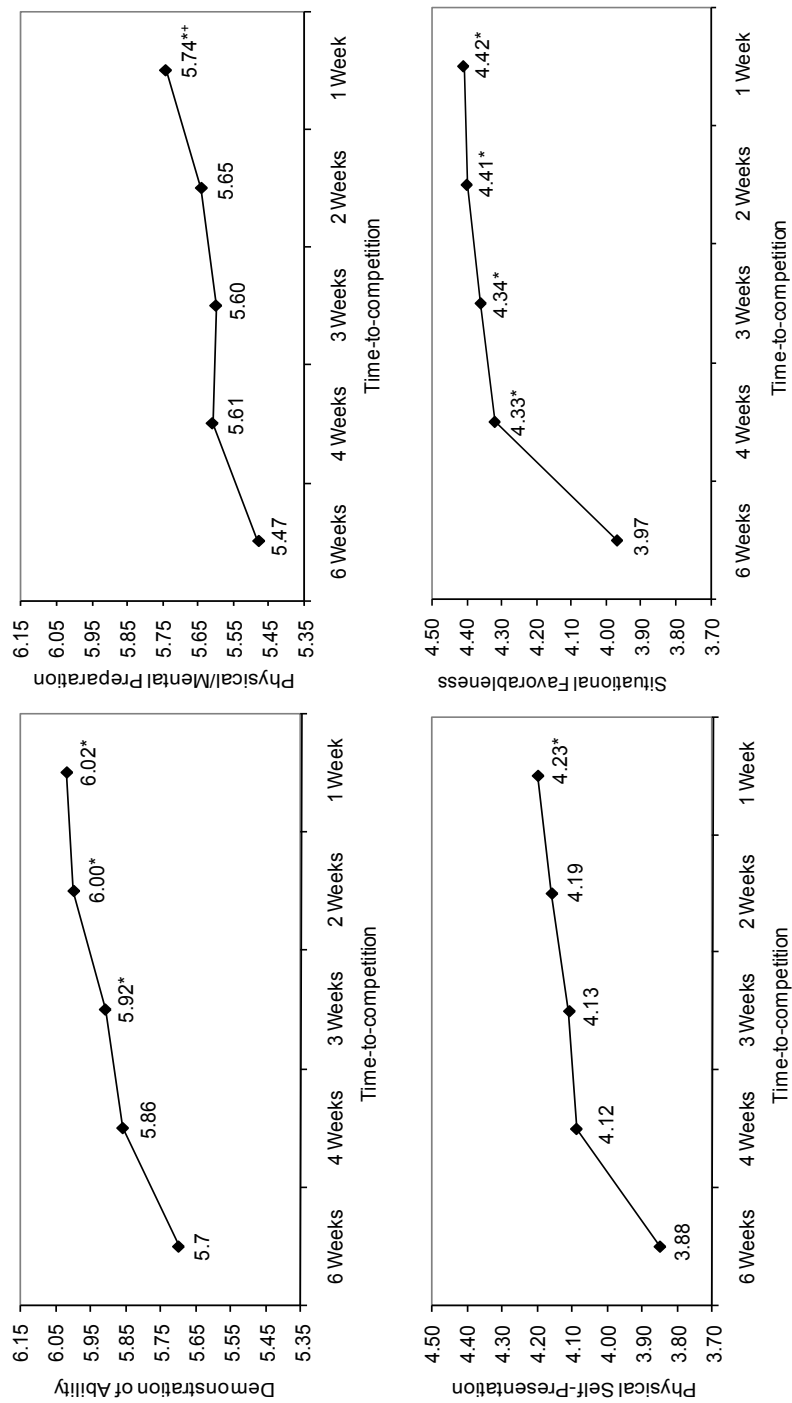


Figure 1 — Significant main effects for time-to-competition changes across the sources of sport-confidence. Note. * = Significant difference from 6 weeks $p < .05$ + = Significant difference from 3 weeks $p < .05$.

Table 2 Overall Means and Standard Deviations for the Sources of Sport-Confidence Across Time for Gender

Source	Male			Female		
	α	<i>M</i>	<i>SD</i>	α	<i>M</i>	<i>SD</i>
Mastery	0.90	4.83	1.13	0.88	5.46*	0.73
Demonstration of Ability	0.92	5.94	0.94	0.92	5.86	0.95
Physical/Mental Preparation	0.81	5.48	0.79	0.80	5.77	0.75
Physical Self-Presentation	0.80	3.71	1.33	0.77	4.57*	1.27
Social Support	0.90	4.55	1.21	0.87	5.33*	0.89
Coach's Leadership	0.96	3.89	1.62	0.94	4.91*	1.55
Vicarious Experience	0.94	3.19	1.37	0.91	3.13	1.28
Environmental Comfort	0.83	3.55	1.53	0.81	4.79*	0.98
Situational Favorableness	0.75	4.08	1.26	0.75	4.56	1.28

Note. * = Significant difference; $p < .05$

(i.e., across all time periods). Vicarious experience, conversely, was consistently ranked as the least important source of sport-confidence. Coach's Leadership was ranked as the fifth most important source at 6 weeks and 4 weeks before competition, and the sixth most important at 3 weeks, 2 weeks and 1 week before competition. Environmental comfort, was ranked as the sixth most important source of confidence 6 weeks before the competition, but its importance diminished (to the seventh or eighth most important) as competition approached. Situation favorableness became increasingly important as competition approached, having been ranked at the seventh and sixth most important source at 6 week and 4 weeks before competition respectively, it became the fifth most important for the remaining weeks before competition. Physical self-presentation was only ever the seventh or eighth most important source of sport-confidence in our sample of elite athletes.

Discussion

This study primarily examined the temporal patterning of elite individual performers' sources of sport-confidence in the time leading up to an important competitive event; secondly, we examined the effect of gender upon these sources. Although no interaction effects were obtained, (suggesting that the temporal patterning of sources of sport-confidence does not differ between elite male and female athletes in the competition preparation phases) there were, however, significant main effects for time-to-competition and gender.

In our sample of elite individual performers, the degree to which they used sources of sport-confidence associated with demonstration of ability, physical/mental preparation, physical self-presentation and situational favorableness, changed significantly as competition approached. The extent to which athlete's used demonstration of ability as a source was greater at three weeks, two weeks and at one week until competition compared with six weeks. Furthermore, although

Table 3 Ranking of Importance of Sources of Sport-Confidence Across Time

Ranking	6 week	4 weeks	3 weeks	2 weeks	1 week
	Source (M)	Source (M)	Source (M)	Source (M)	Source (M)
1	DoA (5.70)	DoA (5.86)	DoA (5.92)	DoA (6.00)	DoA (6.02)
2	P/MP (5.47)	P/MP (5.61)	P/MP (5.60)	P/MP (5.65)	P/MP (5.74)
3	Mast (5.05)	Mast (5.14)	Mast (5.14)	Mast (5.12)	Mast (5.16)
4	SS (4.89)	SS (4.93)	SS (4.90)	SS (4.94)	SS (4.91)
5	CL (4.44)	CL (4.41)	SF (4.34)	SF (4.41)	SF (4.42)
6	EC (4.01)	SF (4.33)	CL (4.31)	CL (4.33)	CL (4.35)
7	SF (3.97)	PSP (4.12)	EC (4.17)	EC (4.19) / PSP (4.19)	PSP (4.23)
8	PSP (3.88)	EC (4.10)	PSP (4.13)		EC (4.16)
9	VE (3.11)	VE (3.05)	VE (3.21)	VE (3.37)	VE (3.19)

Note. DoA = Demonstration of Ability; P/MP = Physical/Mental Preparation; Mast = Mastery; SS = Social Support; CL = Coach's Leadership; EC = Environmental Comfort; SF = Situational Favorableness; PSP = Physical Self-Presentation; VE = Vicarious Experience.

the levels may have changed, demonstration of ability was consistently ranked as the most important source of sport-confidence during the time leading up to competition (between 5.70 and 6.02 on the 7 point Likert-like scale). Vealey et al. (1998) suggested that demonstration of ability was based upon uncontrollable factors, and therefore deriving confidence in this manner can lead athletes to develop unstable and fluctuating confidence (Vealey et al., 1998). Thus, the finding that these elite athletes placed a greater emphasis on this source of sport-confidence closer to competition, and that demonstration of ability was ranked as the most important source of sport-confidence at all time periods, may help to explain why elite athletes sometimes describe fleeting confidence at important competitions (Gould et al., 1999).

Consistently ranked as the second most important source of sport-confidence based on the mean response scores, athletes placed a significantly greater reliance upon physical/mental preparation at one week before competition compared with six weeks and three weeks before competition. Hays et al. (2007) described a strong predictive relationship between evidence based perceptions of quality training (e.g., through training diaries) and enhanced feelings of confidence. Given the findings of this study, together with the suggestion of Vealey et al. (1998) that deriving confidence from controllable sources (e.g., physical/mental preparation) will produce stable levels of sport-confidence, it might be suggested that utilizing this source as competition approaches could help bolster an athlete's confidence. Further, as competition approaches, it is logical to assume that athlete's have completed more competition-specific training. Since this type of training provides tangible evidence of ability with regards to the task, it is not surprising that the extent to which athlete's use this source increases as a competition approaches.

The precompetition temporal patterning of physical self-presentation showed that elite athletes used this source of sport-confidence to a greater degree at one week before a major competition compared with six weeks prior. This finding may be explained by the fact that, with training, physical conditioning normally improves, and thus athletes may perceive that they look better than others as competition approaches. While it is necessary to highlight this significant finding, its overall importance in terms of its impact upon a performers' confidence might be relatively small. Physical self-presentation was consistently one of the lowest ranked sources in terms of importance. Interestingly, this might actually be adaptive from a confidence maintaining perspective, since an increased focus on perceptions of body type and looking good have been identified as a source of stress (Hanton, Fletcher, & Coughlan, 2005).

Finally, in terms of time-to-competition main effects, situational favorableness was less salient at six weeks in comparison with the four other time periods. However, examination of the mean-based rankings of importance suggest that, while it's importance increased as competition approached, relative to the other sources, athletes placed only a moderate level of importance upon this source (fifth most important at best). Situational favorableness concerns positive perceptions that the breaks of the situation are in one's favor. Therefore, if the situation is viewed as supportive of performance (and stable), placing a greater emphasis on this source as competition approaches could be expected to enhance one's confidence (Richardson, Adler, & Hanks, 1988). Conversely, Vealey et al. (1998) suggest that, deriving confidence from uncontrollable sources such as the environment causes athletes to

develop lower levels of sport-confidence. Therefore, placing a greater emphasis on this source of sport-confidence closer to competition has the potential to actually undermine athletes' confidence if the situation is perceived as unfavorable.

Sources of sport-confidence associated with mastery, social support, vicarious experience, coach's leadership, and environmental comfort were found to remain stable across each precompetition phase. When considering its consistently high ranking in terms of importance relative to other sources of sport-confidence (only demonstration of ability and physical/mental preparation were ranked as more important), the stability of the mastery-based source of sport-confidence has important implications for interventions designed to facilitate robust sport-confidence beliefs. Vealey et al. (1998) suggested that deriving confidence from mastery-based sources would produce stable beliefs; this is consistent with Bandura's (1997) self-efficacy theory. Specifically, according to Bandura, enactive mastery experiences gleaned from tasks which require individuals to overcome barriers and persist in the face of challenging situations, are proposed to lead to robust efficacy beliefs (Bandura, 1997). It could be argued therefore that deriving confidence from this source (when built upon this type of success), is important in forming stable and enduring confidence beliefs (Vealey et al., 1998).

The social support based source of sport-confidence was also stable in the lead up to competition; and this source of sport-confidence was consistently ranked as the fourth most important relative to the other sources. While this finding is consistent with previous research which has also identified social support as an important source of sport-confidence (e.g., Hays et al., 2007; Vealey et al., 1998), the rankings suggest that social support is not deemed as important as other more achievement-based sources of sport-confidence (e.g., mastery). Of the other three sources of sport-confidence that remained stable in the lead up to an important competition for our sample of elite athletes, coach's leadership was ranked either the fifth or sixth most important source in the precompetition phases. Environmental comfort was of lesser importance (between sixth and eighth ranked in terms of importance relative to the other sources), while vicarious experience was the least important across each time phase. This latter finding may be due to the fact that elite athletes are arguably toward the top end of ability within their sport and are therefore unlikely to place a large amount of importance upon deriving confidence from watching other athletes or squad members perform (Hays et al., 2007).

In examining gender effects, there were differences between male and female athletes in the importance placed upon five of the nine specific sources of sport-confidence (mastery, social support, coach's leadership, physical self-presentation, and environmental comfort). Firstly, females placed more importance on mastery as a source of sport-confidence than males. This result is congruent with research indicating that females place a greater emphasis on performing well and identifying good personal performances as a source of confidence compared with males (e.g., Hays et al., 2007; Jones et al., 1991; Vealey et al., 1998). Consistent with the findings of Vealey et al.'s (1998) study, elite female athletes relied more upon the social support source of sport-confidence than the male athletes. Gender differences have been observed within the social support literature, for example, females reportedly receive more emotional support than males (Rock & Jones, 2002), and perceive that a greater amount of emotional support is available to them (e.g., Hardy, Richman, & Rosenfeld, 1991). Hays et al. (2007) found that male and female world class

athletes both reported social support as an important source of sport-confidence, yet, their interpretation of this source differed. Specifically, females related social support to their coach whereas males related social support to their family, partners and/or friends. Thus, for female elite athletes, social support may be sourced to a greater degree from individuals around the sport environment (e.g., coaches) than for elite male athletes; this might also explain why females perceived coach's leadership to be more important than males.

Although ranked as only the seventh most important source for both males and females, the results for physical self-presentation indicated that females placed a greater importance on this source of sport-confidence than males. This parallels the results from the third-phase of Vealey et al.'s (1998) study (on the development of the SSCQ) which used individual sport athletes. Vealey et al., however, found that incorporating team sport athletes eliminated these gender differences. It was suggested that the variation in results may have occurred due to the two different types of sport being used within the two phases (Vealey et al., 1998). Organizational factors (e.g., variations between elite and nonelite; individual and team sport participation) and athlete characteristics (e.g., gender) were included within Vealey's updated model of sport-confidence to demonstrate the influence that social and cultural factors have upon the sources of sport-confidence (Vealey, 2001; Vealey et al., 1998). These factors may also help to explain the different results identified between the current study and that of Vealey et al.'s, such as those observed for environmental comfort, coach's leadership and physical self-presentation. The current investigation incorporated elite athletes whereas Vealey et al. used high school and college athletes. Research has shown that elite athletes are subjected to organizational stressors that nonelite athletes do not face (Fletcher, Hanton, & Mellalieu, 2006). Furthermore, Hays et al. (2007) demonstrated that elite male and female athletes differ in their interpretation of sources of sport-confidence. It is possible therefore, that certain gender differences may be present with an elite athlete sample which are not present at the subelite level.

Taken collectively, the elite females in this study used sources of sport-confidence associated with; mastering personal skills, reinforcement from significant others, perceptions of their body image, coach's leadership, and feeling comfortable in the competition environment to a greater degree than the male athletes. According to Vealey et al. (1998) the stability of sport-confidence is a function of the sources upon which individuals' base their belief. Specifically, deriving confidence from controllable sources (e.g., mastery) produces stable and enduring confidence beliefs whereas gaining confidence from uncontrollable sources of sport-confidence (e.g., environmental comfort and physical self-presentation) leads athletes to develop less stable and weaker perceptions of control and competence (Vealey et al., 1998). Previous research has shown that females report a decline in confidence as competition approaches whereas males indicate relatively stable levels of confidence (e.g., Jones et al., 1991). Therefore, it might be argued that females report a decrease in confidence because of a greater utilization of uncontrollable sources of sport-confidence. Interestingly in this study, elite female athletes were found to use mastery sources of sport-confidence more than males, yet relative to the other sources, both males and females appear to view it with equal (and high) importance. Previous research has found mastery experiences to be the most powerful source of confidence producing stronger and more generalized confidence beliefs (e.g.,

Bandura, 1997). It would be interesting therefore to establish whether the greater reliance upon mastery could have the potential to buffer against the instability of confidence argued to be associated with utilizing less controllable sources.

Practical Implications

According to Vealey et al. (1998), it is practical to consider the nine sources of sport-confidence as falling within three broad domains. Our results indicate that sources within the same domains do not follow the same temporal patterning. Specifically, within the achievement domain, the levels of importance placed upon demonstration of ability increased whereas mastery remained stable (they were both consistently ranked as more important sources of sport-confidence compared with others, which may be of more significance). Furthermore, situational favorableness was the only source of sport-confidence within the social climate domain to fluctuate during the precompetition time period. In contrast, both sources within the self-regulation domain followed the same temporal pattern in the time leading up to competition. Taken together these results suggest that although the three domains are a useful way to classify the sources, the applied practitioner developing interventions to enhance sport-confidence should target the individual sources upon which athletes place greater importance as competition approaches, rather than focusing on the broad domain into which the sources fall.

The temporal fluctuations in importance placed on various sources, and the relative value of that source compared with the others, suggest that coaches should attempt to create an environment where individual athletes have the opportunity to demonstrate competence within their training environment. This suggestion does not mean that direct competition should be emphasized, but rather positive behaviors in training should be endorsed, and positive feedback provided, to increase perceptions of demonstrating high levels of ability. In addition, demonstration of ability is concerned with one's perception that individuals are superior to their opponents; therefore, this source of sport-confidence may also be enhanced through performance analysis (i.e., emphasizing tactical/performance strengths over opponents). However, comparison with others can undermine an athlete's belief if it indicates inferior ability, and thus deriving confidence from uncontrollable sources such as demonstration of ability may actually undermine the stability of confidence beliefs (Vealey, 2001; Vealey et al., 1998). At a more practical level, techniques that provide athletes with evidence and visual accounts of their training progress (e.g., training diaries and performance profiling) should be encouraged to facilitate feelings of high levels of physical and mental preparation as competition approaches.

Gender differences in sources of sport-confidence have important implications for practitioners. Elite female athletes placed greater importance upon mastery, social support, physical self-presentation, environmental comfort and coach's leadership compared with males. Although these results may be expected, applied practitioners and coaches should continue to facilitate confidence in elite female athletes by structuring environments which provide opportunities for the mastery of new skills and techniques. For example, imagery could be used to convey feelings of success (Moritz, Hall, Martin, & Vadocz, 1996). High sport-confident athletes have been shown to use more mastery imagery and arousal imagery than low sport-confident athletes (Moritz et al., 1996). Thus, elite female athletes may

benefit more so than males from interventions incorporating mastery imagery during the build up to a major competition. Furthermore, the gender differences and increased importance placed upon coach's leadership and environmental comfort suggest that females rely more upon sources which contribute to a positive and achievement-nurturing climate than elite male athletes. Consequently, coaches and support staff should provide elite female athletes with encouragement to facilitate perceptions of social support and create environments in which female athletes feel challenged yet supported.

Finally, in addition to temporal fluctuations and gender differences in the utilization of the sources, at a general level, practitioners should also consider the relative importance placed on the sources when planning interventions. Certainly, sources associated with the achievement domain (mastery and demonstration of ability), physical/mental preparation, and social support may need to be targeted relative to the other sources because of the value placed upon them by athletes.

Limitations and Future Directions

Although the current study attempted to bridge a gap in the current knowledge base, there are several limitations which warrant attention. In terms of the sample, only individual sport athletes were considered and as such current findings may not apply to team sports. Furthermore, as highlighted by previous research (e.g., Hays et al., 2007; Vealey et al., 1998; Wilson et al., 2004) sources of sport-confidence are influenced by organizational and sociocultural factors, and therefore when generalizing to other athletic populations, these factors may need to be considered.

One potential limitation with this study relates to the lack of assessment of levels of self-confidence *per-se*. It could be argued that a stronger design would have been to concurrently examine the predictive effects on levels of confidence caused by the changing importance placed on the various sources as the major competition approached. From an applied perspective, the focus exclusively on sources rather than levels was, however, logical because our intention was to help guide practitioners to the types of information that they may need to focus upon as important competitions approach, and how these may change rather than their relative merits in terms of predicting confidence in their sport.

In outlining the theoretical and applied implications of our findings, a number of potential future research directions warrant attention. The purpose of this study was to explore the sources of sport-confidence during a six week build up to a major competition. Recently, Lidor, Blumstein and Tenenbaum (2007) suggested that sport psychology training should be incorporated into all periods of an athletes' training year. Furthermore, Mellalieu et al. (2006) suggested that interventions need to be designed from both a macro and micro level perspective. However, research has predominantly examined psychological constructs, including confidence, within the seven day precompetition period (e.g., Thomas et al., 2004). As such, the information gleaned from these studies is only appropriate for interventions based at a micro level. Consequently, from a macro level perspective, this study is important as the results have begun to create a picture of where elite athletes derive their confidence from in the build up to a major competition, and their relative importance. However, this picture is not complete; throughout an athletes' life their abilities will be repeatedly tested prompting periodic reappraisals of their confi-

dence beliefs (Bandura, 1997). Thus, researchers should examine sport-confidence from a broader macro perspective (e.g., competitive season or career) to build a comprehensive understanding of elite athletes' sport-confidence beliefs. Within the anxiety literature, Hanton and Jones (1999) adopted interviews and inductive analytical procedures to identify how swimmers developed effective pre-race stress management techniques throughout their careers. Researchers interested in understanding how performers can maintain and develop robust sport-confidence beliefs may look to adopt a similar approach. This suggestion is not meant to stimulate debate on whether research should investigate sport-confidence from either a micro or macro level perspective, but rather encourage researchers to explore confidence before, during and after events.

The time-to-competition effects indicated that the sources of sport-confidence encapsulated within each of the three broad domains outlined by Vealey et al. (1998) do not fluctuate in importance in similar ways. Consequently, although these broad domains may be intuitively useful, for example, when conversing with athletes or when designing general interventions, our findings suggest that Vealey et al.'s classifications may not be particularly useful in predicting patterns of change. Indeed, alternative ways to delineate the nine-sources may be equally appropriate, such as; personal and social sources, or internal and external sources for example. Researchers might thus consider attempting to provide a more appropriate classification which possesses greater predictive validity.

In considering the significant time-to-competition main effects for demonstration of ability, we encourage future researchers to consider the criteria by which one interprets ability. Research has shown that the manner through which one construes ability influences confidence (e.g., Bandura, 1997; Nicholls, 1989) and in particular the sources of sport-confidence (Magyar & Duda, 2000; Magyar & Feltz, 2003). From the perspective of achievement goal theory there are two ways to construe ability (Nicholls, 1989). The first conception of ability is self-referenced and related to the learning and mastery of a task. A person adopting this judgment of ability is described as possessing a task orientation. Ability can also be conceived through favorable comparison with others (i.e., other-referenced). An individual adopting this conception of ability would be described as possessing an ego orientation (Nicholls, 1989). It is suggested that athletes can be high (or low) in both orientations while possessing a dominant orientation (Nicholls, 1989). Generally, research supports the association of task orientation with increased motivation, greater persistence and positive affective and behavioral patterns more so than ego orientation (Whitehead, Andree, & Lee, 2004). While the quantitative approach adopted within this study precludes an inference of how elite athletes construe ability, it does illustrate that demonstration of ability was a more salient source as the major competition approached, and was consistently ranked as the most important source relative to others. Consequently, individual criteria for what represents 'ability' and how that fluctuates may need to be given careful consideration in promoting a focus on this source.

Although this study examined sources of sport-confidence within individual sport performers, previous research has shown that the importance placed upon specific sources varies depending on individual or team sport participation (e.g., Hays et al., 2007; Vealey et al., 1998). Sport-confidence was based on self-efficacy theory and developed to reflect an individuals' belief in their capabilities, however,

the complex psychology of team dynamics has been shown to influence one's belief (Carron, Colman, Wheeler, & Stevens, 2002). Within self-efficacy theory, Bandura (1997) separated personal efficacy beliefs from those of the combined team (terming this collective efficacy). Specifically, collective efficacy refers to a groups' shared belief in its combined abilities to perform the actions required to produce specific levels of performance (Bandura, 1997). Although different in terms of their unit of agency, personal efficacy and collective efficacy are suggested to share similar sources (Bandura, 1997). Therefore, while the sources within the SSCQ (Vealey et al., 1998) are pertinent, the dynamics of team situations might mean that subtle events (e.g., team interactions before competition) may elevate the relevance of certain sources. Consequently, future research should explore sources of sport-confidence within team sport performers, possibly through the use of qualitative methodologies. Similarly, it might also be argued that different sports have unique sociocultural characteristics, and that these may influence the importance placed on certain sources; this suggests that sport-specific research may be required.

In contrast to the findings of Vealey et al. (1998), the results of this study showed that physical self-presentation, environmental comfort and coach's leadership were more salient sources of sport-confidence for female athletes than male athletes. However, the present investigation examined elite athletes' sources of sport-confidence whereas Vealey et al. used high school and collegiate athletes. Subsequently, further research is required to establish whether these gender differences maybe a function of skill level, gender per-se or an interaction of the two.

As alluded to previously, the greater reliance placed upon uncontrollable sources of sport-confidence by female athletes may make them more susceptible to confidence being undermined than males (Vealey et al., 1998). Our results suggest, however, that females placed a greater importance upon mastery source of sport-confidence than males. Mastery experiences are suggested to be the most powerful source of confidence yielding stronger and more generalized confidence beliefs (e.g., Bandura, 1997). Subsequently, it would be interesting to examine whether controllable sources of sport-confidence, particularly those focused around mastery, have the potential to buffer against confidence debilitating factors. Finally, the current study included athletes ranging from 18 to 51 years, and from a wide variety of sports. Given that organizations, social and/or demographic factors have been found to influence the salience of sources of sport-confidence (e.g., Vealey et al., 1998), future research might examine sources of sport-confidence as a function of age or experience and sport culture.

Concluding Remarks

In summary, this study highlighted the importance of examining elite athletes' sources of sport-confidence during the build up to a major competition. Results illustrated that demonstration of ability, physical/mental preparation, physical self-presentation and situational favorableness sources of sport-confidence fluctuated during the precompetition period for elite athletes. In contrast, mastery, social support, vicarious experience, coach's leadership and environmental comfort based sources of sport-confidence remained stable in the time leading up to competition. Furthermore, consistently, demonstration of ability, mastery, physical/mental preparation and social support based sources were ranked as most important relative to

the other sources assessed using the SSCQ. Males and females did not differ in their time-to-competition patterns however, there were differences in the importance placed on certain sources of sport-confidence. Specifically, results suggested that females more so than males, would benefit from an environment which gives more opportunities to master skills, provides social support, and which remains challenging. However, the research design, nor the data produced, can provide any inference for why these temporal patterns or gender differences occurred. Therefore, future research should adopt qualitative approaches to examine the underlying perceived mechanisms for these observed temporal patterns and gender findings in greater depth. Overall then, this study has important implications for the design and timing (macro vs. micro) of confidence based interventions during the build up to a major competition.

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