Relations Between Elite Athlete Self-Concept And International Swimming Performance

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A swimming specific adaptation of the Elite Athlete Self Description Questionnaire (EASDQ) instrument was designed to measure six physical self-concept factors: Skills; Body; Physiological Competence (aerobic); Physiological Competence (anaerobic); Mental Competence; and Overall Performance. The adapted questionnaire will be referred to as the Elite Swimmers Self Description Questionnaire (ESSDQ). In collaboration with the Australian Institute of Sport and Australian Swimming, Incorporated we measured Elite Athlete self-concepts of all participants in the Pan Pacific swimming championships and the World Short Course Championships in Greece. Top swimmers (n=275) from 30 countries completed ESSDQ on the first day for each of their events. Also available for all participants were world rankings, personal bests and country rankings. Confirmatory factor analyses indicated good support for the invariance of ESSDQ a priori factor structure across country and events. Results show that: ESSDQ responses are positively related to individual world rank and personal best swimming achievements; Consistent with the big-fish-little-pond effect, country ranking had a negative effect on ESSDQ responses; Consistent with “reflected glory effects” pride with national team had positive effects on ESSDQ; and ESSDQ contributed to performance beyond world rank and personal best. Extending the generalisability of results based primarily on educational psychology, prior self-concept had a significant effect on actual performance at the championship beyond the effects of prior personal bests.

The elite swimmer is expected to perform at a level commensurate to their status of “elite”. As their swimming times decrease and performances improve the athlete often accepts accompanying pressure that may coincide with these improvements. A moderating variable in the perception of this pressure is one’s self-concept. The work of Shavelson and Marsh in particular has demonstrated the link between self-concept and performance in a sporting as well as academic setting. Coaches and school administrators alike have struggled to explain poor performance in their charges, when many objective and subjective signs indicate a higher level potential. In the sporting example one possible explanation is that the athletes’s opinion of themselves, influenced by internal and external comparative influences, may hinder their ability to perform up to their physical, mental and technical potential. One possible cause of this negative perception of self-concept is frame of reference effects. An internal and or external comparative evaluation may lead individuals to an overly critical and often detrimental self appraisal. The BFLPE and Internal/External models are well-established in the academic setting and appear to have a strong influence over sporting self perceptions, although these models have not been empirically well tested in that population.

Causal Ordering/Mediated Effects.

A critical question in academic self-concept research with important theoretical and practical implications is: Do changes in academic self-concept lead to changes in subsequent academic achievement? In research that broke new ground, Marsh (Marsh, 1990a, 1993a;
Marsh, Byrne & Yeung, 1999) demonstrated that prior self-concept leads to improvements in subsequent academic achievement beyond what can be explained in terms of prior achievement and academic ability. Hence, self-concept is both an important outcome variable and also plays a central role in mediating the effects of other desirable outcomes. Important methodological lessons from this research are also relevant to applications of self-concept to other disciplines (self-concepts of elite swimmers contributes to gold medal performances beyond what can be explained by previous personal bests) that are the focus of the present investigation.

The Influence of Frame of Reference Effects

People evaluate their accomplishments usually in relation to some standard or frame of reference. Even if athletes achieve similar accomplishments, their sporting self-concept will differ if they have different frames of reference. Below are descriptions of theoretical models and empirical support for two different frame of reference effects. In the internal/external frame of reference (I/E) model, Marsh (1986) and others, extended psychophysical and social contextual research to incorporate individuals’ comparisons of their own ability levels in different domains. In the Big-Fish-Little-Pond-Effect (BFLPE), Marsh (1987b) proposed that self-concept is influenced substantially by the ability levels of others in the immediate context in addition to one’s own ability level.

The Big-Fish-Little-Pond-Effect (BFLPE)

Marsh (1984a, 1984b; Marsh & Parker, 1984) proposed a frame of reference model called the Big-Fish-Little-Pond-Effect (BFLPE) to encapsulate external frame of reference effects. In this model, Marsh hypothesized that individuals compare their abilities with the abilities of their peers and use this social comparison impression as one basis for forming their own self-concept. The BFLPE occurs when equally able individuals have lower self-concepts when they compare themselves to more able individuals, and higher self-concepts when they compare themselves with less able individuals. For example, if an average ability athlete is a member of highly talented team, his sporting abilities would be lower than the average of the other athletes on that team, and this discrepancy will lead to sporting self-concepts that are below average. Conversely, if the athlete was a member of a lowly talented team, then his abilities would be above the average of the other athletes on the team, and that difference will lead to sporting self-concepts that are above average. Similarly, the sporting self-concepts of below average and above average athletes will depend on their sporting ability, but also will vary with type of team or league in which they compete. According to the BFLPE model, sporting self-concept will be correlated positively with individual achievement (better athletes will have a higher sporting self-concept), but negatively related to team average achievement (the same athlete will have lower sporting self-concept on a team where the average ability is high).

The BFLPE may also have an impact on athletes that are selected for elite teams, camps, or residential training programs. Consider a capable athlete who as been evaluated as the top athlete throughout his early sporting career in his hometown or state. This athlete has now been identified as “talented” and brought into an elite nationwide program where he may be average or at a level below that of his teammates. This may have a detrimental effect on the athlete’s sporting self-concept because he is no longer a big fish in a small pond (top of the state) but is in a large pond, full of even larger fish. The BFLPE is likely to be larger in highly competitive settings that use assessments that encourage athletes to compare their performance with other athletes. Research by Marsh and Peart (1988) suggested that BFLPE might be reduced if the emphasis and feedback is focused on cooperation as opposed to
competition. Individual improvement becomes the measure of success with an emphasis on intra-competition (within each athlete) and less on inter-competition (between athletes).

**The Juxtaposition of BFLPE Contrast and Assimilation (Reflected Glory) Effects**

The discussion regarding frame of reference effects cannot end here, because it appears that individuals may mediate the BFLPE through an assimilation effect, namely “reflected glory”. For example, if students compare their own accomplishments with those of classmates in academically selective schools, then their academic self-concept should decline; a negative BFLPE or contrast effect (e.g., there are a lot of students better than I am so I must not be as good as I thought). Alternatively, affect, identification, self-perceptions, and self-concept may be enhanced by membership in groups that are positively valued through the reflected glory of accomplishments or good qualities of other group members and should result in a positive BFLPE. There is ample evidence that people enjoy basking in the reflected glory of successful others by merely associating with distinguished individuals or joining highly valued social groups (e.g., Cialdini & Richardson, 1980; Snyder, Lassegird, & Ford, 1986; Tesser, 1988). Based partly on this theoretical perspective, Marsh (1984a, 1993 also see Felson, 1984; Felson & Reed, 1986; Firebaugh, 1980) argued that students in academically selective schools might have more positive academic self-concepts by virtue of being chosen to be in a highly selective educational program--an assimilation, reflected glory, identification, or labeling effect (e.g., if I am good enough to be in this selective school with all these other very smart students, than I must be very smart). A reflected glory effect would be particularly likely if the selection was highly valued and if the selection process was highly visible with important implications.

There is considerable social comparison research (Buunk & Ybema, 1997), showing that people cope with stress by choosing downward comparison targets that make them feel relatively better and protects their self-esteem (Lazarus & Folkman, 1984; Wills, 1981) or by choosing upward comparison targets for purposes of identification, aspirations, affiliation, and obtaining useful information or coping strategies (e.g., Buunk & Ybema, 1997; Taylor & Lobel, 1989). Thus, individuals prefer upward comparisons that facilitate identification and being like the comparison targets, but not when forced to contrast their own poorer attributes with the better attributes of upward comparison targets. Downward comparisons are preferable when they facilitate contrast of one’s own attributes with those of others who have poorer attributes, but not when the comparison leads to identification with or perceiving oneself (or being perceived by others) as being similar to the downward comparison target. Diener and Fujita (1997) referred to this as situationally imposed or forced comparisons as opposed to a more flexible situation in which individuals have considerable freedom to select or construct consciously a comparison target so as to maximize various goals. They suggested that there is limited support for social comparison theory in this forced comparison setting, but emphasized that school closely approximates a “total environment” (where the frame of reference affecting judgment is limited to the immediate context) implicit in the forced comparison. The school is a total environment in that there are so many inherent constraints and a natural emphasis on social comparison of achievement levels in a school setting. Similarly, educational psychologists (e.g., Covington, 1992; Marsh, 1990a; 1993; Marshall & Weinstein, 1984; also see Goethals & Darley, 1987) emphasize the extreme salience of achievement as a reference point within a school setting, particularly when the outcome measure is academic self-concept.

Both the counter-balancing negative social comparison effects and positive reflected glory effects are likely to affect self-concept so that the typically observed BFLPE is actually a net
effect (Marsh, 1984a, 1993). An assimilation effect may operate even though the social comparison contrast effects overshadow it. McFarland and Buehler (1995) found that students from collectivist countries experienced significantly smaller BFLPEs than students from individualistic countries. They also noted an asymmetry such that individuals who value group membership can focus on their individual performances when they do well or on the performance of their group when they do poorly, thus allowing them to protect their self-concepts. Based on their findings, they proposed a revision to the BFLPE metaphor: “although everyone feels good about being a big fish in a little pond, not everyone feels bad about being a little fish in a big pond” (p. 1068).

**The Investigation**

Two studies were conducted in analyzing 275 swimmers from 30 nations participating at the Pan Pacific Championships, Sydney Australia August 1999 and the 5th World Short Course Championships, Athens Greece, March 2000. The measurement instrument was the Elite Swimmer Self Description Questionnaire (ESSDQ). This instrument is a 34-item questionnaire adapted for this study from the Elite Athlete Self Description Questionnaire (EASDQ). In adapting this instrument the basic categories and items have remained; Skills, Body, Aerobic Competence, Anaerobic Competence, Mental Competence, and Overall Performance; while the response set has been directed to individual swimming events as opposed to general sport related self-concepts. Swimmers are asked to prioritise their events as most elite swimmers swim more than one event and distance. The ESSDQ also asks questions related to national pride, nations international competitiveness, recognition of swimming within the nation, and swimmers expectations of a quality performance allowing examination of possible frame of reference effects. In order to examine differences across countries the ESSDQ was translated into Spanish, German, Italian, Korean, Japanese, and Chinese.

Swimming performance was analyzed by computing an International Point Score (IPS) on their entry times for each event swum and an IPS for their performances at the meet in question. The IPS is an internationally recognized numeric determined by averaging the 5 fastest times swum in a particular event and setting that time to a standard of 1000 points. Times are then set incrementally above and below 1000 and assigned a commensurate point value. In addition, a National World Ranking per event was computed by averaging the two fastest swimmers world rankings from a given nation in a particular event. Where one swimmer falls outside the top 50, the ranking was determined by averaging the ranked swimmer with a score of 51. Where both swimmers fall outside the top 50, that nation was unranked in that event. A cumulative National World Ranking was calculated by averaging all of the National World Rankings per event.

**Data Analysis**

Confirmatory Factor Analysis was conducted on the data to determine the goodness of fit between the EASDQ factors and the responses on the ESSDQ. An examination of the relationships between the dependent measures was conducted through the use of Multilevel Structural Equation Modeling.
Results & Discussion

Confirmatory Factor Analysis.
The ESSDQ was adapted to swimming based on the widely used EASDQ. For the reason it was important to evaluate support for the a priori factor structure and its generalisability over different groups. In preliminary analyses, CFAs were done for the entire set of ratings (across all swimmers and all events) and separately across the set of “best” events, the set of second best events, etc. These results each demonstrated that the six a priori factors were clearly demonstrated.

Next, we conducted multiple group CFAs across six categories of events (selected so that that events within each classification were maximally similar, but that there was at least 100 cases within each classification). In tests of the invariance of the factor structure, there was clear support for the invariance of the factor loading for the different factors and for the correlations among the factors. Again, the a priori factors were well defined and clearly identified. (see Table 1).

In summary, confirmatory factor analyses indicated good support for invariance of ESSDQ a priori factor structure across country and events.

Causal ordering.
We predicted a priori that self-concept would contribute to performance above and beyond the effects of prior personal best performance (inferred on the basis of international point scores). In order to evaluate this question, we computed total scores across the events that a swimmer competed for prior physical self-concept (averaged across events and self-concept scales), prior personal best in (IPS average across events in which a swimmer participated), and actual performance (IPS averaged across performances in events which a swimmer participated). Results show that ESSDQ total self-concept scores were highly correlated with both pre-test IPS (r = .37) and subsequent actual performance at the championships (r = .37). For this group of elite swimmers, pre-test IPS (previous personal best) was very highly correlated with actual performance at the championship (r = .93). However, prior Elite Athlete self-concept had a significant effect on actual performance at the championships (standardize beta = .10, p < .001) beyond the very substantial effect of prior personal best (standardize beta = .89, p < .001).

We then evaluated the path models separately for the specific events that each swimmer listed as their best event and second best event. The results based on the total scores averaged across all events were replicated. Whereas the most important determinant of actual performance of priori personal best in the same even (standardized beta = .85 & .86 for best and second best event), the effect of prior self-concept was highly significant (standardized beta = .14 & .12 for best and second best event). Hence, prior self-concept in specific events had a slightly greater influence on actual performance in specific events – compared to results based on the total scores. In contract, prior personal bests had a slightly smaller influence on actual performance in a particular even than was observed for analyses based on the total scores.

In summary, path analytic models demonstrated that prior physical self-concept had a significant effect on subsequent swimming performance at an international championship beyond the influence of prior personal best performance in the same event.
Frame of Reference Effects: The Big Fish Little Pond Effect.
Based on previous theoretical and empirical work with the big-fish-little-pond effect, we predicted that overall country ranking (based on international rankings) would have a negative effect on ESSDQ responses (the negative social comparison or contrast component), but that pride with national team (the positive “reflected glory” or assimilation component) would have positive effects on ESSDQ. In order to test this prediction, we evaluated for each swimmer the international ranking for the country of the swimmer, the swimmer’s self-rated pride in being a part of the national swimming team, the swimmer’s previous personal best, and the total Elite Athlete self-concept score. Initially, we tested the a priori predictions based on the total scores averaged across all events. Even after controlling for previous personal best, total self-concept at the start of the championships was negatively (unfavourably) influenced by country rank (-.31), but was positively (favourably) influenced by pride with being on the national team (.51).

We then evaluated the same path models separately for the specific events that each swimmer listed as their best event and second best event. The results were generally similar to those based on the total scores averaged across all events. Thus, total elite athlete self-concept was negatively (unfavorably) influenced by country rank (standardized betas of -.18 & -.31 for best and second best events respectively), but was positively (favorably) influenced by pride with being on the national team (.38 & .39). We note, however, that particularly that the country rank and country pride scales are substantially correlated (-.8, higher rank associated greater pride) so that there is substantial multicollinearity in the models that contain both these effects.

In summary, consistent with big-fish-little-pond effect, country ranking had a negative effect on Elite Athlete self-concept, whereas pride with national team (“reflected glory effects”) had positive effects on Elite Athlete self-concept.

References


Appendix

Elite Swimmer Self Description Questionnaire

Skills
1. I am a most skillful swimmer in this event.
2. My technical skills in this event are better than most at my level of competition.
3. I recognise myself as very skillful in this event.
4. Coaches and competitors at my level of competition see me as very skillful in this event.
5. I excel because of my skill level in this event.

Body
6. I excel because of the suitability of my body composition to this event.
7. I excel because of the suitability of my body shape to this event.
8. I excel because of the suitability of my body structure to this event.
9. Having the right body helps me perform well in this event.

Aerobic Competence (long sustained intensity, endurance)
10. Compared to my competitors at my level, I am aerobically superior in this event.
11. My capacity for endurance makes me a good performer in this event.
12. I excel in this event because of my good aerobic fitness.
13. Coaches and other competitors at my level see me as very fit aerobically in this event.

Anaerobic Competence (short bursts of high intensity)
14. Compared to others at my level, I am anaerobically superior in this event.
15. My capacity for short bursts of high intensity activity makes me a good competitor in this event.
16. Coaches and other competitors at my level see me as very fit anaerobically for this event.
17. I excel in this event because of my good anaerobic fitness.
18. In this event, I am more anaerobically powerful than others at my level of competition.

Mental Competence
19. I am mentally a very strong competitor in this event.
20. I have better mental skills than others at my level in this event.
21. Coaches and other competitors at my level, see me as a very focussed competitor in this event.
22. In this event, I am mentally able to motivate myself appropriate to the situation when necessary.
23. I am mentally able to focus my attention on the appropriate things when performing in this event.

Overall Performance
24. I consistently perform to the level of my ability in this event.
25. My performance in this even overall is particularly good for important competitions.
26. My performance in this event consistently meets my goals or expectations.
27. I am consistently able to give my best overall performance in this event.
28. I excel in this even because I am able to give a peak performance when necessary.
29. I am consistently able to “pull it all together” (the skills, body, aerobic, anaerobic and the mental side of things) when performing in this event.
Table 1: Factor Structure Across Six Event Categories

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Note. Results are based on a multiple group confirmatory factor analyses in which the six event categories were: 1 ‘50-100m free’; 2 ‘200-1500 free’; 3 ‘50-200 back’; 4 ‘50-50-200 breast’; 5 ‘50-200 fly’; 6 ‘other’. For this model, all factor loadings and factor correlations were constrained to be invariant (equal) across the six groups so that only one set of factor loadings and factor correlations is presented.