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Sport commitment and deliberate practice among male and female triathletes

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Performance times in triathlons and long distance swim events can be reliably predicted from hours in sport-specific deliberate practice activities (Hodges et al., 2004). In the current study we examined whether commitment to the sport could be a possible mediator of practice and subsequently performance. Recreational triathletes of varying skill levels, sex and age (N = 90) were surveyed about their current practice habits as well as ratings for current levels of commitment based on Scanlan et al. (1993)'s sport commitment model. Current practice behaviours as ascertained from practice history questionnaires and yearly periodization schedules, pertaining to both hours and intensity of practice, were positively related to sport commitment in this sample. Past practice amounts (i.e., accumulated practice and years of involvement) were not significantly related to sport commitment, although they did significantly relate to performance times, supporting previous research. Commitment and current performance times were not related. These data lead us to conclude that sport commitment is a good predictor of current behaviours, but that it appears to only be a transient measure, showing little to no relationship to past practice habits and current levels of performance. In future research it will be important to track practice and sport commitment over a longer time period to both ascertain the direction of this relationship (i.e., antecedent or consequence of sport commitment) and whether commitment to the sport has any predictive validity with respect to future practice amounts (and ultimately performance).

KEY WORDS: Development, Expertise. Motivation Skill acqusition. Talent identification.

Introduction

In 1996, Starkes and Hodges published the first sport-specific test of deliberate practice theory among club level and elite (current and retired) Olympic-style wrestlers. Hours accumulated in team and individual practice

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differentiated across skill class, and practice was generally rated as physically and mentally effortful (high in concentration) and highly relevant to improving performance. In this study, as in subsequent studies, athletes also rated the practice activities as 'highly enjoyable' (which was not a requirement of deliberate practice as originally defined by Ericsson, Krampe & Tesch-Römer, 1993). Although in later work enjoyment was shown not to reliably covary with the effort and perceived relevance of an activity to improving performance (among triathletes and swimmers based on diary data, Hodges, Kerr, Starkes, Weir & Nananidou, 2004), the question as to what drives athletes to expend so much time and effort to achieve success in sports continues to remain elusive. The purpose of this study was to evaluate whether sport commitment could explain the variance in hours of practice (and ultimately performance). Specifically, we were interested in the relationships between various practice behaviours (past and current practice amounts as well as the current intensity of practice) and sport commitment.

Deliberate practice is defined as effortful practice that is designed to improve performance (Ericsson et al., 1993). It was also defined as being inherently low in enjoyment, such that enjoyment was not seen as the primary reason for engagement in deliberate practice. Importantly, it needs to be sustained over many years for success. Practice amounts have been shown to be related to skill level in a number of studies comparing across elite and less elite peers (for reviews see Côté, Ericsson & Law, 2005; Starkes & Ericsson, 2003; Ward, Hodges, Starkes & Williams, 2004) as well as to actual race times in swimmers and triathletes (accounting for ~20-60 % of the variance, Baker, Deakin & Côté, 2005; Hodges et al., 2004). We also know that the type of practice that best differentiates across performance level or skill groups is practice that is specific to the sport, rather than general fitness activities or practice/ participation in other sports (e.g., Ward et al., 2007; Hodges et al., 2004; Baker, Deakin & Côté 2005). For example, in female triathletes (athletes who compete in 3 events within one race: swimming, cycling and running), sport-specific practice accounted for 38 % of the variance in performance times. Based on these results, the primary reason for the current analysis and study was to evaluate potential drivers underlying extended deliberate practice within a sport. As detailed below, a potential variable that has been thought to be related to persistence within a sport is that of sport commitment.

Sport commitment is defined as the "desire and resolve to continue participation in sport" (Scanlan et al. 1993, p6). Enjoyment is consistently shown to be one of the best predictors of sport commitment, although athletes routinely rate practice activities as high in enjoyment and hence this variable often shows little variation across athletes and can lack predictive validity (Crocker &

Augaitis, 2010). Similarly, in ratings of deliberate practice type activities, athletes routinely rate practice behaviours as high in enjoyment, yet this variable rarely differentiates across individuals and does not covary in any systematic way with relevance of the activity to improving performance (Hodges et al., 2004). Other predictors of sport commitment are: involvement alternatives, involvement opportunities, social supports and constraints and personal investments (Carpenter & Coleman, 1998; Scanlan, Carpenter, Schmidt et al., 1993).

There is the general expectation that sport commitment should predict practice behaviours (e.g., Helsen et al., 1998; Weiss & Ferrer-Caja, 2002; Weiss & Weiss, 2003), including effort (i.e., intensity of practice) and persistence (amount & years of practice). However, to date, practice behaviours in sport have not been studied with respect to sport commitment. Although it is clear that practice behaviours could be considered as potential antecedents of current sport commitment (e.g., accumulated practice amounts), practice behaviours should also be a consequence of sport commitment, with sport commitment potentially predicting current (and future) amounts and intensity of practice.

Quantitative differences with respect to commitment have been noted across skill groups (e.g., Casper & Andrew, 2008; Weiss & Weiss, 2007), although the focus in this past research has been on predictors of sport commitment, rather than potential consequences with respect to practice and ultimately performance. For example, Weiss and Weiss (2007) showed that among youth competitive gymnasts, social supports differentiated across skill class; whereas among adult college tennis players (Casper & Andrews, 2008), both social constraints and enjoyment differentiated college from recreational tennis players, with college athletes showing lower levels of enjoyment, but higher levels of involvement opportunities. Moreover, to date, studies related to sport commitment and performance have been mostly cross-sectional in nature (comparing across more skilled and less skilled athletes). Scanlan, Russell, Beals and Scanlan (2003) conducted in depth interviews on the New Zealand all blacks. Personal investments were important for the majority of the players in keeping them committed to playing, although it was not the fear of losing their investment that kept them playing (committed), but rather the knowledge of the effort, time (and money) expended. This detailed work by Scanlan and colleagues underscores the importance of time invested (accumulated hours of practice) as a driver of sport commitment and continued involvement. Similar conclusions regarding the importance of personal investments for sport commitment were also made based on research with Master's swimmers who were followed up over 2 different time points (Young & Medic, 2011; Young, Piamonte, Grove & Medic, 2011). Again, it was personal investments that were most related to measures of sport commitment.

In sports such as running, swimming, cycling, and sports where all three are combined (i.e., triathlon), actual performance times are available enabling a discriminatory analysis of the role of sport commitment and practice behaviours on performance. Crocker and Augaitis (2010) evaluated predictors of sport commitment within a group of triathletes of varying skill levels. This study was specifically designed to test the predictors (antecedents) of the sport commitment model in adult athletes in addition to determining potential gender differences underlying sport commitment. Social support was not significantly related to sport commitment, whereas involvement alternatives, opportunities and personal investments were the best predictors (enjoyment was dropped from the analysis due to low variance and a high degree of negative skewness related to high ratings for this variable). The relationship of these predictors to sport commitment was shown to be independent of gender (yet see Wigglesworth, Young, Medic & Grove, 2012).

At the time of data collection, the authors of this study (Crocker & Augaitis, 2010) also collected practice history data pertaining to hours spent in practice, periodization of training with respect to intensity of training as well as performance times. However, these data were not analyzed and reported in this earlier paper due to a chosen focus on testing the model of sport commitment and in particular, antecedents of sport commitment. In the current paper we present these data and analyses, where we specifically focus on the relationship between three types of practice behaviours: current hours / week, accumulated practice estimates and current hours of medium-high intensity practice. This latter estimate is based on data from periodization of sport where athletes report on how they divide their training year with respect to 4 time periods (off-season, base-season, training and competitive season) and report hours/week in these different times of the year as well as their intensity of practice (low, medium, high).

Practice periodization has received some attention in the sport training literature with respect to skill and performance, although the literature is rather sparse (for a definition see Kent, 1994). For example, Baker, Côté and Deakin (2005) studied expert, ultra-endurance triathletes with respect to how they organized their training season. They showed that periods of high demands were typically followed by periods of low demands for the best athletes (supporting research from early deliberate practice work and the importance of rest following intense, effortful practice for elite musicians, Ericsson et al., 1993). The best athletes also showed a more rapid build-up of training intensity and amount across a 12-month season than the slower athletes, resulting in longer periods within a year of high intensity training. In view of the suspected relationship between effort, investment and sport commit-

ment, in the current study we determine whether time spent in this medium to high intensity training/ year is related to sport commitment.

Performance times have been shown to be related to age across events such as running and swimming (e.g., Schulz & Curnow, 1998; Weir, Kerr, Hodges, McKay & Starkes, 2002), with general declines in performance in longer distance events happening past 30 years of age. Therefore, in our current analysis we control for age when running our analysis. Moreover, we also provide age and gender standardized performance times in order to determine the relationship between performance and commitment and present demographic information based on gender and age sub-groups.

We predicted that sport commitment would be positively related to current measures of practice (i.e., amount and effort) and although to a lesser degree, we also predicted positive relationships between accumulated practice and sport commitment as well performance times. Because this research is not longitudinal, any conclusions about directions (i.e., cause and effect) are cautious. However, we suspect that current levels of sport commitment will be most highly related to current levels of practice (both intensity and amounts), with the assumption that current levels of commitment cause continued participation and hence predict current practice. However, we also predicted that past practice behaviours would be related to sport commitment (and hence performance times), although in this case we suspected that past practice amounts (which would be related to the sport commitment predictor variable, personal investments), would be the cause of high levels of sport commitment. We appreciate that current and past practice amounts typically show moderate correlations, so there are difficulties inherent in making independent conclusions about potential relationships. However, as a first attempt to ascertain these relationships, we looked at past and current practice independently. Finally, because of the established relationship between accumulated practice hours and performance, we also studied the relationship between performance and sport commitment. In short, we were interested in whether sport commitment is related (and potentially predictive) to training behaviours (deliberate practice) and ultimately performance.

Methods

Participants

From an original sample of (N = 144) recreational adult triathletes, 90 provided completed information about their sport behaviours (practice history and current practice amounts and intensity), performance times (current year Olympic triathlon times) and com-

mitment to the sport of triathlons. The participants were recruited at three different triathlon races, at a triathlon expo, and from various club work-outs throughout greater Vancouver, BC, Canada (for details see Crocker & Augaitis, 2010). From this reduced sample, there were 39 females ranging in age from 19 to 52 yr (M = 33.6 yr, SD = 8.9) and 51 males ranging in age from 21 to 72 yr (M = 38.7 yr, SD = 12.5). Participants lived and trained in various cities throughout the provinces of Canada. Because of the wide age range in these athletes, for presentation of data we further subdivided our sample based on age, such that for the females 17 were classed as "younger", (30 yr or younger, M = 25.41, SD = 2.61 yr) and 22, older (32 yr or older; M = 39.95, SD = 6.48 yr). For the males, 16 were classed "younger" (M = 25.44, SD = 2.97 yr) and 34 were "older" (m = 45.06, sd = 10.14 yr).

With respect to performance times for the females, times ranged from 126 - 195 min (see Table I). although these were all recreational triathletes, eleven female athletes were currently recording olympic distance triathlon times of 150 min or less which would be considered relatively elite (all but two in the younger age group). the current olympic time is ~120 min, for females (london olympic games, 2012). for the males, the times ranged from 118 – 225 min. eleven of the males were competing within 135 min or less (4 in the older age group; the current Olympic time is ~15 min faster than for the females: 106 min, London Olympic Games, 2012).

Scales and data reduction

A slightly modified version of the sport commitment scale (Scanlan, Simons et al., 1993) was used in order to make the questions relevant to the sport of triathlon. This included four questions that were rated on a Likert type scale from 1-5 (where 1 = not or nothing and 5 = Very/ a lot): Dedication to participating/practicing triathlons; difficulty quitting; determination to keep participating in triathlons and willingness to do more to keep participating in triathlons. Scale scores were derived from adding scores for each question and dividing by 4 (no. of items), to give a global score of sport commitment (ranging from 1-5). In previous research, scores from this scale have shown acceptable scale reliability and factorial validity (Carpenter et al., 1998; Scanlan, Simons et al., 1993). In the original analysis of this scale (Crocker & Augaitis, 2010), good internal consistency was again demonstrated (α = .82).

Table I
Average (SD) Performance Time and Practice Data as A Function of Gender And Age-Group

	Times (s)	**Current practice (hr)**		**Past practice**		
	Actual	**History**	**Period**	**Intense**	**Accum (hr)**	**#yrs**
Males:						
Young	142.6 (16.8)	588.4 (396.8)	615.3 (304.3)	473.3 (246.6)	2491 (1874)	5.6(3.4)
Older	162.2 (24.9)	537.2 (259.2)	526.1 (240.4)	380.0 (233.8)	2980 (3183)	6.7(5.2)
Females:						
Young	153.6 (17.4)	637.8 (226.3)	647.3 (206.7)	486.6 (198.3)	2500 (1824)	5.2(2.9)
Older	183.1 (45.3)	552.4 (287.0)	537.7 (132.3)	394.3 (149.4)	2392 (2244)	4.1(3.5)

Note: Current practice estimates were obtained from the History questionnaire, the periodization (period) questionnaire and from estimates of hours spent in medium-high intensity practice (Intense) from the periodization questionnaire. Accum = accumulated hours based on the History questionnaire, #yrs = number of years of involvement in triathlons.

We used a practice history questionnaire designed to probe triathlon-specific practice hours that was based on one developed by Hodges and Starkes (1996) and subsequently modified by Hodges et al. (2004) to be specific to triathletes. Participants answered questions pertaining to their current performance times in Olympic distance triathlons (1.5 km swim/40 km bike /10 km run), their current age and start age in triathlons (either training or competing) as well as completing two training history scales: one designed to probe accumulated practice hours (retrospective practice history questionnaire) and the other designed to probe current practice amounts with respect to seasonal variations in effort/intensity (so termed the periodization questionnaire). We did not ask questions about involvement in other sports or activities outside of triathlons (swimming, running and biking).

For the retrospective practice history questionnaire, athletes first entered their current age and then worked backwards in time (last year, 3 years ago, 6 years ago, 9 years ago etc) entering their ages at these respective time points (the last column was reserved for "start age"). They then answered the average number of hours/ week they remembered training for triathlons for each of these time periods. They were also asked to give an indication of weeks off/year. From these data we were able to calculate current yearly practice amounts as well as accumulated practice based on a simple algorithm whereby hrs/week were multiplied by 52 weeks (minus number of weeks off /year). For missing years we used linear interpolation to calculate average hours in practice during that year (see Hodges & Starkes, 1996).

For the periodization questionnaire, participants were asked to fill in average hours per week in their most recent training season (i.e., a one year period) that were spent in base training (~Dec-Feb), pre-race (~Mar-May), race (~June-Aug) and off-season (~Sep-Nov). They were asked to also rate the intensity of training at these different periods as low, moderate or high (1-3 scale). Hence, we were again able to calculate current year practice amounts (multiplying by 52 weeks, minus weeks/year off). These current amounts also enabled a reliability analysis with the practice history data (% agreement = 81%). Finally, total hours spent in medium-high intensity practice for the most recent year were tallied, allowing for a good approximation of effortful practice.

With respect to statistical analyses, some simple between group comparisons based on gender and age were performed. This allowed determination as to whether sport commitment in general differed as a function of these variables, as well as presentation of some basic descriptives about the potential skewness/normality of these scale values. A 2x 2 between groups ANOVA was used for assessment of differences. We also considered the practice and performance data as a function of age and gender in order to provide some demographic information on the participants and to again alert as to any potential age and gender differences with respect to practice and performance. These data were analyzed as a function of current practice data based on yearly practice estimates from the practice history questionnaire, the periodization questionnaire and estimates of yearly practice based on time in medium-high intensity practice. These data were analyzed in a 2 Gender x 2 Age x 3 Practice measure ANOVA, with repeated measures on the last factor. Separate 2 x 2 between-group ANOVAs were used to analyze accumulated practice hours, years of involvement and performance times. We had expected that the older athletes would have accumulated more practice hours than the younger athletes and that the males would have faster performance times than the females.

The primary analysis was based on partial correlations, controlling for age, to ascertain relationships between sport commitment and current and past practice behaviours as well as performance times. To additionally assess the potential relationship between commitment and

performance times, we standardized the athletes' times based on North American times for the Age-group National championships in triathlon 2013, which was held in Milwaulkee, Wisconsin (http://www.runtri.com/2013/08/average-time-to-finish.html). This web site gives age and gender based average performance times of the best National-level triathletes. We subtracted the world time from their current time and positively normed all the values by adding the values (+1) of the largest negative value to each score. Analyses were conducted using SPSS, v22 and the criteria for statistical significance was $p < .05$.

Results

Sport Commitment

We first compared across the two genders and two age groups on the sport commitment scale (1-5) to determine whether sport commitment covaried as a function of gender or age. The means were as follows: males-younger, $M = 3.88$, $SD = .66$ (range = 2.75-5); males-older, $M = 3.90$, $SD = .82$ (range = 1.5-5); females-younger, $M = 3.87$, $SD = .68$ (range = 2.5-4.75); females-older, $M = 4.15$, $SD = .87$ (range = 2.25-5). The data were normally distributed (kurtosis = .19) with a relatively small amount of negative skewness (-.54), due to values being just above the midpoint of the scale. Based on a 2 Gender x 2 Age-group, univariate ANOVA analysis, there was no significant gender effect ($F<1$), although the age effect trended in the direction of the older athletes scoring more highly for commitment than the younger athletes, $F(1,85) = 2.26$, $p = .14$, $\eta_p^2 = .03$. There was no interaction between the two ($F<1$).

Practice demographics

The means for the various practice variables are shown in Table 1 as a function of gender and age group. In terms of current practice estimates, there were no gender effects (all $Fs<1$). The age group effect was not significant, although there was a trend for the younger athletes to be doing more current practice than the older athletes, $F(1,82) = 3.19$, $p = .08$, $\eta_p^2 = .04$. The only statistically significant difference was with respect to the estimates of current practice, $F(2,164) = 28.96$, $p<.001$, $\eta_p^2 = .26$. Not surprisingly, estimates of medium-high intensity practice/year were significantly less than estimates of yearly practice estimates in general, with the data from the practice history questionnaire and the periodization questionnaire not differing from each other (see Table I).

In terms of years of involvement, age did not differentiate the younger and older athletes, $F<1$, although there was a trend for the males to have been

involved in triathlons longer than the females, $F(1,85) = 2.82$, $p = .10$, $\eta_p^2 = .03$ (males-younger, $M = 5.63$ yr, $SD = 3.44$ (range = 1-11yr); males-older, $M = 6.74$ yr, $SD = 5.24$ (range = 1-19); females-younger, $M = 5.18$ yr, $SD = 2.88$ (range = 1-10); females-older, $M = 4.09$ yr, $SD = 3.06$ (range = 1-18)). The interaction was not significant, $F(1,85) = 1.42$, $p = .24$. There were no significant age-group or gender effects for accumulated hours in practice (all $Fs<1$).

Performance times

Not surprisingly for performance times, there were age-group, $F(1,85) = 14.45$, $p<.001$, $\eta_p^2 = .15$ and gender effects, $F(1,85) = 6.12$, $p<.05$, $\eta_p^2 = .07$, but no interaction. The males were faster than the females and the younger athletes were faster than the older athletes. Standardizing these times had the effect of removing any gender differences, yet age-group differences still remained.

Partial correlations

The partial correlations, after controlling for age, between the various measures of practice, performance times and commitment are detailed in Table II. Commitment was significantly related to current practice behaviours only (i.e., hours spent in the current year in practice in addition to the amount of hours in practice rated as medium-high intensity). As expected, accumulated practice was negatively related to overall performance times, but it accounted for only ~7% of the variance in the data ($r = -.26$). There was also a similar magnitude significant relationship between number of years of involvement in triathlons and performance times. Accumulated practice hours were not, however, significantly related to commitment ($r = .15$), neither was commitment significantly related to performance (either actual performance times or age and gender standardized times). With respect to reliability, the hours/year calculated from the practice histories were highly correlated with those data collected from the periodization records ($r = .67$).

Discussion

Is sport commitment related to practice behaviours?

Sport commitment was indeed significantly related to current practice behaviours. The correlations with current practice estimates would be con-

TABLE II
Partial Correlations (Controlling For Age) for the Whole Sample Between Sport Commitment, Current Yearly Practice Estimates, Past Practice Behaviours and Performance Times (Both Actual And Age-Gender Standardized)

	Times (s)		Current behaviours (hr)			Past behaviours (hr)	
	Actual	**Stand**	**History**	**Period**	**Intense**	**Accum**	**#yrs**
Commit	.02	-.03	.26*	.43**	.42**	.15	.02
Actual		.95**	-.08	-.15	-.08	-.26**	-.33**
Standard			-.10	-.17	-.09	-.26**	-.30**
History				.67**	.57**	.18	.01
Period					.89**	.31**	.14
Intense						.24*	.11
Accum							.77**

Note: *= $p<.05$; **= $p<.01$. "Commit" = commitment, "History" = Yearly practice hours calculated from the practice history questionnaires, "Period" = Yearly practice hours calculated from the periodization questionnaire, "Intense" = yearly practice hours at medium-high intensity practice. Actual and "Stand" or Standard refer to actual performance times and age and gender standardized times. Accum = accumulated hours based on the History questionnaire, #yrs = number of years of involvement in triathlons.

sidered moderate (ranging from $r = .26$ to .43, accounting for ~14% of the variance in the data). Although our measure of current intensity of practice was highly correlated with current practice estimates (based on both the practice history questionnaire and the periodization questionnaire), it is notable that this more effort-related variable was positively correlated with commitment. This finding concurs with previous sport commitment research where variables related to investment and effort have been shown to be good predictors of sport commitment (e.g., Scanlan et al., 2003; Young & Medic, 2011). Although we only took a relatively gross measure of intensity of practice (in other research, intensity has been assessed using heart rate zone; Baker, Cote and Deakin, 2005), our measure of practice periodization did show that the more committed athletes were not only doing more practice, they were doing more intense practice, at least based on self-report.

Despite the observed relationships between commitment and current estimates of practice, there was no relationship between sport commitment and past-measures of practice or number of years of involvement in triathlons, which was somewhat surprising given the emphasis on personal investments as significant antecedents of sport commitment (e.g., Crocker & Augaitis, 2010; Young et al., 2011). Personal investments are obviously more than just time and effort (also relating to money for example) and these investments might also be considered on a more transitory nature (i.e., how much have I invested this year), rather than across a longer time span. Indeed, the personal investment questions used in the original analysis by Crocker and Augaitis (2010) asked questions about time, money and effort

related only to the current season/year. Therefore, our data nicely support other data on sport commitment with respect to current personal practice investments as antecedents of current sport commitment, but not with respect to long term investments in practice. However, it is important to consider some limitations with our data that might moderate these conclusions.

Triathlon is a particularly difficult sport to measure accumulated practice amounts. One of the reasons for this difficulty is because of the relatively late start age of athletes competing in this sport and the potential influence of prior training in other sports. In this study we only collected data pertaining to training in triathlon related sports (i.e., swimming, biking and running), hence potentially underestimating accumulated practice for some of the athletes. Second, it is possible that the potential relationships between practice (current and past) and commitment are attenuated due to some skewness in the commitment data. The range of values was more represented in the 2-5 range rather than 1-5 range and the average sport commitment score was around 3.9 (there were no gender related differences, only a trend for the older athletes to show higher values for sport commitment than the younger athletes). It is of course not too surprising that commitment was generally quite high, given that these athletes were all currently competing in triathlon events, but the lack of relationship between commitment and past practice/years of involvement could at least in part be related to the range of the scale.

It is also important to note that we are unable to say anything conclusive about the predictive capability of sport commitment in relation to future practice behaviours as we only had measures of current and past practice. The relationship between current practice behaviours and commitment might be suggestive of a cause and effect relationship, with higher commitment leading to engagement in more and more intense practice in the current year, but it would of course be beneficial in future research to collect data on practice behaviours at multiple time points (see for example Young & Medic, 2011) to more stringently test the predictive validity of this measure. At the moment, we are only able to conclude that past practice amounts and behaviours do not appear to be good predictors of sport commitment, but that current practice behaviours are related to commitment.

Do sport committed athletes do better?

We did not find any evidence that the more committed athletes did better (i.e., were faster), than the less committed athletes. This is not surprising given that we also did not see any significant correlations between accumu-

lated practice amounts (the best predictor of performance) and sport commitment. What these data do tell us is that commitment to sport is not related to how good a person is at the sport (at least at a social comparative level) and hence, perhaps sport commitment is more likely to be reflected by personal goals and aspirations. Indeed, sport commitment, as described by Scanlan and colleagues (1993), does not necessarily reflect desire to train hard or win, but just the resolve to continue in a sport. Therefore, if sport commitment is not related to performance and only related to current practice, it is important to question whether sport commitment is an important variable to consider in predicting whether someone will invest the necessary practice to succeed or excel in sport. Although longitudinal analysis is needed to address this question properly, based on the data from this study and the lack of relation between past practice, performance and sport commitment we would be hesitant in making recommendations about future deliberate practice and success based on current ratings of sport commitment.

It is necessary to acknowledge some potential issues with respect to making conclusions about the relationship between performance and commitment based on these data. We know that many triathletes start this sport later in development (typically after some success in related sports, such as swimming), so that the relationship between accumulated practice and performance, as well as potentially the relationships between these variables and commitment, will be somewhat masked by prior practice history in other sports (that we did not measure in this study). Moreover, performance times in triathlons are less likely to show strong relationships to practice as single sport events due to the fact that performance is dependent on success in 3 sports and it is difficult to predict overall performance based simply on a summation of the time in these different sports.

Conclusions

In relating these data to previous work on sport commitment, we have provided the first evidence that sport commitment is positively related to current practice behaviours in various groups of triathletes that vary in gender, age and performance times. Generally these data were consistent across these variables, showing that sport commitment was independent of performance times, gender and age and that it was reliably related to current practice behaviours (both amounts and intensity). We do not know whether sport commitment should be considered a consequence of practice (with respect

to personal investments) or whether practice behaviours should be considered a consequence of sport commitment. Because we saw no significant relationships between past practice amounts, current performance and sport commitment we have reason to doubt its long term predictability with respect to future success in a sport. Instead, we suspect sport commitment captures a transitory feeling or opinion towards a sport or a desire to continue practice, without necessarily a desire to continue deliberate practice designed to improve performance and reach elite levels of skill.

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