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Shorter Communication

Low fear in childhood is associated with sporting prowess in adolescence and young adulthood

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Abstract

This study sought to establish if low levels of childhood fear were associated with high level sports performance in adolescence and young adulthood. Parent and teacher reports of fearfulness at ages 5, 7, 9 and 11 and self-reports of sporting achievements at age 26 were obtained for members of the longitudinal Dunedin Multidisciplinary Health and Development Study. Findings indicated a dose–response relation between levels of childhood fear and later sports achievement such that low levels of fear were associated with the greatest likelihood of playing representative sport. Low levels of fear early in life may be associated with elite sports performance in adulthood.

Keywords: Fear; Sport; Physical Activity; Longitudinal; Adolescence

1. Introduction

The majority of the fear literature is aimed at understanding the causes and consequences of high levels of fear. Far less attention has been paid to the correlates of low levels of this continuously distributed trait (Marks & Nesse, 1994). In this regard, evolutionary theorists have posited negative consequences of very low levels of fear or anxiety (Marks & Nesse, 1994; Nesse, 1999), but there is a paucity of data to support these contentions (Nesse, 2001). Perhaps the strongest evidence to date in support of this evolutionary hypothesis comes from a study in which low levels of height fear were associated with more injurious falls in childhood (Poulton, Davies, Menzies, Langley, & Silva, 1998).

Adopting an evolutionary view of fear implies that low levels of fear may also carry some

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selective advantages (Stearns, 1999; Trevathan, Smith, & Mckenna, 1999). We sought to test this possibility by examining the relation between low levels of childhood fear and high levels of sporting achievement in adolescence and young adulthood. We chose to examine those who had played representative sports as our outcome variable because the literature on high level sports performance has lacked a longitudinal perspective [Thomas & Thomas (1999); though see Baxter-Jones, Helms, Maffulli, Baines-Preece, & Preece (1995)], with most studies focussing on proximal predictors such as the amount or type of practice and preparatory training (Ericsson & Charness, 1994; Hodges & Starkes, 1996; Helsen, Starkes, & Hodges, 1998; Benguigui & Ripoll, 1998), or physical attributes such as muscular strength or perceptual ability [Baxter-Jones et al. (1995); Abernathy (1990, 1991); Paull & Glencross (1997); for a review see Singer & Janelle (1999)]. Investigating psychological antecedents of sporting prowess is further supported by findings emphasising the importance of psychological processes for the uptake and maintenance of physical activity (e.g. Godin, 1994; Hausenblas, Carron, & Mack, 1997; Poulton, Trevena, Reeder, & Richards, 2002). Sporting achievement is also of interest as an outcome because of its association with health and fitness in young people (NIH, 1996; US Department of Health and Human Services, 1996) and because of the premium placed on these skills in many developed countries (e.g. Ministerial Task Force, 2001).

2. Materials and methods

2.1. Participants

Participants were members of the Dunedin Multidisciplinary Health and Development Study, a longitudinal investigation of health and behaviour in a complete birth cohort (Silva & Stanton, 1996). The Study members were born in Dunedin, in the province of Otago (pop. 187 500, Jan 2000 estimate, Stats NZ), New Zealand between April 1972 and March 1973. Of these, 1037 children (91% of eligible births; 52% male) participated in the first follow-up assessment at age 3, constituting the base sample for the remainder of the study. Follow-ups have been carried out at ages 5, 7, 9, 11, 13, 15, 18, 21 and most recently at age 26.

2.2. Measures

2.2.1. Fearfulness

At ages 5, 7, 9 and 11, the Study member's teacher and one parent (usually the mother) completed the Worry-Fearful subscale of the Rutter Child Behaviour Scales (Rutter, Tizard, & Whitmore, 1970). This scale contains five items, each scored on a three-point scale (0=does not apply, 1=applies somewhat, 2=certainly applies) including: Often worried, worries about many things', Tends to be on own — rather solitary', Often appears miserable, unhappy, tearful or distressed', Tends to be fearful or afraid of new things or new situations', and Fussy or over-particular child'. Scores for these items were summed separately at each age for both the teacher and the parent, and these summed scores were then averaged to form an average fearfulness rating for each Study member across ages 5–11 years. Study members were then grouped into quartiles in terms of their fearfulness rating.

2.2.2. Sporting representation

For most sports in New Zealand, the structure is three tiered:

1. players initially join and represent a sporting club or, at younger ages, play sport for their school;
2. the best players in club or school competition are then selected to represent their province; and
3. the best players in provincial competition are then selected to represent New Zealand.

With this structure in mind, we asked study members at age 26 whether they had represented their province at sport, which sport and at what ages? Study members were considered sporting reps at any level if they represented their province at sport since age 13. Study members were considered senior sporting reps if they had represented their province at senior (i.e. non-age group) level. Sporting reps were also subgrouped according to whether they represented their province in team (e.g. rugby, soccer, netball) or individual (e.g. athletics, badminton, tennis) sports. As most study members had lived most of their lives in the province of Otago, provincial representation in this sample typically meant representing Otago.

2.2.3. Statistical analysis

Logistic regression analyses were used to test the hypothesis that low levels of fear predicts sporting representation. Six dichotomous sporting representation outcomes were tested: representation in any sport at any level (yes/no), in any sport at senior level (yes/no), in team sport at any level (yes/no), in team sport at senior level (yes/no), in individual sport at any level (yes/no), and in individual sport at senior level (yes/no). For analyses with representation at senior level as the outcome, those who had represented their province at below-senior level were excluded from analyses. In the regression models, gender was used as a control and the high fear group was the contrast group for the fearfulness variable. Unless otherwise stated, findings reported hold for both sporting representation at any level and senior sporting representation. Effects were considered statistically significant if $p<0.05$.

3. Results

Data for both childhood fearfulness and age-26 sporting representation was available for 941 study members (92% of the 1019 still alive at age 26). Of these, 245 (26%) had represented their province at any level, 157 (17%) in team sports and 129 (14%) in individual sports (some individuals reported both types of representation). One hundred and nine (11%) study members had represented their province at senior level, 65 (7%) in team sports and 64 (7%) in individual sports.

Sporting representation showed a negative graded relation with childhood fearfulness (Table 1(a)): As fearfulness increased, the proportion who went on to represent their province decreased. The association between low levels of fearfulness and sporting representation was significant after controlling for gender: children with low levels of fearfulness were about twice as likely as those with high levels of fearfulness to be sporting reps.

Representation in team sports showed a similar graded negative relation with childhood fearfulness (Table 1(b)). As fearfulness increased, the proportion who went on to represent their province

Table 1
Provincial sporting representation at age 26 according to fearfulness ratings averaged across ages 5, 7, 9 and 11, adjusted for gender

	Childhood fearfulness quartiles: percentages (adjusted for gender)				Effect of childhood fearfulness		
	Low	Mid-low	Mid-high	High	Low OR (95% CI)	Mid-low OR (95% CI)	Mid-high OR (95% CI)
(a) Representation in any sport							
Any level (*N*=941)	34.8	25.2	22.7	19.7	2.18*** (1.41–3.36)	1.37 (0.89–2.11)	1.19 (0.76–1.87)
Senior level (*N*=805)[a]	18.6	11.2	13.3	9.6	2.15* (1.18–3.91)	1.19 (0.64–2.23)	1.44 (0.79–2.64)
(b) Representation in team sports only							
Any level (*N*=941)	24.3	15.8	13.6	9.3	3.15*** (1.83–5.40)	1.84* (1.06–3.21)	1.55 (0.87–2.74)
Senior level (*N*=849)[a]	10.9	5.8	8.2	3.9	2.99** (1.33–6.70)	1.50 (0.63–3.55)	2.18† (0.97–4.92)
(c) Representation in individual sports only							
Any level (*N*=941)	16.9	12.3	12.7	12.9	1.37 (0.81–2.33)	0.95 (0.56–1.63)	0.99 (0.58–1.70)
Senior level (*N*=876)[a]	10.0	6.1	6.5	6.1	1.70 (0.82–3.50)	0.99 (0.46–2.15)	1.06 (0.49–2.29)

[a] those who represented their province at below senior level were excluded from analyses.
† Differs from high fear group at $p<0.10$.
* Differs from high fear group at $p<0.05$.
** Differs from high fear group at $p<0.01$.
*** Differs from high fear group at $p<0.001$.

at team sports decreased. There was also a significant association between low levels of fearfulness and team sporting representation: children with low levels of fearfulness were about three times as likely as those with high levels of fearfulness to be team sporting reps. Having moderate levels of fearfulness in childhood also conferred a slight advantage in terms of team sporting representation at any level: those with mid-low fearfulness were almost twice as likely than those with high fearfulness to be team sporting reps.

There was no graded relation between individual sporting representation and childhood fearfulness (Table 1(c)). Similarly, there was no significant association between low levels of fearfulness and individual sporting representation.

4. Discussion

In many economically developed societies sport is a major preoccupation, presumably because of its association with physical health and fitness (e.g. NIH, 1996; US Department of Health and

Human Services, 1996) but also because it appears to be related in complex ways to national pride and identity (e.g., West, Reeder, Milne, & Poulton, 2002; Ministerial Task Force, 2001). Hence, understanding the combination of factors that result in sporting success is of interest to a broad range of groups including sport fans, governments, health policy makers, as well as coaches and sportsmen and -women.

Previous studies of sporting prowess have tended to focus on physical attributes and to a lesser extent on personality attributes of high level sports performers (Singer & Janelle, 1999; Vealey, 1992). Furthermore, most previous studies have been cross-sectional and only studied proximal determinants (e.g. level or intensity of training) of sporting performance (Ericsson & Charness, 1994; Hodges & Starkes, 1996; Helsen et al., 1998; Benguigui & Ripoll, 1998; Singer & Janelle, 1999). To our knowledge, no study has attempted to examine the influence of individual differences in levels of fear for this outcome, and none have done so from a longitudinal perspective.

Finding that lower levels of fear were associated with greater levels of team sporting achievement is notable for several reasons. First this relation appears robust both in terms of the dose–response relation observed for representative team sports and also with regard to the length of time over which the relation held (i.e. up to 15 years). Second, the findings suggest that potential for elite sporting achievement may be detectable at a relatively young age, at least as far as one particular psychological attribute is concerned, and this may be of interest to talent scouts when selecting sporting aspirants for intensive training. Third, with respect to public health campaigns aimed at increasing levels of physical activity in the general population, it seems that among children at least, general levels of fearfulness and anxiety may need to be taken into account when encouraging involvement in sport. This is because participation in sporting activities and commitment to a physically active lifestyle is likely to be strengthened by sporting success. Fourth, the findings are of interest from a theoretical perspective, inasmuch as an evolutionary model of fear and anxiety implies both negative and positive consequences of variations in levels of a particular trait in the population (Stearns, 1999; Trevathan et al., 1999).

While low fear may result in greater exposure to certain types of injury (Poulton et al., 1998; Marks & Nesse, 1994; Nesse, 1999; 2001), it also appears to convey some advantages, specifically in sporting arena. Furthermore, it appears that the team versus individual sport distinction moderates the relation between low levels of fear and later sports performance. It is unclear why this might occur. It is tempting to speculate that team sports, where one has obligations not only to self but also to others, may at times promote high levels of fear/anxiety capable of hindering performance in most participants, except among those who have had low levels of fear from a young age. Also, it is unclear if low-fear as defined in this study is synonymous with courage (cf. Rachman, 1990). Unfortunately, we did not measure courage on multiple occasions during childhood in our cohort so we are not able to address this question. Future work will attempt to develop a model capable of predicting elite sports performance that takes account of fear/anxiety levels as well as other physical and psychological abilities/attributes and socioeconomic factors.

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