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# Physical health correlates of overprediction of physical discomfort during exercise

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## Abstract

This study sought to determine if overprediction of physical discomfort prior to and following exercise was related to a number of self-report and objective measures of physical health status in a general population sample. Cross-sectional findings indicated a significant and specific relation between patterns of discomfort overprediction (vs under- or accurate prediction) and negative self-reported health status and attitudes to exercise, lower levels of physical activity, as well as poorer scores for resting heart rate, cardiorespiratory fitness and body mass index (but not waist:hip ratio). Females were more likely to overpredict discomfort, were less active and had poorer physical health than males. The potential usefulness of the prediction match–mismatch paradigm for studying exercise-related appraisal processes as proximal determinants of physical activity are discussed. Information obtained from such studies could prove useful in public health education campaigns aimed at increasing levels of physical activity in the general population, particularly among the less active. © 2002 Elsevier Science Ltd. All rights reserved.

*Keywords:* Physical activity; Cognition; Overprediction; Health; Longitudinal; Exercise

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## 1. Introduction

The benefits of physical activity include better physical and mental health, a reduced risk of premature death and enhanced quality of life (e.g., Bouchard, 2000; Fentem, 1996; Blair & Brodney, 1999). As noted by the US Surgeon General (US Department of Health and Human Services,

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1996), however, a significant proportion of the general population do not meet recommended levels of physical activity. Low levels of activity and increasing levels of obesity in both developed and developing countries are now major public health concerns (e.g., World Health Organisation, 1998; Flegal, Carroll, Kuczmarski, & Johnson, 1998; NIH, 1996) and the promotion of physical activity has become an important goal for both health professionals and policy makers (e.g., Grundy et al., 1999).

In this context, understanding the factors that influence initiation and maintenance of participation in physical activity is particularly relevant (Snell & Mitchell, 1999). The dynamic nature of physical activity acquisition has led to the examination of 'stages' through which individuals progress when moving from inactivity to regular participation (Hausenblas, Carron, & Mack, 1997; Godin, 1994; Prochaska & Marcus, 1994; Marcus & Simkin, 1993). Assessment of cognitive structures within the framework of 'stages' has identified important differences between those in each stage, for example, lower self-efficacy and a greater emphasis placed on the negative aspects of activity among the inactive (Gorely & Gordon, 1995). However, comparatively less attention has been paid to cognitive appraisal processes operating immediately prior to, during and following exercise (e.g., Wing & Jakicic, 2000). The role of expectation or predictions of physical discomfort in determining levels of physical activity (and its correlates e.g., fitness) are likely to be important, especially as a relationship between pain and avoidance behaviour has been reported (Philips, 1987) and overpredictions of pain are associated with avoidance (e.g., Rachman & Lopatka, 1988). Further, it appears that inaccurate predictions result in specific readjustments, which may also have long term behavioural consequences (Rachman & Arntz, 1991).

These findings highlight the potential value of studying individual differences in predictions of activity-related discomfort. Accordingly, we examined the relation between prediction of physical discomfort (prior to and following exercise conducted in a controlled setting) and a number of physical (objective) and self-reported (subjective) health parameters. Health measures included cardiorespiratory fitness, body mass index (BMI), waist:hip ratio as well as self-reported physical activity levels, general health status, and attitudes to physical activity. Since sex differences are commonly found for many of these physical health measures, sex effects were also examined.

## 2. Method

### 2.1. *Participants and general procedure*

Participants were members of the Dunedin Multidisciplinary Health and Development Study, a longitudinal investigation of the health, attitudes and behaviour of 1037 children (52% male, 48% female) born in Dunedin New Zealand, between April 1972 and March 1973 (Silva & Stanton, 1996). Following collection of perinatal data, regular assessments have been conducted every 2 years between ages 3 and 15 years, again at ages 18 and 21 and most recently at age 26 years ( $n=980$ ; 96% of living cohort members, 499 males). During that assessment phase, conducted in 1998–99, study members spent a full day at the Research Unit for confidential interviews and examinations. Typically, this occurred within 3 months of their 26th birthdays. Cohort families represent the full range of socio-economic status in the general population of New Zealand's

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