



## Sports participation and happiness: Evidence from US microdata

Haifang Huang<sup>1</sup>, Brad R. Humphreys\*

University of Alberta, Department of Economics, 8-14 Tory, Edmonton, AB, Canada T6G 2H4

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### ABSTRACT

We investigate the relationship between participation in physical activity and self reported happiness in the United States. IV estimates based on data from the Behavioral Risk Factor Surveillance System between 2005 and 2009 and County Business Patterns indicate that individuals living in a county with greater access to sports facilities are more likely to participate in physical activity and also report higher life satisfaction. Both men and women gain happiness from participation, and men appear to benefit more from participation than women.

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### 1. Introduction

How does participation in physical activity benefit society? Policy makers around the world have implemented programs to increase participation in physical activity in order to promote health, fight rising obesity, deter crime, impart important life skills on youth, and achieve other important societal goals over the past few decades (Schoppe, Bauman, & Bull, 2004). This wide scale adoption of policies aimed at increasing participation in physical activity and the broad range of outcomes from these interventions highlights the importance of physical activity in modern society. In this paper, we address a related question that has received relatively little attention to date: does participation in physical activity enhance quality of life? Some previous research hints at an answer. Physical activity, exercise and sport have been identified as a cause of joy.<sup>2</sup> Experiments on American and Italian teenagers showed they tended to be the happiest when engaging in sports and games (Csikszentmihalyi & Wong, 1991, chap. 10).<sup>3</sup> Does the happiness generated from participation in physical activity extend beyond the duration of the activity? There are good reasons to expect it does, since physical activity promotes health, which is important for a happier life. Furthermore, participation in physical activity like sport or exercise provides opportunities for

\* Corresponding author. Tel.: +1 780 492 5143.

E-mail addresses: [haifang.huang@ualberta.ca](mailto:haifang.huang@ualberta.ca) (H. Huang), [brad.humphreys@ualberta.ca](mailto:brad.humphreys@ualberta.ca) (B.R. Humphreys).

<sup>1</sup> Tel.: +1 780 492 1323.

<sup>2</sup> For example, Argyle and Martin (1991, chap. 5) list “Physical activity, exercise, sport” as one of the seven main causes of joy.

<sup>3</sup> The measurement of happiness in Csikszentmihalyi and Wong (1991) is “based on repeated self-reports of happiness that each respondent provides eight times each day, whenever signaled by an electronic pager, for one week.”

socialization and helps develop communication and cooperation skills, all of which may lead to a more fruitful life. It is thus possible that participating in physical activity produces not just transitory, but long-lasting happiness.

Prior research using micro-level data suggests a positive correlation between participating in physical activity and sports and self-reported quality of life (Fox, 1999). The interpretation of this correlative relationship, however, is not straightforward: individuals choose to participate in physical activity; those who choose to do so may be naturally healthier, more active and sociable, and therefore happier even without participating in physical activity. It is difficult to firmly establish a causal link between participation in physical activity and quality of life using micro-level data. One way to overcome this problem is to combine micro-level data with information describing the proximal environment surrounding individuals in a sample of data. Differences in factors such as access to facilities where exercise, physical activity, and sport participation occur and peer influence may affect participation in physical activity and, in turn, affect happiness. If there is no reason to suspect a causal link between the presence of nearby sport and exercise facilities and self reported well-being, and these two factors exhibit statistical correlation, then the correlation likely arises through participation in sport and physical activity. Some existing research has taken this approach. One example is Forrest and McHale's (2009) analysis of participation in physical activity and happiness in British adults. The factor they exploit is proximity to a sports or fitness facility, defined as the ability to travel to such a facility from home in 20 min or less. They find that British females who have such access are more likely to participate in sports, and report a higher level of happiness.

In this paper, we adopt a similar approach and apply it to microdata from the US. We focus on two research questions: does participating in physical activity lead to a higher reported quality of life, and if so, what mechanisms convey this effect? We combine data from a nationally representative survey of individual Americans with a data set that describes the local access to sports and fitness facilities in US counties. We use the Centers for Disease Control and Prevention's (CDCs) Behavioral Risk Factor Surveillance System (BRFSS) survey data for the years 2005 through 2009 as the primary source of data on self-reported life satisfaction. In these five years, the BRFSS sampled two million respondents and the survey contained questions on both self-reported life satisfaction and information on participation in physical activity and exercise. The factor we exploit to establish a causal relationship between participation in physical activity and happiness is the number of fitness and sports facilities and instruction providers per person in the county of residence. We collected data on the number of fitness and sports establishments and instruction providers from the US County Business Patterns data and merged this with the BRFSS survey data using geographic descriptors contained in both data sets. The combined data set has a usable sample of 1.6 million individuals living in 2346 US counties. There are large differences in the number of establishments per person across counties in the sample, ranging from zero to 1.6 per thousand residents. Such differences in the availability of fitness and sports facilities likely reflect differences in residents' demographic characteristics and economic conditions, the local sports culture, and government provision of infrastructure for participating in sports and physical activity. We posit that, for individuals with similar demographic backgrounds and income, these differences, either in terms of access to facilities or in peer influence, are related to individuals' decisions to participate in physical activity and unrelated to unobservable factors affecting self reported well-being; thus the number of local facilities can be used as an instrument to explain observed individual participation in physical activity to analyze the causal relationship between sport participation and self-reported happiness. Our empirical models also include an extensive list of demographic and personal control variables, as well as county level characteristics.

Our results show that individuals, despite having similar demographic and personal backgrounds, participate more actively in sports and physical activity if they live in counties that have a larger number of fitness and sports facilities per resident. These physically active individuals also report higher levels of life satisfaction. Since the number of sports establishments is unlikely to affect well-being directly, we interpret the influence on well-being as due to participation in physical activity.

The second research question addresses the mechanism through which participation in sports and physical activity affects self reported well-being. We find that the number of fitness and sports facilities in a county is significantly correlated with individuals' self-reported health status in the BRFSS after controlling for demographic characteristics, income and other factors. Based on this result, we interpret causation as running from participation in physical activity to health. Since self-reported health status has been consistently found to be a strong correlate of subjective well-being (Helliwell, 2003), we interpret the evidence as suggesting that part of the well-being benefit from participation in physical activity arises from the latter's ability to promote physical health, or at least the feeling of being healthy.

## 2. Evidence on physical activity and happiness

Research on happiness has exploded in recent years, especially in psychology and economics. Despite this increased research, little attention has been given to the relationship between participation in physical activity and happiness. A large literature indicating that participation in physical activity has a positive effect on mental well being exists; Fox (1999) surveyed this literature and found that exercise improves mental well-being through improved mood and self perception and is an effective treatment for clinical depression and anxiety. If exercise enhances mental well-being and mitigates the effects of depression and anxiety, then it could also affect happiness.

Economists have recently begun to explore the economic determinants of happiness, proceeding from the central role of utility, a concept closely related to happiness. Frey and Stutzer (2002) reviewed the literature and elaborates on areas where economists can learn from happiness research. A recent review, Dolan, Peasgood, and White (2008), identified the effect of

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