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Application of multi-level analyses in analysing sport participation

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Background

Sport participation is chiefly seen to be determined by demand-side factors such as the average income or age of a specific population under research. However, supply-side factors such as the availability of sport facilities and sport programmes can play a vital role in this regard. Since demand-side factors can be regarded as micro-level determinants and supply-side factors can be viewed on the macro-level, a methodological challenge is evident when analysing the two hierarchical levels at the same time. Multi-level analyses are a relatively new method of analysis and represent the most suitable approach for analysing hierarchical data since this data must be measured at the appropriate level (Osborne, 2000). In multi-level analyses interdependent regression models are estimated simultaneously. Conventional regression analyses cannot capture the hierarchical structure of the data. Therefore, the application of multi-level analyses is strongly recommended in case of hierarchical data (Osborne, 2000). The theoretical multi-level model for sport participation is based on the economical behaviour theory (Becker, 1965). On the demand side, income, the time budget at one's disposal, and human capital are considered important to sport participation. In addition to these household economic factors, sport participation can be restricted by the demand-specific factors age, migration background and gender. Sport supply implies sport facilities (*common* and *uncommon*) and sport programmes (offered by non-profit sport clubs, commercial sport providers, and the municipality). The influence of demand-side factors on sport participation has been extensively researched (e.g., Downward, Dawson, & Dejonghe, 2009), whereas the impact of supply-side factors is still under-researched (e.g., Chad et al., 2005).

Objectives

This paper aims to establish that the use of multi-level analyses is the suitable statistical approach when analysing hierarchical data on sport participation. Empirical evidence of both demand-side and supply-side determinants of sport participation using multi-level analyses will be provided.

Methods

A survey among the resident population in the city of Munich was carried out in 2008 (n = 11,715) by means of a computer-assisted telephone interview. Furthermore, secondary data on the available sport supply (sport facilities and sport programmes) in every urban district of Munich (n = 25) was collected. The demand-side and supply-side data sets were linked by the

key variable urban district. Two multi-level models were estimated for the dependent variables sport activity and sport activity in non-profit sport clubs.

Results

The results show that aside of demand-side factors, the supply of swimming pools and parks are especially important to residents' sport activity. Moreover, sport activity in non-profit sport clubs can be enhanced by both a good supply of programmes offered by sport clubs, as well as by a bad supply of programmes from commercial providers and from the municipality. On the demand side, the factors income, human capital, working time, age, and migration background influence sport activity significantly, whereas age and migration background have a negative impact.

Conclusion

The results depicted that both demand-side and supply-side factors are determinants of sport participation. This highlights the usefulness of multi-level analyses as they can be said to successfully capture the interplay of demand-side and supply-side factors. For communities it is recommended to invest in the construction of swimming pools and parks. Moreover, substitution effects were visible with regard to sport programmes in the city of Munich. As an example, sport programmes offered by the municipality decrease sport participation in non-profit sport clubs and should consequently not be over-supplied if the municipality aims to increase club participation.

References

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