Erasmus University Rotterdam
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Master Thesis Business Analytics and Quantitative Marketing

Proposal Master Thesis

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The impact of Physical Activity (PA) on mental wellbeing has been studied extensively in recent literature, both in empirical studies (Noetel et al., 2024; Mahindru, Patil & Agrawal, 2023), and through mechanistic arguments (Smith & Merwin, 2021). However, while cross-sectional studies consistently find a strong association between the two, Chekroud et al. (2018) note that the causal effect of PA on mental health as studied in randomised control trials has been inconsistent. As such, only tentative conclusions have been drawn, claiming PA "is probably [beneficial] for psychiatric diseases" (Peluso & De Andrade, 2005), "hold(s) promise in the treatment [...] of mental health conditions" (Smith & Merwin, 2021), et cetera.

I posit that longitudinal observational studies to date have not been powered to draw conclusions about the causal effect of PA on mental health in part because they have not explicitly modelled the reverse effect, namely that individuals with poor mental health are less likely to engage in PA. Azevedo Da Silva et al. (2012) and Jerstad, Boutelle, Ness and Stice (2010) find empirical evidence for this reverse relationship, though other work is inconclusive (Birkeland, Torsheim & Wold, 2009; Ku, Fox, Chen & Chou, 2012). Nevertheless, combined with the mechanistic argument that exercise increases self-efficacy (Smith & Merwin, 2021), the assumption that engagement in PA is not influenced by mental health seems tenuous at best. A violation of this assumption leads to endogeneity when regressing mental health on PA and therethrough to inconsistent estimation of the causal effect, a fact that is often neglected in longitudinal research (Leszczensky & Wolbring, 2022).

Definition of the problem/question. What constitutes the problem? Which aspects are important?

Relevance: Why and for whom is the research interesting and relevant? Is it of scientific relevance, and/or is it of interest for practical applications?

Literature: What kind of results have been obtained in previous research on this topic? How does the research relate to the existing literature?

Motivation: Why is the research necessary? Why is the existing knowledge on this topic insufficient? How will the research address these issues?

Methods: Which (econometric) methods and techniques will be applied in your research? Why are the methods appropriate here?

Data: What kind of data are needed and available for the research?

Time frame

[TODO]

References

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