Interdependence and Helping Behaviour: A Longitudinal Analysis

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This document reports the longitudinal analyses estimating the causal effect of perceived fitness interdependence on helping behaviour.

Sample

We tested the longitudinal relationship between perceived fitness interdependence and helping behaviour in a sample of 915 participants from the United States, sampled over 18 time points between 2020 and 2022.

Variables

The key outcome variable of interest is the amount of help given to others. This is a composite variable of six items measured on a 1-5 Likert scale at all time points except time points 14, 16, and 17. The individual items are:

- Giving money to someone you know who needs it (e.g., for rent, utilities, etc)
- Providing food or water e.g., meals, groceries
- Providing household supplies (e.g., medical, cleaning, etc)
- Providing help to someone who was sick, or injured
- Providing help with child or dependent care
- Providing emotional support

The key predictor of interest is perceived fitness interdependence, particularly the shared fate component of the scale. We focused on the neighbourhood level rather than the country level in order to match the helping items. This is a composite variable of three items measured on a 1-7 Likert scale at all time points. The individual items are:

- I feel that my neighborhood's gains are my gains
- What is good for my neighborhood is good for me
- My neighborhood and I rise and fall together

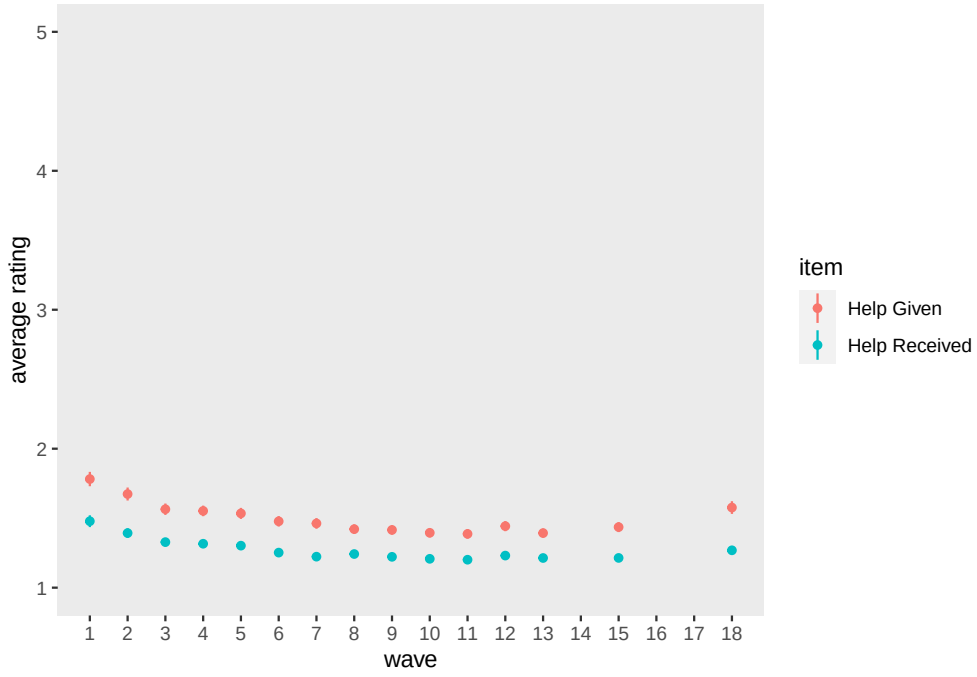
As additional control variables, we include:

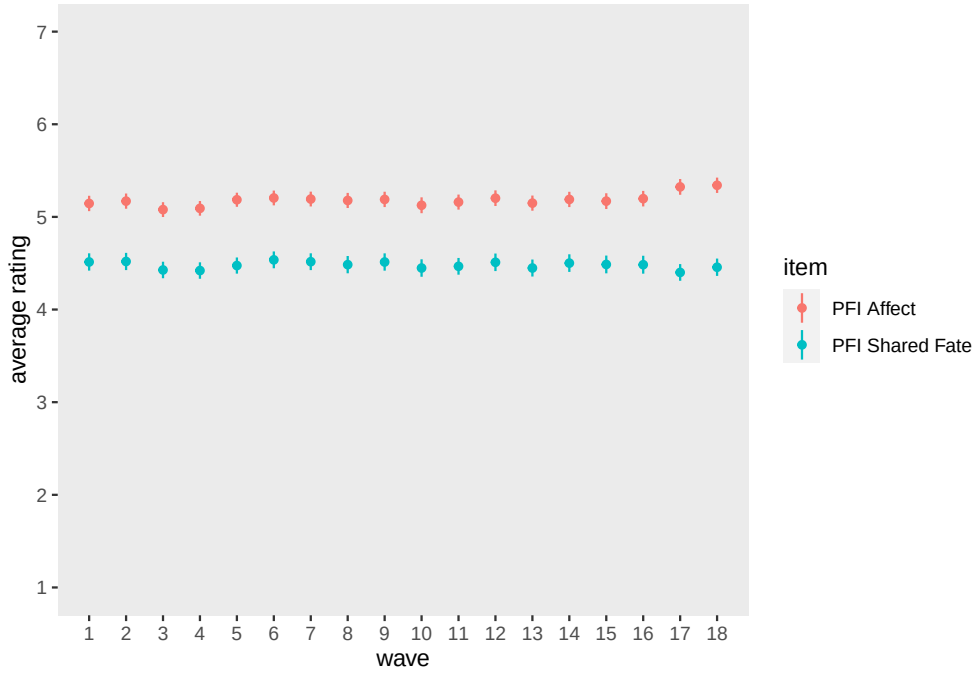
- the amount of help received (similar items as above but receiving instead of giving; 1-5 Likert scale; measured at all time points except time points 14, 16, and 17)
- wealth (composite of income, savings, and assets; measured at first time point)
- trait empathic concern (composite of six items; 1-5 Likert scale; measured at first time point)

We did not include personality measures (e.g., agreeableness) as there was too much missing data.

Data visualisation

We can plot averages of helping behaviour and perceived fitness interdependence over the course of the study period.





Longitudinal modelling

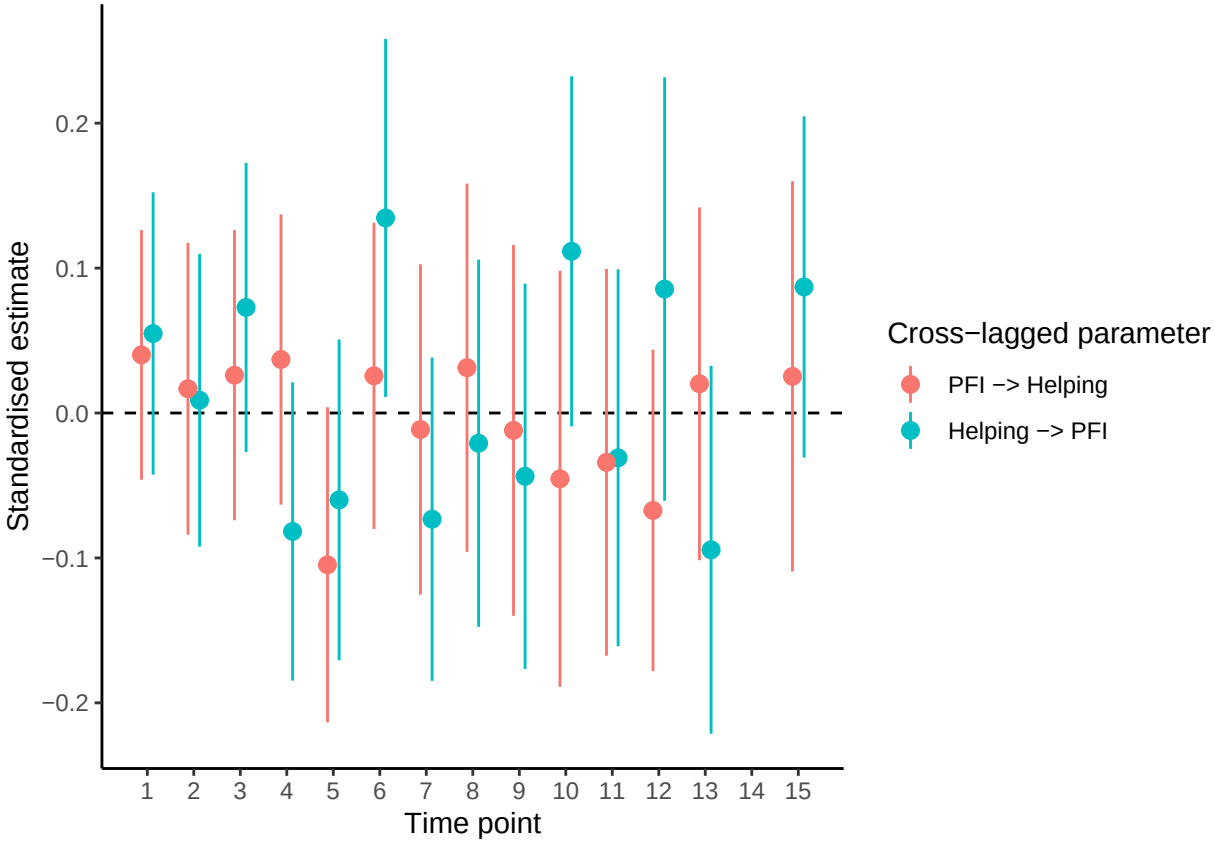
We used random-intercept cross-lagged panel modelling to estimate the longitudinal causal effect of perceived fitness interdependence on helping behaviour. This model asks whether increases above average levels of the predictor variable predict future increases above average levels of the outcome variable at the next time point.

Model without controls

Initially, we included only perceived fitness interdependence and helping behaviour, without any additional controls. We included these variables at all time points except 14, 16, and 17, because helping behaviour was not measured at those time points.

We first fitted a constrained model, which assumes that the autoregressive and cross-lagged effects are identical across waves. This model found that within-person increases in perceived fitness interdependence predicted future within-person increases in the same variable (β = 0.13, b = 0.10, 95% CI [0.07 0.13], p < .001). Within-person increases in helping behaviour also predicted future within-person increases in the same variable (β = 0.21, b = 0.15, 95% CI [0.11 0.18], p < .001). However, there were no cross-lagged effects: perceived fitness interdependence did not predict future helping behaviour (β = 0.01, b = 0.00, 95% CI [-0.01 0.02], p = .604) nor did helping behaviour predict future perceived fitness interdependence (β = 0.02, b = 0.02, 95% CI [-0.04 0.08], p = .440).

We then fitted an unconstrained model that estimated different autoregressive and cross-lagged effects at each time point. This model found only one cross-lagged effect across the whole study period, from helping behaviour to future perceived fitness interdependence in time point 6. There were no cross-lagged effects from interdependence to future helping behaviour.



Model including controls

In a second set of models, we included several time-varying and time-invariant covariates to control for confounding. We added amount of help received as a time-varying covariate. We also added wealth and trait empathic concern as time-invariant covariates.

The results of the constrained model with controls were the same as the model without controls. This model found that within-person increases in perceived fitness interdependence predicted future within-person increases in the same variable (β = 0.12, b = 0.10, 95% CI [0.07 0.13], $p < .001$). Within-person increases in helping behaviour also predicted future within-person increases in the same variable (β = 0.20, b = 0.15, 95% CI [0.11 0.18], $p < .001$). However, there were no cross-lagged effects: perceived fitness interdependence did not predict future helping behaviour (β = -0.01, b = 0.00, 95% CI [-0.02 0.01], $p = .567$) nor did helping behaviour predict future perceived fitness interdependence (β = 0.01, b = 0.02, 95% CI [-0.05 0.09], $p = .590$).

Results from the unconstrained were also unchanged, finding no cross-lagged effects from interdependence to future helping behaviour.